



Ref. Certif. No.

DK-152793-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product

Switching Power Supply

Name and address of the applicant

OmniOn Power (China) Co., Ltd.
1F, Bldg 58, 461 Hongcao Rd
Xuhui District Shanghai 200233
China

Name and address of the manufacturer

ABB Power Electronics Inc
601 SHILOH RD PLANO, TX 75074-7210
United States

Name and address of the factory

OmniOn Power Shanghai Co., Ltd.
NO 1353 CHEN QIAO RD
SHANGHAI FENGPU INDUSTRIAL PARK SHANGHAI, 201401
China

Note: When more than one factory, please report on page 2

☐ [Additional Information on page 2](#)

Ratings and principal characteristics

Input rating: 200-240 Vac(or 100-240 Vac), 16 A , 47-63 Hz(or 50/60 Hz)

☒ [Additional Information on page 2](#)

Trademark / Brand (if any)

OmniOn Power



Customer's Testing Facility (CTF) Stage used

Model / Type Ref.

CAR2548FP, CAR2548TN

☒ [Additional Information on page 2](#)

Additional information (if necessary may also be reported on page 2)

Additionally evaluated to:

EN IEC 62368-1:2020, EN IEC 62368-1:2020/A11:2020

National Differences: AU, CA, EU Group Differences, JP, NZ, US

☐ [Additional Information on page 2](#)

A sample of the product was tested and found to be in conformity with

IEC 62368-1:2018

As shown in the Test Report Ref. No. which forms part of this Certificate

E252413-A6007-CB-2 issued on 2024-05-05

This CB Test Certificate is issued by the National Certification Body



- ☐ UL Solutions (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
- ☒ UL Solutions (Denko), Borupvang 5A DK-2750 Ballerup, DENMARK
- ☐ UL Solutions (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
- ☐ UL Solutions (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2024-05-06

Signature:

Thomas Wilson



Ref. Certif. No.

DK-152793-UL

Additional Model Detail(s):

CAR2548FP, CAR2548TN, (may be optionally followed by "B", and/or "C", and/or "A", and/or "5", and/or "-Z" or "-Z01A", and/or "-Y" or "-Y01A", see test report for details.)

Additional Ratings:

Model CAR2548FP Series:

DC Output Ratings: 48 Vdc(or 48.5Vdc) at 52 A maximum,

Optional 3.3 Vsb at 1 A

or 5 Vsb at 1 A

Model CAR2548TN Series:

DC Output Ratings: -54 Vdc at 46.25 A maximum,

Optional 3.3 Vsb at 1 A

or 5 Vsb at 1 A

Maximum continuous output power not to exceed 2500 W with internal fan cooling at 50°C at input range of 180-264 Vac.

Maximum continuous output power not to exceed 1300 W with internal fan cooling at 50°C at input range of 90-180 Vac.

For CAR2548FP series, the 48V output can be rated up to 2% to include the tolerance, however the total output power remain the same as 2500W and 1300W.

Additional information (if necessary)



- ☐ UL Solutions (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
- ☒ UL Solutions (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
- ☐ UL Solutions (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
- ☐ UL Solutions (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2024-05-06

Signature:

Thomas Wilson



Test Report issued under the responsibility of:



TEST REPORT IEC 62368-1 Audio/video, information and communication technology equipment Part 1: Safety requirements	
Report Number	E252413-A6007-CB-2
Date of issue	2024-05-05
Total number of pages	90
Name of Testing Laboratory preparing the Report	UL-CCIC Company Limited
Applicant's name	OmniOn Power (China) Co., Ltd.
Address	1F, Bldg 58, 461 Hongcao Rd Xuhui District Shanghai 200233 CHINA
Test specification:	
Standard	IEC 62368-1: 2018
Test procedure.....	CB Scheme
Non-standard test method.....	N/A
TRF template used	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No.....	IEC62368_1E
Test Report Form(s) Originator....	UL(US)
Master TRF	Dated 2022-04-14
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General disclaimer: The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

Test Item Description	Switching Power Supply	
Trade Mark(s)	OmniOn Power or 	
Manufacturer	OmniOn Power Inc. 601 Shiloh Rd Plano TX 75074-7210 UNITED STATES	
Model/Type reference	CAR2548FP, CAR2548TN (may be optionally followed by "B", and/or "C", and/or "A", and/or "5", and/or "-Z" or "-Z01A", and/or "-Y" or "-Y01A", see general product information for model details)	
Ratings	Input rating: 200-240 Vac(or 100-240 Vac), 16 A , 47-63 Hz(or 50/60 Hz) Model CAR2548FP Series: DC Output Ratings: 48 Vdc(or 48.5Vdc) at 52 A maximum, Optional 3.3 Vsb at 1 A; or 5 Vsb at 1 A Model CAR2548TN Series: DC Output Ratings: -54 Vdc at 46.25 A maximum, Optional 3.3 Vsb at 1 A; or 5 Vsb at 1 A Maximum continuous output power not to exceed 2500 W with internal fan cooling at 50°C at input range of 180-264 Vac. Maximum continuous output power not to exceed 1300 W with internal fan cooling at 50°C at input range of 90-180 Vac. For CAR2548FP series, the 48V output can be rated up to 2% to include the tolerance; however the total output power remain the same as 2500W and 1300W.	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	CB Testing Laboratory:	
Testing location/ address	UL-CCIC Company Limited No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China	
Tested by (name, function, signature)..... :	Coco Zhu / Project Handler	

Approved by (name, function, signature) .. :		Jie Qian / Reviewer	
☐	Testing procedure: CTF Stage 1:		
Testing location/ address			
Tested by (name, function, signature)..... :			
Approved by (name, function, signature) .. :			
☐	Testing procedure: CTF Stage 2:		
Testing location/ address			
Tested by (name, function, signature)..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
☐	Testing procedure: CTF Stage 3:		
☐	Testing procedure: CTF Stage 4:		
Testing location/ address			
Tested by (name, function, signature)..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment):

National Differences (41 pages)

Enclosures (42 pages)

Summary of testing:**Tests performed (name of test and test clause):**5.2.2.1-5.2.2.6 – CLASSIFICATION OF
ELECTRICAL ENERGY SOURCES5.4.1.8 – DETERMINATION OF WORKING
VOLTAGE

5.4.1.10.3 – BALL PRESSURE TEST

5.4.9.1 – ELECTRIC STRENGTH TEST – TYPE
TESTING OF SOLID INSULATION5.5.2.2 – CAPACITOR DISCHARGE AFTER
DISCONNECTION OF A CONNECTOR5.6.6.2 – RESISTANCE OF THE PROTECTIVE
BONDING SYSTEM5.7.5 – TOUCH CURRENT MEASUREMENT –
EARTHED ACCESSIBLE CONDUCTIVE PARTS
– SINGLE-PHASE EQUIPMENT ON IT SYSTEM

B.2.5 – INPUT TEST: SINGLE PHASE

B.2.6, 5.4.1.4, 6.3, 9.3, B.1.5 – NORMAL
OPERATING CONDITIONS TEMPERATURE
MEASUREMENTB.3 – SIMULATED ABNORMAL OPERATING
CONDITIONS

B.4 – SIMULATED SINGLE FAULT CONDITIONS

G.5.3.3 – TRANSFORMER OVERLOAD

Testing Location:Unless otherwise noted, test are all conducted in
CBTL: UL-CCIC Company LimitedNo. 2, Chengwan Road, Suzhou Industrial Park,
Suzhou 215122, China**Summary of compliance with National Differences (List of countries addressed):**Australia - AU, New Zealand - NZ, EU Group Differences, Japan - JP, United States of America - US, Canada -
CA☒ **The product fulfils the requirements of** AS/NZS 62368.1:2022, J62368-1(2023), EN IEC 62368-
1:2020+A11:2020, CSA/UL 62368-1:2019

Use of uncertainty of measurement for decisions on conformity (decision rule) :

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE. IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

 OmniOn Power Inc. 601 Shiloh Road Plano, TX 75074, USA MODEL CAR2548TN INPUT: 200-240VAC 47-63Hz 16A	 OmniOn Power Inc. 601 Shiloh Road Plano, TX 75074, USA MODEL CAR2548FP INPUT: 200-240VAC 47-63Hz 16A
 OmniOn Power Inc. 601 Shiloh Road Plano, TX 75074, USA MODEL CAR2548TN INPUT: 100-240VAC 47-63Hz 16A	 OmniOn Power Inc. 601 Shiloh Road Plano, TX 75074, USA MODEL CAR2548FP INPUT: 100-240VAC 47-63Hz 16A

Note: The above markings are the minimum requirements required by the safety lab. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.

Test item particulars:	
Product group	--
Classification of use by	Instructed person
Supply Connection	AC Mains
Supply tolerance	+10%/-10%
Supply connection – type	Internal Connector suitable for disconnect
Considered current rating of protective device	30 A; Location: building
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II OVC II
Class of equipment	Class I
Special installation location	N/A 0
Pollution degree (PD)	PD 2
Manufacturer's specified Tma (°C)	50
IP protection class	IPX0
Power systems	TN
Altitude during operation (m)	4000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	2.18
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing:	
Date of receipt of test item	2020-01-22
Date (s) of performance of tests	2020-02-28
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60077-2:	

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided :	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : OmniOn Power Shanghai Co., Ltd. 1353 Chengqiao Road, Fengpu Industrial Park, 201401, Fengxian, Shanghai, P. R. CHINA	
General product information and other remarks:	
Product Description Component type power supply for built in, hot pluggable type input and output connection Power Supply Modules CAR2548FP and CAR2548TN , may be optionally followed by "B", and/or "C", and/or "A", and/or "5", and/or "-Z" or "-Z01A", and/or "-Y" or "-Y01A", where: "-Z" or "-Z01A" means option for RoHS version "-Y" or "-Y01A" means option for RoHS with Lead Free Exemption "B" means with optional Bezel "C" means "Digital i2c" option "A" means "controller Area Network (CAN) interface Bus" option "5" means "5Vsb/1A" option.	
Model Differences All models have similar design construction, except for the output ratings.	
Additional Information Reissue report - - This report is a reissue of CBTR Ref. No. E252413-A6007-CB-1 issued 2020-05-06, with CB Test Certificate Ref. No. DK-96731-UL, issued on 2020-05-06.. Based on the previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, has been determined that the product continues to comply with the standard. - This reissue report includes the following changes: Standard upgrade to third edition Change the applicant name to "OmniOn Power (China) Co., Ltd. " Change the manufacturer name to "OnmiOn Power Inc." Change the factory name to " OnmiOn Power Shanghai Co., Ltd." Change the trademark to "OmniOn Power" Update the Markingplate Update additional standards in GPI Update CCL Table 4.1.2	
Technical Considerations	

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of : 50°C
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply : +10%/-10%
- The Risk Group of a lamp or lamp system (including LEDs) is : Exempt
- According to IEC60664-1, required clearances have been adjusted by multiplying the clearance at sea level by a factor of 1.29 for operating at an altitude of 4000 meters. However, the Electric Strength Test should be conducted when installed in the end product application at 4000 meters.
- The unit is a hot pluggable type; therefore, Connector Current Interruption Test was performed to this unit with 200 cycles connect and disconnection under load.

Engineering Conditions of Acceptability

When installed in an end-product, consideration must be given to the following:

- The following product-line tests are conducted for this product : Earthing Continuity, Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-Secondary: 340 Vrms/795 Vpk, Primary – Earthed Dead Metal: 336 Vrms/735 Vpk
- The following output circuits are at ES1 energy levels : All outputs
- The following output circuits are at PS3 energy levels : All outputs
- The maximum investigated branch circuit rating is : 20 A
- The investigated Pollution Degree is : 2
- Proper bonding to the end-product main protective earthing termination is : Required
- The following end-product enclosures are required : Electrical, Fire
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C) : T2, T3 and T5 are Class H
- The equipment is suitable for direct connection to : AC mains supply
- The power supply was evaluated to be used at altitudes up to : 4000 m
- ANNEX R shall be evaluated in end-product.

OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	Possible Hazard			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES3: The circuit connected to AC mains	Ordinary	--	--	Enclosure See 5.4.2, 5.4.3, 5.5.3 and 5.5.4
ES3: C3, C6, C10, C80	Ordinary	--	--	See 5.5.2.2
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1 st S	2 nd S
PS3 circuit	PCB	See 6.3	V-1 or better	N/A
PS3 circuit	Plastic materials not part of PS3 circuit	See 6.3	V-2 or better	N/A
PS3 circuit	Internal/external wiring	N/A	N/A	See 6.5
PS3 circuit	The other components/materials	See 6.3	See 6.4.5, 6.4.6	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
	N/A			
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
	N/A(for building-in)			
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
	N/A(for building-in)			
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
	N/A			
Supplementary Information:				

“B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard

(1) See attached energy source diagram for additional details.

(2) “N” – Normal Condition; “A” – Abnormal Condition; “S” Single Fault

ENERGY SOURCE DIAGRAM

Optional. Manufacturers are to provide the energy sources diagram identify declared energy sources and identifying the demarcations are between power sources. Recommend diagram be provided included in power supply and multipart systems.

Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings

☐ ES ☐ PS ☐ MS ☐ TS ☐ RS

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		Pass
4.1.1	Acceptance of materials, components and subassemblies		Pass
4.1.2	Use of components		Pass
4.1.3	Equipment design and construction		Pass
4.1.4	Specified ambient temperature for outdoor use (°C) :		N/A
4.1.5	Constructions and components not specifically covered		N/A
4.1.8	Liquids and liquid filled components (LFC)	(See G.15)	N/A
4.1.15	Markings and instructions	Building-in equipment, to be evaluated in the end product	N/A
4.4.3	Safeguard robustness		N/A
4.4.3.1	General	Building-in equipment, to be evaluated in the end product	N/A
4.4.3.2	Steady force tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.3.3	Drop tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.3.4	Impact tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.3.5	Internal accessible safeguard tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.3.6	Glass impact tests	No glass	N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.3.9	Air comprising a safeguard	Building-in equipment, to be evaluated in the end product	N/A
4.4.3.10	Accessibility, glass, safeguard effectiveness	Building-in equipment, to be evaluated in the end product	N/A
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks	(See Annex K)	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.5	Explosion		N/A
4.5.1	General	(See Annex M for batteries)	N/A
4.5.2	No explosion during normal/abnormal operating condition	(See Clause B.2, B.3)	N/A
	No harm by explosion during single fault conditions	(See Clause B.4)	N/A
4.6	Fixing of conductors		N/A
	Fix conductors not to defeat a safeguard		N/A
	Compliance is checked by test..... :		N/A
4.7	Equipment for direct insertion into mains socket-outlets		N/A
4.7.2	Mains plug part complies with relevant standard .. :		N/A
4.7.3	Torque (Nm) :		N/A
4.8	Equipment containing coin/button cell batteries		N/A
4.8.1	General	No button cell battery	N/A
4.8.2	Instructional safeguard :		N/A
4.8.3	Battery compartment door/cover construction		N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	Likelihood of fire or shock due to entry of conductive object		N/A
4.10	Component requirements		N/A
4.10.1	Disconnect Device	(See Annex L)	N/A
4.10.2	Switches and relays	(See Annex G)	N/A
5	ELECTRICALLY-CAUSED INJURY		Pass
5.2	Classification and limits of electrical energy sources		Pass

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.2	ES1, ES2 and ES3 limits		Pass
5.2.2.2	Steady-state voltage and current limits	See appended table 5.2)	Pass
5.2.2.3	Capacitance limits	(See appended table 5.2)	Pass
5.2.2.4	Single pulse limits		N/A
5.2.2.5	Limits for repetitive pulses		N/A
5.2.2.6	Ringing signals		N/A
5.2.2.7	Audio signals		N/A
5.3	Protection against electrical energy sources		N/A
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		N/A
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits		N/A
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements		N/A
	Test with test probe from Annex V		—
5.3.2.2 a)	Air gap – electric strength test potential (V)	(See appended table 5.4.9)	N/A
5.3.2.2 b)	Air gap – distance (mm)		N/A
5.3.2.3	Compliance		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	Insulation materials and requirements		Pass
5.4.1.2	Properties of insulating material		Pass
5.4.1.3	Material is non-hygroscopic	(See sub-clause 5.4.8)	Pass
5.4.1.4	Maximum operating temperature for insulating materials	(See appended table 5.4.1.4)	Pass
5.4.1.5	Pollution degrees	PD 2	N/A
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling test		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.8	Determination of working voltage	(See appended table 5.4.1.8)	Pass
5.4.1.9	Insulating surfaces		N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		Pass
5.4.1.10.2	Vicat test.....		N/A
5.4.1.10.3	Ball pressure test	(See appended table 5.4.1.10.3)	Pass
5.4.2	Clearances		Pass
5.4.2.1	General requirements		N/A
	Clearances in circuits connected to AC Mains, Alternative method	(See Annex X)	N/A
5.4.2.2	Procedure 1 for determining clearance		Pass
	Temporary overvoltage		—
5.4.2.3	Procedure 2 for determining clearance		Pass
5.4.2.3.2.2	a.c. mains transient voltage	2500V	—
5.4.2.3.2.3	d.c. mains transient voltage	-	—
5.4.2.3.2.4	External circuit transient voltage.....	-	—
5.4.2.3.2.5	Transient voltage determined by measurement	-	—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test	(See appended table 5.4.2)	N/A
5.4.2.5	Multiplication factors for clearances and test voltages	1.29 for clearance	Pass
5.4.2.6	Clearance measurement	(See appended table 5.4.2)	Pass
5.4.3	Creepage distances	(See appended table 5.4.3)	Pass
5.4.3.1	General	(See appended table 5.4.3)	Pass
5.4.3.3	Material group	IIIb	—
5.4.3.4	Creepage distances measurement	(See appended table 5.4.3)	Pass
5.4.4	Solid insulation		Pass
5.4.4.1	General requirements		Pass
5.4.4.2	Minimum distance through insulation	No solid insulation used. Triple Insulated Wire used in transformer, tapes not used for insulation.	N/A
5.4.4.3	Insulating compound forming solid insulation		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.4	Solid insulation in semiconductor devices		Pass
5.4.4.5	Insulating compound forming cemented joints		N/A
5.4.4.6	Thin sheet material		Pass
5.4.4.6.1	General requirements		Pass
5.4.4.6.2	Separable thin sheet material		Pass
	Number of layers (pcs) :	Minimum 2 layers	Pass
5.4.4.6.3	Non-separable thin sheet material		N/A
	Number of layers (pcs) :		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material :		N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		Pass
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P , K_R , d , V_{PW} (V) :		N/A
	Alternative by electric strength test, tested voltage (V), K_R :	(See appended Tables 5.4.4.9 and 5.4.9)	N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance ($M\Omega$) :		N/A
	Electric strength test..... :	(See appended table 5.4.9)	N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		Pass
	Relative humidity (%), temperature (°C), duration (h)..... :	93% 40 120	—
5.4.9	Electric strength test	(See appended table 5.4.9)	Pass
5.4.9.1	Test procedure for type test of solid insulation..... :	(See appended table 5.4.9)	Pass
5.4.9.2	Test procedure for routine test	The routine tests shall be conducted by manufacturer during manufacturing	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.10	Safeguards against transient voltages from external circuits		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test		N/A
5.4.10.2.3	Steady-state test.....		N/A
5.4.10.3	Verification for insulation breakdown for impulse test		N/A
5.4.11	Separation between external circuits and earth		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V)		—
	Nominal voltage U_{peak} (V)		—
	Max increase due to variation ΔU_{sp}		—
	Max increase due to ageing ΔU_{sa}		—
5.4.11.3	Test method and compliance	(See appended table 5.4.9)	N/A
5.4.12	Insulating liquid		N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid	(See appended table 5.4.9)	N/A
5.4.12.3	Compatibility of an insulating liquid	(See appended table 5.4.9)	N/A
5.4.12.4	Container for insulating liquid		N/A
5.5	Components as safeguards		Pass
5.5.1	General		Pass
5.5.2	Capacitors and RC units	(See Annex G.11)	Pass
5.5.2.1	General requirement		Pass
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector	(See appended table 5.5.2.2)	Pass
5.5.3	Transformers	(See Annex G.5.3)	Pass
5.5.4	Optocouplers	R/C component used.	Pass

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.5	Relays	(See sub-clause 5.4)	N/A
5.5.6	Resistors	(See Clause G.10)	N/A
5.5.7	SPDs	(See Clause G.8)	Pass
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable	(See Clause G.10.3)	N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment		N/A
	RCD rated residual operating current (mA)		—
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation	To be evaluated by the end product	N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm ²)		—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm ²).	To be evaluated in the end product	—
5.6.4.2	Protective current rating (A)	To be evaluated in the end product	N/A
5.6.5	Terminals for protective conductors	To be evaluated in the end product	N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm)		N/A
	Terminal size for connecting protective bonding conductors (mm)		N/A
5.6.5.2	Corrosion	To be evaluated in the end product	N/A
5.6.6	Resistance of the protective bonding system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method	(See appended table 5.6.6)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.6.3	Resistance (Ω) or voltage drop..... :	(See appended table 5.6.6)	N/A
5.6.7	Reliable connection of a protective earthing conductor	To be evaluated in the end product	N/A
5.6.8	Functional earthing		N/A
	Conductor size (mm ²)..... :		N/A
	Class II with functional earthing marking :		N/A
	Appliance inlet cl & cr (mm) :		N/A
5.7	Prospective touch voltage, touch current and protective conductor current		Pass
5.7.2	Measuring devices and networks		Pass
5.7.2.1	Measurement of touch current	(See appended table 5.7.4)	Pass
5.7.2.2	Measurement of voltage		Pass
5.7.3	Equipment set-up, supply connections and earth connections		Pass
5.7.4	Unearthed accessible parts :	(See appended table 5.7.4)	N/A
5.7.5	Earthed accessible conductive parts :	(See appended table 5.7.5)	Pass
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA) :	(See appended Table 5.7.4)	N/A
	Instructional Safeguard..... :		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to earthed external circuits, current (mA)..... :		N/A
	b) Equipment connected to unearthed external circuits, current (mA)..... :		N/A
5.8	Backfeed safeguard in battery backed up supplies		N/A
	Mains terminal ES :	(See appended table 5.8)	N/A
	Air gap (mm)..... :		N/A
6	ELECTRICALLY- CAUSED FIRE		Pass

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Clause	Requirement + Test	Result - Remark	Verdict
6.2	Classification of PS and PIS		Pass
6.2.2	Power source circuit classifications	All circuits are considered as PS3	Pass
6.2.3	Classification of potential ignition sources		Pass
6.2.3.1	Arcing PIS	Contacts of connector are considered to be an arcing PIS	Pass
6.2.3.2	Resistive PIS	All components are considered as PIS in PS3 circuits	Pass
6.3	Safeguards against fire under normal operating and abnormal operating conditions		Pass
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials..... :	(See appended table B.1.5 and B.3)	Pass
	Combustible materials outside fire enclosure	Building-in equipment, to be evaluated in the end product	N/A
6.4	Safeguards against fire under single fault conditions		Pass
6.4.1	Safeguard method		Pass
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits	No supplementary safeguards are needed for protection against PS1	Pass
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	Method "reduce the likelihood of ignition" is not used	N/A
6.4.3.1	Supplementary safeguards		N/A
6.4.3.2	Single Fault Conditions..... :	(See appended table B.4)	N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		Pass
6.4.5	Control of fire spread in PS2 circuits		N/A
6.4.5.2	Supplementary safeguards		N/A
6.4.6	Control of fire spread in PS3 circuits		N/A
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers	Building-in equipment, to be evaluated in the end product	N/A
6.4.8.2	Fire enclosure and fire barrier material properties		N/A
6.4.8.2.1	Requirements for a fire barrier		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.8.2.2	Requirements for a fire enclosure		N/A
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N/A
6.4.8.3.1	Fire enclosure and fire barrier openings		N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top openings and properties		N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.4	Bottom openings and properties		N/A
	Openings dimensions (mm)..... :		N/A
	Flammability tests for the bottom of a fire enclosure	(See Clause S.3)	N/A
	Instructional Safeguard..... :		N/A
6.4.8.3.5	Side openings and properties		N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c)..... :		N/A
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating..... :		N/A
6.4.9	Flammability of insulating liquid..... :		N/A
6.5	Internal and external wiring		N/A
6.5.1	General requirements	External wire connected to this device shall be evaluated in the end product	N/A
6.5.2	Requirements for interconnection to building wiring..... :		N/A
6.5.3	Internal wiring size (mm ²) for socket-outlets..... :		N/A
6.6	Safeguards against fire due to the connection to additional equipment		Pass
7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		N/A
7.2	Reduction of exposure to hazardous substances		N/A
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards or personal protective equipment (PPE)		N/A
	Personal safeguards and instructions..... :		—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010)..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
7.6	Batteries and their protection circuits		N/A
8	MECHANICALLY-CAUSED INJURY		Pass
8.2	Mechanical energy source classifications		Pass
8.3	Safeguards against mechanical energy sources		N/A
8.4	Safeguards against parts with sharp edges and corners		N/A
8.4.1	Safeguards		N/A
	Instructional Safeguard		N/A
8.4.2	Sharp edges or corners		N/A
8.5	Safeguards against moving parts		N/A
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts	Fan blades was guarded by enclosure, can not be touched	N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard.....		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m)		N/A
	Space between end point and nearest fixed mechanical part (mm)		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts.....:		N/A
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N).....:		N/A
8.5.4.3.5	Compliance		N/A
8.5.5	High pressure lamps		N/A
	Explosion test.....:		N/A
8.5.5.3	Glass particles dimensions (mm).....:		N/A
8.6	Stability of equipment		N/A
8.6.1	General		N/A
	Instructional safeguard.....:		N/A
8.6.2	Static stability		N/A
8.6.2.2	Static stability test.....:		N/A
8.6.2.3	Downward force test		N/A
8.6.3	Relocation stability		N/A
	Wheels diameter (mm).....:		—
	Tilt test		N/A
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test.....:		N/A
8.7	Equipment mounted to wall, ceiling or other structure		N/A
8.7.1	Mount means type.....:		N/A
8.7.2	Test methods		N/A
	Test 1, additional downwards force (N).....:		N/A
	Test 2, number of attachment points and test force (N).....:		N/A
	Test 3 Nominal diameter (mm) and applied torque (Nm).....:		N/A
8.8	Handles strength		N/A
8.8.1	General		N/A
8.8.2	Handle strength test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Number of handles.....:		—
	Force applied (N)		—
8.9	Wheels or casters attachment requirements		N/A
8.9.2	Pull test		N/A
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions.....:		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N)		N/A
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N)		—
8.10.6	Thermoplastic temperature stability		N/A
8.11	Mounting means for slide-rail mounted equipment (SRME)		N/A
8.11.1	General		N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard.....:		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied.....:		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	Telescoping or rod antennas		N/A
	Button/ball diameter (mm)		—
9	THERMAL BURN INJURY		N/A
9.2	Thermal energy source classifications		N/A
9.3	Touch temperature limits		N/A
9.3.1	Touch temperatures of accessible parts	(See appended table)	N/A
9.3.2	Test method and compliance		N/A
9.4	Safeguards against thermal energy sources		N/A
9.5	Requirements for safeguards		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.5.1	Equipment safeguard		N/A
9.5.2	Instructional safeguard.....:		N/A
9.6	Requirements for wireless power transmitters		N/A
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance	(See appended table 9.6)	N/A
10	RADIATION		N/A
10.2	Radiation energy source classification		N/A
10.2.1	General classification		N/A
	Lasers		—
	Lamps and lamp systems		—
	Image projectors		—
	X-Ray		—
	Personal music player		—
10.3	Safeguards against laser radiation		N/A
	The standard(s) equipment containing laser(s) comply		N/A
10.4	Safeguards against optical radiation from lamps and lamp systems (including LED types)		N/A
10.4.1	General requirements		N/A
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for enclosures		N/A
	UV radiation exposure	(See Annex C)	N/A
10.4.3	Instructional safeguard		N/A
10.5	Safeguards against X-radiation		N/A
10.5.1	Requirements		N/A
	Instructional safeguard for skilled persons		—
10.5.3	Maximum radiation (pA/kg)	(See appended table B.3, B.4)	—

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Clause	Requirement + Test	Result - Remark	Verdict

10.6	Safeguards against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output $L_{Aeq,T}$, dB(A)		N/A
	Unweighted RMS output voltage (mV)		N/A
	Digital output signal (dBFS)		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30)		N/A
	Warning for MEL ≥ 100 dB(A)		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards.....		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	Corded listening devices with analogue input		N/A
	Listening device input voltage (mV)		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A)		N/A
10.6.6.3	Cordless listening devices		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A)		N/A

B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		Pass
B.1	General		Pass
B.1.5	Temperature measurement conditions	(See appended table B.1.5)	Pass
B.2	Normal operating conditions		Pass
B.2.1	General requirements	(See Test Item Particulars and appended test tables)	Pass
	Audio Amplifiers and equipment with audio amplifiers		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.2.3	Supply voltage and tolerances	±10%	Pass
B.2.5	Input test :	(See appended table B.2.5)	Pass
B.3	Simulated abnormal operating conditions		Pass
B.3.1	General	(See appended table B.3)	Pass
B.3.2	Covering of ventilation openings		N/A
	Instructional safeguard :		N/A
B.3.3	DC mains polarity test		N/A
B.3.4	Setting of voltage selector		N/A
B.3.5	Maximum load at output terminals	(See appended table B.3)	Pass
B.3.6	Reverse battery polarity		N/A
B.3.7	Audio amplifier abnormal operating conditions		N/A
B.3.8	Safeguards functional during and after abnormal operating conditions..... :		N/A
B.4	Simulated single fault conditions		Pass
B.4.1	General		Pass
B.4.2	Temperature controlling device		N/A
B.4.3	Blocked motor test		N/A
B.4.4	Functional insulation		Pass
B.4.4.1	Short circuit of clearances for functional insulation		Pass
B.4.4.2	Short circuit of creepage distances for functional insulation		Pass
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors		Pass
B.4.6	Short circuit or disconnection of passive components		Pass
B.4.7	Continuous operation of components		N/A
B.4.8	Compliance during and after single fault conditions :	(See appended table B.3, B.4)	Pass
B.4.9	Battery charging and discharging under single fault conditions		N/A
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus..... :		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	TEST GENERATORS		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		N/A
E.1	Electrical energy source classification for audio signals		N/A
	Maximum non-clipped output power (W)..... :		—
	Rated load impedance (Ω) :		—
	Open-circuit output voltage (V)..... :		—
	Instructional safeguard :	See Clause F.5	—
E.2	Audio amplifier normal operating conditions		N/A
	Audio signal source type..... :		—
	Audio output power (W) :		—
	Audio output voltage (V) :		—
	Rated load impedance (Ω) :		—
	Requirements for temperature measurement	(See appended table B.1.5)	N/A
E.3	Audio amplifier abnormal operating conditions	(See appended table B.3, B.4)	N/A
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		Pass
F.1	General		N/A
	Language :		—
F.2	Letter symbols and graphical symbols		N/A
F.2.1	Letter symbols according to IEC60027-1		N/A
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3	Equipment markings		Pass
F.3.1	Equipment marking locations	Building-in equipment, to be evaluated in the end product	N/A
F.3.2	Equipment identification markings		Pass
F.3.2.1	Manufacturer identification	OmniOn Power Inc.	Pass
F.3.2.2	Model identification	CAR2548FP, CAR2548TN	Pass
F.3.3	Equipment rating markings		Pass
F.3.3.1	Equipment with direct connection to mains		Pass
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of the supply voltage	AC	Pass
F.3.3.4	Rated voltage	200-240 or 100-240Vac	Pass
F.3.3.5	Rated frequency	47-63Hz	Pass
F.3.3.6	Rated current or rated power	16A	Pass
F.3.3.7	Equipment with multiple supply connections		N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		Pass
F.3.5.1	Mains appliance outlet and socket-outlet markings	No such component used	N/A
F.3.5.2	Switch position identification marking	No such component used	N/A
F.3.5.3	Replacement fuse identification and rating markings	(component ID: F1 in EMI board, F1 in Main board), Ratings (20A, 250Vac)	Pass
	Instructional safeguards for neutral fuse		N/A
F.3.5.4	Replacement battery identification marking	No such component used	N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		N/A
F.3.6.1	Class I equipment		N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Protective bonding conductor terminals		N/A
F.3.6.2	Equipment class marking		N/A
F.3.6.3	Functional earthing terminal marking		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.7	Equipment IP rating marking		N/A
F.3.8	External power supply output marking		N/A
F.3.9	Durability, legibility and permanence of marking		N/A
F.3.10	Test for permanence of markings		N/A
F.4	Instructions		N/A
	a) Information prior to installation and initial use		N/A
	b) Equipment for use in locations where children not likely to be present	Building-in equipment, to be evaluated in the end product	N/A
	c) Instructions for installation and interconnection		N/A
	d) Equipment intended for use only in restricted access area		N/A
	e) Equipment intended to be fastened in place		N/A
	f) Instructions for audio equipment terminals		N/A
	g) Protective earthing used as a safeguard		N/A
	h) Protective conductor current exceeding ES2 limits		N/A
	i) Graphic symbols used on equipment		N/A
	j) Permanently connected equipment not provided with all-pole mains switch		N/A
	k) Replaceable components or modules providing safeguard function		N/A
	l) Equipment containing insulating liquid		N/A
	m) Installation instructions for outdoor equipment		N/A
F.5	Instructional safeguards		N/A
G	COMPONENTS		Pass
G.1	Switches		N/A
G.1.1	General		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.1.3	Test method and compliance		N/A
G.2	Relays		N/A
G.2.1	Requirements		N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.2.4	Test method and compliance		N/A
G.3	Protective devices		Pass
G.3.1	Thermal cut-offs		N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A
G.3.4	Overcurrent protection devices	Approved current fuse used	Pass
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions :		N/A
G.4	Connectors		Pass
G.4.1	Spacings		Pass
G.4.2	Mains connector configuration..... :	Approved connector	Pass
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
G.5	Wound components		Pass
G.5.1	Wire insulation in wound components	Triple insulated wire	Pass
G.5.1.2	Protection against mechanical stress		Pass
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Test time (days per cycle)..... :		—
	Test temperature (°C) :		—

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.2.3	Wound components supplied from the mains		N/A
G.5.2.4	No insulation breakdown		N/A
G.5.3	Transformers		Pass
G.5.3.1	Compliance method..... :	IEC 62368-1	Pass
	Position :	T4, T2, T3, T5	Pass
	Method of protection :	Internal protection.	Pass
G.5.3.2	Insulation		N/A
	Protection from displacement of windings :	Triple insulation wire was used.	—
G.5.3.3	Transformer overload tests	(See appended table B.3)	Pass
G.5.3.3.1	Test conditions	(See appended table B.3)	Pass
G.5.3.3.2	Winding temperatures	(See appended table B.3)	Pass
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A
	FIW wire nominal diameter :		—
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation..... :		N/A
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N/A
G.5.3.4.5	Thermal cycling test and compliance		N/A
G.5.3.4.6	Partial discharge test		N/A
G.5.3.4.7	Routine test		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A
	Test duration (days) :		—
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.6	Locked-rotor overload test for DC motors		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature :		N/A
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage :		—
G.6	Wire Insulation		Pass
G.6.1	General		Pass
G.6.2	Enamelled winding wire insulation	Solvent-based enamel is considered to provide functional insulation only	N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements		N/A
	Type :		—
G.7.2	Cross sectional area (mm ² or AWG) :		N/A
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N) :		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm) :		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance		N/A
	Overall diameter or minor overall dimension, <i>D</i> (mm) :		—
	Radius of curvature after test (mm) :		—
G.7.6	Supply wiring space		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	Varistors		Pass
G.8.1	General requirements	Approved varistor used with V-1 material	Pass
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test	Method “reduce the likelihood of ignition” is not used	N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	Integrated circuit (IC) current limiters		N/A
G.9.1	Requirements		N/A
	IC limiter output current (max. 5A)..... :		—
	Manufacturers' defined drift :		—
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	Resistors		N/A
G.10.1	General		N/A
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A
G.10.4	Voltage surge test		N/A
G.10.5	Impulse test		N/A
G.10.6	Overload test		N/A
G.11	Capacitors and RC units		Pass
G.11.1	General requirements		Pass
G.11.2	Conditioning of capacitors and RC units		Pass
G.11.3	Rules for selecting capacitors	Approved X2 capacitor (C80) located between L and N Approved Y2 capacitor (C57) located between primary and PE	Pass
G.12	Optocouplers		Pass

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Clause	Requirement + Test	Result - Remark	Verdict
	Optocouplers comply with IEC 60747-5-5 with specifics	Comply with UL1577, and IEC60747-5-52007	Pass
	Type test voltage $V_{ini,a}$:	Recognized optocouplers used	—
	Routine test voltage, $V_{ini, b}$:	Recognized optocouplers used	—
G.13	Printed boards		N/A
G.13.1	General requirements		N/A
G.13.2	Uncoated printed boards		N/A
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation :		N/A
	Number of insulation layers (pcs) :		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements :		N/A
G.15	Pressurized liquid filled components		N/A
G.15.1	Requirements		N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
G.16.1	Condition for fault tested is not required		N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.16.2	Tests		N/A
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test..... :		—
	Mains voltage that impulses to be superimposed on :		—
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test..... :		—
G.16.3	Capacitor discharge test :		N/A
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringling signal		N/A
H.3.1.1	Frequency (Hz) :		—
H.3.1.2	Voltage (V) :		—
H.3.1.3	Cadence; time (s) and voltage (V) :		—
H.3.1.4	Single fault current (mA): :		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V)..... :		N/A
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		N/A
J.1	General		N/A
	Winding wire insulation :		—
	Solid round winding wire, diameter (mm) :		N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm ²) :		N/A
J.2/J.3	Tests and Manufacturing	(See separate test report)	—
K	SAFETY INTERLOCKS		N/A
K.1	General requirements		N/A
	Instructional safeguard :		N/A
K.2	Components of safety interlock safeguard mechanism		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A
K.5	Fail-safe		N/A
K.5.1	Under single fault condition		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Test method and compliance :		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm) :		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm) :		N/A
	Electric strength test before and after the test of K.7.2..... :		N/A
K.7.2	Overload test, Current (A)..... :		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	DISCONNECT DEVICES		N/A
L.1	General requirements		N/A
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single-phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		N/A
L.8	Multiple power sources		N/A
	Instructional safeguard :		N/A
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		N/A
M.1	General requirements		N/A
M.2	Safety of batteries and their cells		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
M.2.1	Batteries and their cells comply with relevant IEC standards		N/A
M.3	Protection circuits for batteries provided within the equipment		N/A
M.3.1	Requirements		N/A
M.3.2	Test method		N/A
	Overcharging of a rechargeable battery		N/A
	Excessive discharging		N/A
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance	(See appended table M.3)	N/A
M.4	Additional safeguards for equipment containing a portable secondary lithium battery		N/A
M.4.1	General		N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Requirements		N/A
M.4.2.2	Compliance	(See appended table M.4.2)	N/A
M.4.3	Fire enclosure		N/A
M.4.4	Drop test of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation and procedure for the drop test		N/A
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%):		N/A
M.4.4.4	Check of the charge/discharge function		N/A
M.4.4.5	Charge / discharge cycle test		N/A
M.4.4.6	Compliance		N/A
M.5	Risk of burn due to short-circuit during carrying		N/A
M.5.1	Requirement		N/A
M.5.2	Test method and compliance		N/A
M.6	Safeguards against short-circuits		N/A
M.6.1	External and internal faults		N/A
M.6.2	Compliance		N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.7.1	Ventilation preventing explosive gas concentration		N/A
	Calculated hydrogen generation rate		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m ³ /h)		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%)		N/A
M.7.3.3	Ventilation test – alternative 2		N/A
	Obtained hydrogen generation rate		N/A
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%)		N/A
M.7.4	Marking		N/A
M.8	Protection against internal ignition from external spark sources of batteries with aqueous electrolyte		N/A
M.8.1	General		N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
M.8.2.2	Estimation of hypothetical volume V_z (m ³ /s)		—
M.8.2.3	Correction factors		—
M.8.2.4	Calculation of distance d (mm)		—
M.9	Preventing electrolyte spillage		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse		N/A
	Instructional safeguard		N/A
N	ELECTROCHEMICAL POTENTIALS		N/A
	Material(s) used		—
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		Pass
	Value of X (mm)	1	—

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
P	SAFEGUARDS AGAINST CONDUCTIVE OBJECTS		N/A
P.1	General	To be evaluated in the end product	N/A
P.2	Safeguards against entry or consequences of entry of a foreign object		N/A
P.2.1	General		N/A
P.2.2	Safeguards against entry of a foreign object		N/A
	Location and Dimensions (mm) :		—
P.2.3	Safeguards against the consequences of entry of a foreign object		N/A
P.2.3.1	Safeguard requirements		N/A
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment		N/A
	Transportable equipment with metalized plastic parts :		N/A
P.2.3.2	Consequence of entry test..... :		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	Metallized coatings and adhesives securing parts		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T _c (°C) :		—
	Duration (weeks)..... :		—
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		N/A
Q.1	Limited power sources		N/A
Q.1.1	Requirements		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
Q.1.2	Test method and compliance		N/A
	Current rating of overcurrent protective device (A)		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A)		N/A
	Current limiting method.....		—
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General		N/A
R.2	Test setup		N/A
	Overcurrent protective device for test.....		—
R.3	Test method		N/A
	Cord/cable used for test.....		—
R.4	Compliance		N/A
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
S.3	Flammability test for the bottom of a fire enclosure		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Mounting of samples		—
	Wall thickness (mm)		—
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
T	MECHANICAL STRENGTH TESTS		Pass
T.1	General		Pass
T.2	Steady force test, 10 N	Applied to components.	Pass
T.3	Steady force test, 30 N		N/A
T.4	Steady force test, 100 N		N/A
T.5	Steady force test, 250 N		N/A
T.6	Enclosure impact test		N/A
	Fall test		N/A
	Swing test		N/A
T.7	Drop test		N/A
T.8	Stress relief test.....		N/A
T.9	Glass Impact Test	(See appended table T.9)	N/A
T.10	Glass fragmentation test		N/A
	Number of particles counted.....		N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm)		N/A
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N/A
U.1	General		N/A
	Instructional safeguard		N/A
U.2	Test method and compliance for non-intrinsically protected CRTs		N/A
U.3	Protective screen		N/A
V	DETERMINATION OF ACCESSIBLE PARTS		N/A
V.1	Accessible parts of equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
V.1.1	General		N/A
V.1.2	Surfaces and openings tested with jointed test probes		N/A
V.1.3	Openings tested with straight unjointed test probes		N/A
V.1.4	Plugs, jacks, connectors tested with blunt probe		N/A
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		N/A
V.2	Accessible part criterion		N/A
X	ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)		N/A
	Clearance :	(See appended table X)	N/A
Y	CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES		N/A
Y.1	General		N/A
Y.2	Resistance to UV radiation		N/A
Y.3	Resistance to corrosion		N/A
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by..... :		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A
Y.3.4	Test procedure :		N/A
Y.3.5	Compliance		N/A
Y.4	Gaskets		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests		N/A
	Alternative test methods :		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance		N/A
Y.4.6	Securing means	(See Annex P.4)	N/A
Y.5	Protection of equipment within an outdoor enclosure		N/A
Y.5.1	General		N/A
Y.5.2	Protection from moisture		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Relevant tests of IEC 60529 or Y.5.3 :		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A
Y.6	Mechanical strength of enclosures		N/A
Y.6.1	General		N/A
Y.6.2	Impact test :	(See Table T.6)	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.2	TABLE: Classification of electrical energy sources						Pass
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (mA)	Type ¹⁾	Additional Info ²⁾	
264Vac	48V output+ to -	Normal	48.7Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Abnormal	--	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U404 SC	48.6Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U404 OC	47.3Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U406 SC	0.4Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U406 OC	0.4Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – Q14 S to D SC	48.4Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – CR37 SC	48.4Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – CR28 SC	0.4Vdc	--	SS	--	ES1
264Vac	3.3Vsb output+ to -	Normal	3.8Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Abnormal	--	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U404 SC	3.8Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U404 OC	3.8Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U406 SC	0.4Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U406 OC	0.4Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – CR28 SC	3.3Vdc	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – U2 SC IO	3.5Vdc	--	SS	--	ES1
264Vac	48V output+ to GND	Normal	3.1Vrms	--	SS	63Hz	ES1
264Vac	48V output+ to -	Abnormal	--	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – C4, C5, C11, C12, C57 OC	2.7Vrms	--	SS	35KHz	ES1

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Clause	Requirement + Test			Result - Remark			Verdict
264Vac	48V output- to GND	Normal	1.8Vrms	--	SS	63Hz	ES1
264Vac	48V output+ to -	Abnormal	--	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – C4, C5, C11, C12, C57 OC	3.3Vrms	--	SS	35KHz	ES1
264Vac	3.3Vsb output+ to GND	Normal	1.7Vrms	--	SS	63Hz	ES1
264Vac	48V output+ to -	Abnormal	--	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – C4, C5, C11, C12, C57 OC	2.1Vrms	--	SS	35KHz	ES1
264Vac	3.3Vsb output- to GND	Normal	1.8Vrms	--	SS	63Hz	ES1
264Vac	48V output+ to -	Abnormal	--	--	SS	--	ES1
264Vac	48V output+ to -	Single fault – C4, C5, C11, C12, C57 OC	3.3Vrms	--	SS	35KHz	ES1
264Vac/63Hz	C80 pin1 to pin2	Normal	408Vpk	--	CP	470±20%	ES3
264Vac/63Hz	C80 pin1 to pin2	Abnormal	--	--	CP	--	ES3
264Vac/63Hz	C80 pin1 to pin2	Single fault – SC/OC	--	--	CP	--	ES3
--	--	Normal	--	--	SP	--	--
--	--	Abnormal	--	--	SP	--	--
--	--	Single fault – SC/OC	--	--	SP	--	--
--	--	Normal	--	--	RP	--	--
--	--	Abnormal	--	--	RP	--	--
--	--	Single fault – SC/OC	--	--	RP	--	--
Supplementary information:							
1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.							
2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.							

5.4.1.8	TABLE: Working voltage measurement					Pass
Location		RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

See table 5.4.2

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			N/A
Method			—	
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)	
Supplementary information:				

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics				Pass
Allowed impression diameter (mm) :			≤ 2 mm		—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)	
Bobbin/Header material made by E I Dupont, Cat. No. FR530	--	See table 4.1.2	125	1.5	
Header material made by E I Dupont, Cat. No. FR515	--	See table 4.1.2	125	1.4	
Header material Phenolic, Chang chun Plastic, T373J	--	See table 4.1.2	125	1.2	
Bobbin material made by RTP, Cat. No. RTP205FR	--	See table 4.1.2	125	0.6	
Input/Output Connector made by MOLEX , cat.no. 87663 series	--	See table 4.1.2	125	1.2	
Alternate Input/Output Connector made by FCI USA, Power-blade series	--	See table 4.1.2	125	1.1	
Alternate Input/Output Connector made by Tyco, Multi-beam XL series	--	See table 4.1.2	125	1.2	
Supplementary information:					
standarized materials					

5.4.2, 5.4.3	TABLE: Minimum Clearances/Creepage distance							Pass
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U _{rms} (V)	Freq ¹⁾ (kHz)	Required cl (mm)	cl (mm)	E.S. ²⁾ (V)	Required cr (mm)	cr (mm)
CAR2548FP MAIN POWER BD.	--	--	--	--	--	--	--	--

IEC 62368-1								
Clause	Requirement + Test			Result - Remark			Verdict	
PRIMARY TO SECONDARY (REINFORCED INSULATION)								
T4 PIN 6 to T4 PIN 2	+465 -0	303	139	* 3.9	7.0	--	6.5	7.0
T4 PIN 5 to T4 PIN 2	+795 - 390	332	139	* 3.9	8.0	--	7.0	8.0
T4 PIN 7 to T4 PIN 2	+45 -405	184	139	* 3.9	7.0	--	5.2	7.0
T4 PIN 8 to T4 PIN 2	+75 -385	184	139	* 3.9	7.0	--	5.2	7.0
T4 PIN 6 to T4 PIN 1	+415 -15	302	139	* 3.9	7.0	--	6.5	7.0
T4 PIN 5 to T4 PIN 1	+735 - 405	340	139	* 3.9	8.0	--	7.1	8.0
T4 PIN 7 to T4 PIN 1	+55 -435	187	139	* 3.9	7.0	--	5.5	7.0
T4 PIN 8 to T4 PIN 1	+35 -375	185	139	* 3.9	7.0	--	5.2	7.0
T4 PIN 6 to T4 PIN 3	+475 -15	303	139	* 3.9	7.0	--	6.6	7.0
T4 PIN 5 to T4 PIN 3	+725 - 345	330	139	* 3.9	8.0	--	7.0	8.0
T4 PIN 7 to T4 PIN 3	+35 -395	183	139	* 3.9	7.0	--	5.2	7.0
T4 PIN 8 to T4 PIN 3	+105 - 385	186	139	* 3.9	7.0	--	5.2	7.0
T4 PIN 6 to T4 PIN 4	+415 -15	303	139	* 3.9	7.0	--	6.5	7.0
T4 PIN 5 to T4 PIN 4	+735 - 395	339	139	* 3.9	8.0	--	7.1	8.0
T4 PIN 7 to T4 PIN 4	+55 -445	187	139	* 3.9	7.0	--	5.5	7.0
T4 PIN 8 to T4 PIN 4	+35 -375	184	139	* 3.9	7.0	--	5.2	7.0
T4 PIN 6 to T4 PIN E1	+455 -65	265	139	* 3.9	7.0	--	5.5	7.0
T4 PIN 5 to T4 PIN E1	+675 - 405	292	139	* 3.9	8.0	--	6.4	8.0
T4 PIN 7 to T4 PIN E1	+50 -435	215	139	* 3.9	7.0	--	5.5	7.0
T4 PIN 8 to T4 PIN E1	+75 -445	219	139	* 3.9	7.0	--	5.5	7.0

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
T4 PIN 6 to T4 PIN E2	+365 -55	263	139	* 3.9	7.0	--	5.5	7.0
T4 PIN 5 to T4 PIN E2	+675 - 455	302	139	* 3.9	8.0	--	6.5	8.0
T4 PIN 7 to T4 PIN E2	+0 -505	218	139	* 3.9	7.0	--	5.7	7.0
T4 PIN 8 to T4 PIN E2	+0 -425	215	139	* 3.9	7.0	--	5.5	7.0
T5-1 PIN to T5 PIN 1	+445 - 485	218	< 30	* 3.9	8.0	--	5.5	8.0
T5-2 PIN to T5 PIN 1	+425 - 465	195	< 30	* 3.9	8.0	--	5.5	8.0
T5-1 PIN to T5 PIN 2	+515 - 505	253	< 30	* 3.9	8.0	--	5.7	8.0
T5-2 PIN to T5 PIN 2	+445 - 475	203	< 30	* 3.9	8.0	--	5.5	8.0
T5-1 PIN to T5 PIN 4	+595 - 515	291	< 30	* 3.9	8.0	--	6.4	8.0
T5-2 PIN to T5 PIN 4	+455 - 495	225	< 30	* 3.9	8.0	--	5.7	8.0
T2-1 PIN to T2 PIN 1	+415 - 450	196	< 30	* 3.9	8.0	--	5.5	8.0
T2-2 PIN to T2 PIN 1	+375 - 425	225	< 30	* 3.9	8.0	--	5.5	8.0
T2-1 PIN to T2 PIN 2	+435 - 455	204	< 30	* 3.9	8.0	--	5.5	8.0
T2-2 PIN to T2 PIN 2	+400 - 425	202	< 30	* 3.9	8.0	--	5.5	8.0
T2-1 PIN to T2 PIN 4	+445 - 465	225	< 30	* 3.9	8.0	--	5.5	8.0
T2-2 PIN to T2 PIN 4	+415 - 435	196	< 30	* 3.9	8.0	--	5.5	8.0
T3-1 PIN to T3 PIN 1	+385 - 425	224	< 30	* 3.9	8.0	--	5.5	8.0
T3-2 PIN to T3 PIN 1	+515 - 435	291	< 30	* 3.9	8.0	--	6.4	8.0
T3-1 PIN to T3 PIN 2	+400 - 425	204	< 30	* 3.9	8.0	--	5.5	8.0
T3-2 PIN to T3 PIN 2	+435 - 425	251	< 30	* 3.9	8.0	--	5.5	8.0
T3-1 PIN to T3 PIN 4	+415 - 425	199	< 30	* 3.9	8.0	--	5.5	8.0

IEC 62368-1								
Clause	Requirement + Test			Result - Remark				Verdict
T3-2 PIN to T3 PIN 4	+380 - 425	220	< 30	* 3.9	8.0	--	5.5	8.0
T1 PIN 3 (DC-) to T1 PIN 2	+35 -385	184	< 30	* 3.9	5.8	--	5.2	5.8
T1 PIN 4 to T4 PIN E1	+75 -455	221	< 30	* 3.9	5.8	--	5.5	5.8
J102 PIN 2 to J101 PIN 5	+45 -395	185	< 30	* 3.9	5.5	--	5.2	5.5
C45 + to T4 PIN 4	+45 -365	176	< 30	* 3.9	6.0	--	5.2	6.0
T1 PIN 3 to J402 PIN 1	+35 -375	188	< 30	* 3.9	6.4	--	5.2	6.4
J401 PIN 16 to J402 PIN 1	+55 -375	190	< 30	* 3.9	5.7	--	5.2	5.7
CAR2548FP MAIN POWER BD.	--	--	--	--	--	--	--	--
PRIMARY TO CHASSIS (BASIC INSULATION)	--	--	--	--	--	--	--	--
T4 PIN 6 to CHASSIS	+405 -0	298	139	* 2.0	4.0	--	3.2	4.0
T4 PIN 5 to CHASSIS	+735 - 415	336	139	* 2.0	4.0	--	3.5	4.0
T4 PIN 7 to CHASSIS	+45 -455	187	139	* 2.0	4.0	--	2.8	4.0
T4 PIN 8 to CHASSIS	+35 -375	184	139	* 2.0	4.0	--	2.6	4.0
T5-1 PIN to CHASSIS	+505 - 455	251	< 30	* 2.0	4.0	--	2.9	4.0
T5-2 PIN to CHASSIS	+445 - 395	228	< 30	* 2.0	4.0	--	2.8	4.0
T2-1 PIN to CHASSIS	+445 - 405	227	< 30	* 2.0	4.0	--	2.8	4.0
T2-2 PIN to CHASSIS	+425 - 405	228	< 30	* 2.0	4.0	--	2.8	4.0
T3-1 PIN to CHASSIS	+425 - 395	227	< 30	* 2.0	4.0	--	2.8	4.0
T3-2 PIN to CHASSIS	+415 - 375	249	< 30	* 2.0	4.0	--	2.6	4.0
Q3 D to CHASSIS	+415 - 375	210	< 30	* 2.0	4.0	--	2.6	4.0
C4 + to CHASSIS	+415 -0	298	< 30	* 2.0	4.0	--	3.2	4.0
C4 - to CHASSIS	+0 -375	185	< 30	* 2.0	4.0	--	2.6	4.0

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
CR6 C to CHASSIS	+405 -0	192	< 30	* 2.0	4.0	--	2.6	4.0
CAR2548FP MAIN POWER BD. PRIMARY TO PRIMARY (FUNCTIONAL INSULATION)	--	--	--	--	--	--	--	--
Q3 D to Q3 S	+405 – 0	283	< 30	* 2.0	** 2900Vdc	--	3.2	** 2900Vdc
Q7 D to Q7 S	+415 – 0	273	< 30	* 2.0	** 2900Vdc	--	3.2	** 2900Vdc
Q8 D to Q8 S	+405 – 0	275	< 30	* 2.0	** 2900Vdc	--	3.2	** 2900Vdc
Q6 D to Q6 S	+735 – 55	414	< 30	* 2.6	** 3700Vdc	--	4.2	** 3700Vdc
C4 + to C4 -	+405 – 0	383	< 30	* 2.0	** 2900Vdc	--	4.0	** 2900Vdc
Supplementary information:								
1) Only for frequency above 30 kHz 2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied) Note 1: Only for frequency above 30 kHz Note 2: See table 5.4.2.4 if this is based on electric strength test Note 3: Provide Material Group FI: Functional insulation; BI: Basic insulation; SI: Supplementary insulation; RI: Reinforced insulation * The required clearances have been adjusted by multiplying the clearance requirement at sea level by factor of 1.29 for operating altitude of 4000 meter. ** The Dielectric Strength Test for deficiency spacing has also been adjusted by a multiplying factor of 1.24 for operating altitude of 4000 meter. Hipot Test time: 1 minute.								

5.4.4.2	TABLE: Minimum distance through insulation				N/A
Distance through insulation (DTI) at/of:	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)	
Supplementary information:					
No solid insulation used.					
Triple Insulated Wire used in transformer, tapes not used for insulation.					

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Clause	Requirement + Test			Result - Remark			Verdict
5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz						N/A
Insulation material	E_P	Frequency (kHz)	K_R	Thickness d (mm)	Insulation	V_{PW} (Vpk)	
Supplementary information:							

5.4.9	TABLE: Electric strength tests			Pass
Test voltage applied between:		Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No
Functional:		--	--	--
Q6 D to Q6 S		DC	* 3100Vdc	No
Q8 D to Q8 S		DC	* 2900Vdc	No
Q7 D to Q7 S		DC	* 2900Vdc	No
C4 (+) to C4 (-)		DC	* 2900Vdc	No
Secondary traces to secondary traces		DC	1000Vdc	No
Secondary traces to chassis		DC	1000Vdc	No
Basic/supplementary:		--	--	--
Power supply CAR2548TN series and CAR2548FP series AC input to chassis enclosure		DC	3100 Vdc	No
Test conducted on 1 layer of NOMEX insulator for Basic insulation between PWB and chassis		DC	3100 Vdc	No
Test conducted on 1 layer of FORMEX GK insulator for Basic insulation between PWB and chassis		DC	3100 Vdc	No
Test conducted on 1 layer of Kapton tape Permacel, cat.no. P221 and P222		DC	3100 Vdc	No
Test conducted on 1 layer of alternate Kapton tape Ideal, cat.no. 7170 and 7270		DC	3100 Vdc	No
Test conducted on 1 layer of alternate Kapton tape Changshu Fubang, cat.no. FK-01 series		DC	3100 Vdc	No
Test conducted on 1 layer of alternate Kapton tape Suzhou Creative, cat.no. KPT201 series		DC	3100 Vdc	No
Sleeving covering internal wires for Supplementary insulation		DC	3100 Vdc	No
Reinforced:		--	--	--
Power supply CAR2548TN series and CAR2548FP series		DC	4300 Vdc	No

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Clause	Requirement + Test	Result - Remark	Verdict
AC input to secondary outputs (with Y-caps removed).			
CAR2548TN series and CAR2548FP series Transformers T1, T2, T3, T4, T5, T101, T102 primary to secondary winding.	DC	4300 Vdc	No
Routine Tests:	--	--	--
--	--	--	--
Supplementary information:			
** The required clearances have been adjusted by multiplying the clearance requirement at sea level by factor of 1.29 for operating altitude of 4000 meter. * The dielectric strength test for deficiency spacing has also been adjusted by a multiplying factor of 1.24 for operating altitude of 4000 meter			

5.5.2.2	TABLE: Stored discharge on capacitors					Pass
Location	Supply Voltage (V)	Operating and fault condition ¹⁾	Switch position	Measured voltage (Vpk)	ES Class	
L to N	264V, 63HZ	N	N/A	0	ES1	
L to N	264V, 63HZ	R88 OC	N/A	0	ES1	
L to N	264V, 63HZ	TZ1 OC	N/A	0	ES1	
L to N	264V, 63HZ	RT1 OC	N/A	8V	ES1	
Supplementary information:						
X-capacitors installed for testing are: bleeding resistor rating: R87, R88, R89=100kΩ, RT1=10Ω ICX: N/A Notes: A. Test Location: Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth B. Operating condition abbreviations: N – Normal operating condition (e.g., normal operation, or open fuse); S –Single fault condition						

5.6.6	TABLE: Resistance of protective conductors and terminations					N/A
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)		
Supplementary information:						

5.7.4	TABLE: Unearthed accessible parts					N/A
Location			Parameters			

IEC 62368-1						
Clause	Requirement + Test			Result - Remark		Verdict
	Operating and fault conditions	Supply Voltage (V)	Voltage (V_{rms} or V_{pk})	Current (A_{rms} or A_{pk})	Freq. (Hz)	ES class
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit						

5.7.5	TABLE: Earthed accessible conductive part			Pass
Supply voltage (V):				—
Phase(s):		[] Single Phase; [] Three Phase; [] Delta; [] Wye		
Power Distribution System:		[] TN [] TT [] IT		
Location		Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment
		1	Normal:4.16 mApk Reverse:4.16 mApk	
		2*		
		3		
		4		
		5		
		6		
		8		
Supplementary Information:				
Notes: [1] Supply voltage is the anticipated maximum Touch Voltage [2] Earthed neutral conductor [Voltage differences less than 1% or more] [3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3 [4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable. [5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.				

5.8	TABLE: Backfeed safeguard in battery backed up supplies					N/A
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
Supplementary information:						
Abbreviation: SC= short circuit, OC= open circuit						

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Clause	Requirement + Test	Result - Remark	Verdict

6.2.2	TABLE: Power source circuit classifications					N/A
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power ¹⁾ (W)	Time (S)	PS class
A					3	
A					5	
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit						
1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.						

6.2.3.1	TABLE: Determination of Arcing PIS				N/A
Location		Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Arcing PIS? Yes / No
Supplementary information:					
An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (Vp) and normal operating condition rms current (Irms) is greater than 15.					

6.2.3.2	Table: Determination of Resistive PIS			N/A
Location		Operating and fault condition	Dissipate power (W)	Resistive PIS? Yes/No
Supplementary Information:				
Abbreviation: SC= short circuit; OC= open circuit				

8.5.5	TABLE: High Pressure Lamp				N/A
Lamp manufacturer	Lamp type	Explosion method	Longest axis of glass particle (mm)	Particle found beyond 1 m Yes / No?	
Manufacturer: Cat no.:					
Supplementary information:					

9.6	TABLE: Temperature measurements for wireless power transmitters			N/A
------------	--	--	--	-----

IEC 62368-1								
Clause	Requirement + Test				Result - Remark		Verdict	
Supply voltage (V) :								—
Max. transmit power of transmitter (W) :								—
Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)
Supplementary information:								

5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements					Pass
Supply voltage (V)		See below	See below	See below	See below	—
Ambient temperature during test T_{amb} (°C)		See below	See below	See below	See below	—
Maximum measured temperature T of part/at:		T (°C)				Allowed T_{max} (°C)
CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W		180V/63 Hz	180V/6 0Hz	180V/5 0Hz	180V/4 7Hz	--
INDUCTORL1 COIL		132	133	133	133	145
INDUCTORL2 COIL		118	118	118	118	145
INDUCTORL3 COIL		104	104	105	105	145
INDUCTORL4 COIL		101	100	100	100	145
INDUCTORL5 COIL		92	92	92	92	145
INDUCTORL6 COIL		70	70	71	71	145
INDUCTORL7 COIL		60	60	60	60	145
INDUCTORL8 COIL		123	123	123	123	145
INDUCTORL9 COIL		120	120	120	120	145
INDUCTORL16 COIL		127	127	127	127	145
INDUCTORL18 COIL		127	127	127	127	145
TRANSFORMER T1		78	79	78	78	90
TRANSFORMER T2 CLASS H		116	118	117	117	155
PWB under TRANSFORMER T2		95	95	95	95	130
TRANSFORMER T3 CLASS H		115	116	115	115	155
PWB under TRANSFORMER T3		114	115	115	115	130

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Clause	Requirement + Test		Result - Remark		Verdict
TRANSFORMER T4	88	88	88	88	90
TRANSFORMER T5 CLASS H	113	113	113	113	155
PWB under TRANSFORMER T5	108	109	109	108	130
TRANSFORMER T101	75	76	75	75	90
TRANSFORMER T102	85	86	86	86	90
TRANSISTOR Q9 BODY	89	89	89	89	130
TRANSISTOR Q16 BODY	66	66	66	67	130
TRANSISTOR Q17 BODY	69	69	69	69	130
TRANSISTOR Q21 BODY	92	92	92	92	130
DIODE CR29 BODY	120	120	121	121	130
DIODE CR41 BODY	128	127	127	127	130
DIODE CR46 BODY	128	128	128	128	130
CAPACITOR C6 BODY	61	61	61	61	105
CAPACITOR C35 BODY	119	119	119	119	125
CAPACITOR C72 BODY	108	108	108	108	125
CAPACITOR C76 BODY	118	118	118	118	125
BRIDGE DIODE BR1 body	111	111	111	111	130
OUTPUT CONNECTOR J1	101	101	101	101	105
ALTERNATE INDUCTORL1 COIL	124	124	124	124	145
ALTERNATE INDUCTORL2 COIL	122	122	122	122	145
TEST AMBIENT	50	50	50	50	---
CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W	264V/63 Hz	264V/60Hz	264V/50Hz	264V/47Hz	--
INDUCTORL1 COIL	97	97	97	97	145
INDUCTORL2 COIL	91	91	91	91	145
INDUCTORL3 COIL	82	82	82	83	145
INDUCTORL4 COIL	84	84	84	83	145
INDUCTORL5 COIL	87	86	86	86	145
INDUCTORL6 COIL	61	61	61	60	145
INDUCTORL7 COIL	58	58	58	58	145
INDUCTORL8 COIL	119	119	119	119	145
INDUCTORL9 COIL	114	114	114	114	145
INDUCTORL16 COIL	123	123	123	123	145
INDUCTORL18 COIL	122	122	122	122	145
TRANSFORMER T1	73	72	73	73	90
TRANSFORMER T2 CLASS H	113	113	113	113	155

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
PWB under TRANSFORMER T2	90	90	90	90	130
TRANSFORMER T3 CLASS H	108	108	108	108	155
PWB under TRANSFORMER T3	105	105	105	105	130
TRANSFORMER T4	82	82	82	82	90
TRANSFORMER T5 CLASS H	107	107	107	107	155
PWB under TRANSFORMER T5	103	103	103	103	130
TRANSFORMER T101	70	70	70	71	90
TRANSFORMER T102	80	80	80	80	90
TRANSISTOR Q9 BODY	85	84	84	84	130
TRANSISTOR Q16 BODY	61	61	61	61	130
TRANSISTOR Q17 BODY	63	63	63	63	130
TRANSISTOR Q21 BODY	86	86	86	86	130
DIODE CR29 BODY	117	116	116	116	130
DIODE CR41 BODY	121	121	121	121	130
DIODE CR46 BODY	123	123	123	123	130
CAPACITOR C6 BODY	58	58	57	57	105
CAPACITOR C35 BODY	114	114	114	114	125
CAPACITOR C72 BODY	104	104	104	104	125
CAPACITOR C76 BODY	113	113	113	113	125
BRIDGE DIODE BR1 body	93	93	93	93	130
OUTPUT CONNECTOR J1	96	96	96	96	105
ALTERNATE INDUCTORL1 COIL	91	91	91	91	145
ALTERNATE INDUCTORL2 COIL	89	89	89	90	145
TEST AMBIENT	50	50	50	50	---
CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	90V/63 Hz	90V/60 Hz	90V/50 Hz	90V/47 Hz	--
INDUCTORL1 COIL	102	102	102	102	145
INDUCTORL2 COIL	93	93	93	93	145
INDUCTORL3 COIL	84	84	84	84	145
INDUCTORL4 COIL	85	85	85	85	145
INDUCTORL5 COIL	65	65	65	65	145
INDUCTORL6 COIL	64	64	64	64	145
INDUCTORL7 COIL	58	58	58	58	145
INDUCTORL8 COIL	79	79	79	79	145
INDUCTORL9 COIL	78	79	78	78	145
INDUCTORL16 COIL	81	81	81	81	145

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTORL18 COIL	82	82	82	82	145
TRANSFORMER T1	65	65	64	65	90
TRANSFORMER T2 CLASS H	80	80	80	80	155
PWB under TRANSFORMER T2	73	73	73	73	130
TRANSFORMER T3 CLASS H	84	84	84	84	155
PWB under TRANSFORMER T3	85	85	85	85	130
TRANSFORMER T4	77	77	77	77	90
TRANSFORMER T5 CLASS H	80	80	80	80	155
PWB under TRANSFORMER T5	80	80	80	80	130
TRANSFORMER T101	64	64	63	64	90
TRANSFORMER T102	67	67	67	67	90
TRANSISTOR Q9 BODY	67	67	67	67	130
TRANSISTOR Q16 BODY	61	61	61	61	130
TRANSISTOR Q17 BODY	63	63	63	63	130
TRANSISTOR Q21 BODY	70	70	70	70	130
DIODE CR29 BODY	82	82	82	82	130
DIODE CR41 BODY	87	87	87	87	130
DIODE CR46 BODY	88	88	88	88	130
CAPACITOR C6 BODY	58	58	58	58	105
CAPACITOR C35 BODY	80	80	80	80	125
CAPACITOR C72 BODY	77	77	77	77	125
CAPACITOR C76 BODY	80	80	80	80	125
BRIDGE DIODE BR1 body	94	94	94	94	130
OUTPUT CONNECTOR J1	75	75	75	75	105
ALTERNATE INDUCTORL1 COIL	96	96	96	96	145
ALTERNATE INDUCTORL2 COIL	95	95	94	94	145
TEST AMBIENT	50	50	50	50	--
CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	132V/63 Hz	132V/60 Hz	132V/50 Hz	132V/47 Hz	--
INDUCTORL1 COIL	79	79	79	79	145
INDUCTORL2 COIL	75	75	75	75	145
INDUCTORL3 COIL	70	70	70	70	145
INDUCTORL4 COIL	77	77	77	77	145
INDUCTORL5 COIL	63	62	62	62	145
INDUCTORL6 COIL	59	59	59	59	145
INDUCTORL7 COIL	57	57	57	57	145

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTORL8 COIL	76	76	76	76	145
INDUCTORL9 COIL	76	76	76	76	145
INDUCTORL16 COIL	79	78	78	79	145
INDUCTORL18 COIL	79	79	79	79	145
TRANSFORMER T1	63	62	63	62	90
TRANSFORMER T2 CLASS H	78	78	78	78	155
PWB under TRANSFORMER T2	70	70	70	70	130
TRANSFORMER T3 CLASS H	80	80	80	80	155
PWB under TRANSFORMER T3	79	79	79	79	130
TRANSFORMER T4	75	74	74	74	90
TRANSFORMER T5 CLASS H	77	77	77	77	155
PWB under TRANSFORMER T5	77	76	77	77	130
TRANSFORMER T101	63	63	63	62	90
TRANSFORMER T102	65	64	64	64	90
TRANSISTOR Q9 BODY	64	64	64	64	130
TRANSISTOR Q16 BODY	58	58	58	58	130
TRANSISTOR Q17 BODY	59	59	59	59	130
TRANSISTOR Q21 BODY	67	67	67	67	130
DIODE CR29 BODY	80	80	80	80	130
DIODE CR41 BODY	84	84	84	84	130
DIODE CR46 BODY	84	84	84	84	130
CAPACITOR C6 BODY	56	55	56	56	105
CAPACITOR C35 BODY	78	77	78	78	125
CAPACITOR C72 BODY	74	74	74	74	125
CAPACITOR C76 BODY	77	77	77	77	125
BRIDGE DIODE BR1 body	81	81	81	81	130
OUTPUT CONNECTOR J1	72	72	72	72	105
ALTERNATE INDUCTORL1 COIL	76	76	76	76	145
ALTERNATE INDUCTORL2 COIL	75	75	75	75	145
TEST AMBIENT	50	50	50	50	--
CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W	180V/63 Hz	180V/ 60Hz	180V/ 50Hz	180V/4 7Hz	--
INDUCTORL1 COIL	136	136	136	136	145
INDUCTORL2 COIL	119	119	119	119	145
INDUCTORL3 COIL	111	110	111	111	145
INDUCTORL4 COIL	87	87	87	87	145

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTORL5 COIL	89	89	89	89	145
INDUCTORL6 COIL	64	64	65	64	145
INDUCTORL7 COIL	57	58	58	57	145
INDUCTORL8 COIL	105	105	105	105	145
INDUCTORL9 COIL	105	105	105	105	145
INDUCTORL16 COIL	109	109	108	108	145
INDUCTORL18 COIL	109	109	109	108	145
TRANSFORMER T1	77	77	77	77	90
TRANSFORMER T2 CLASS H	101	101	101	101	155
TRANSFORMER T3 CLASS H	118	118	118	118	155
TRANSFORMER T4	88	88	88	88	90
TRANSFORMER T5 CLASS H	113	113	113	113	155
TRANSFORMER T101	83	83	83	83	90
TRANSFORMER T102	85	85	85	85	90
PWB under TRANSFORMER T2	87	88	88	88	130
PWB under TRANSFORMER T3	94	94	94	94	130
PWB under TRANSFORMER T5	109	109	109	109	130
TRANSISTOR Q9 BODY	71	72	72	72	130
TRANSISTOR Q16 BODY	61	61	62	61	130
TRANSISTOR Q17 BODY	67	67	67	67	130
TRANSISTOR Q21 BODY	88	88	88	88	130
DIODE CR29 BODY	106	106	106	106	130
DIODE CR41 BODY	122	122	122	122	130
DIODE CR46 BODY	108	108	108	108	130
CAPACITOR C6 BODY	60	60	60	60	105
CAPACITOR C35 BODY	100	100	100	100	125
CAPACITOR C72 BODY	96	96	96	96	125
CAPACITOR C76 BODY	102	101	102	102	125
BRIDGE DIODE BR1 body	97	97	97	97	130
OUTPUT CONNECTOR J1	102	102	102	102	105
TEST AMBIENT	50	50	50	50	--
CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W	264V/63 Hz	264V/6 0Hz	264V/5 0Hz	264V/4 7Hz	--
INDUCTORL1 COIL	95	96	97	97	145
INDUCTORL2 COIL	89	90	90	90	145
INDUCTORL3 COIL	85	86	86	86	145

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTORL4 COIL	74	75	75	75	145
INDUCTORL5 COIL	82	83	83	83	145
INDUCTORL6 COIL	57	57	57	57	145
INDUCTORL7 COIL	55	56	56	56	145
INDUCTOR L8 COIL	100	100	101	101	145
INDUCTOR L9 COIL	99	100	101	100	145
INDUCTOR L16 COIL	104	104	104	105	145
INDUCTOR L18 COIL	102	103	103	103	145
TRANSFORMER T1	71	72	72	72	90
TRANSFORMER T2 CLASS H	96	96	97	96	155
TRANSFORMER T3 CLASS H	106	106	106	106	155
TRANSFORMER T4	81	82	82	82	90
TRANSFORMER T5 CLASS H	106	107	107	107	155
TRANSFORMER T101	75	76	76	76	90
TRANSFORMER T102	78	78	78	78	90
PWB under TRANSFORMER T2	82	83	83	83	130
PWB under TRANSFORMER T3	82	82	82	82	130
PWB under TRANSFORMER T5	102	102	103	102	130
TRANSISTOR Q9 BODY	67	67	67	67	130
TRANSISTOR Q16 BODY	57	56	56	56	130
TRANSISTOR Q17 BODY	60	60	60	60	130
TRANSISTOR Q21 BODY	80	80	81	81	130
DIODE CR29 BODY	101	101	102	101	130
DIODE CR41 BODY	116	116	117	117	130
DIODE CR46 BODY	102	102	103	102	130
CAPACITOR C6 BODY	56	56	56	57	105
CAPACITOR C35 BODY	94	95	95	95	125
CAPACITOR C72 BODY	91	92	92	92	125
CAPACITOR C76 BODY	96	96	97	96	125
BRIDGE DIODE BR1 body	82	82	83	82	130
OUTPUT CONNECTOR J1	96	96	97	96	105
TEST AMBIENT	50	50	50	50	--

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	90V/63 Hz	90V/60 Hz	90V/50 Hz	90V/47 Hz	--
INDUCTOR L1 COIL	107	107	107	107	145
INDUCTOR L2 COIL	98	98	97	97	145
INDUCTOR L3 COIL	90	90	90	90	145
INDUCTOR L4 COIL	76	76	76	76	145
INDUCTOR L5 COIL	65	65	65	65	145
INDUCTOR L6 COIL	60	60	60	60	145
INDUCTOR L7 COIL	56	56	56	56	145
INDUCTOR L8 COIL	73	73	73	73	145
INDUCTOR L9 COIL	73	74	73	74	145
INDUCTOR L16 COIL	75	75	75	75	145
INDUCTOR L18 COIL	76	76	76	76	145
TRANSFORMER T1	65	65	65	65	90
TRANSFORMER T2 CLASS H	75	74	74	75	155
TRANSFORMER T3 CLASS H	82	82	82	82	155
TRANSFORMER T4	76	76	76	76	90
TRANSFORMER T5 CLASS H	81	81	81	81	155
TRANSFORMER T101	70	70	70	70	90
TRANSFORMER T102	73	72	72	72	90
PWB under TRANSFORMER T2	70	70	70	70	130
PWB under TRANSFORMER T3	77	77	77	77	130
PWB under TRANSFORMER T5	81	81	81	81	130
TRANSISTOR Q9 BODY	62	62	62	62	130
TRANSISTOR Q16 BODY	58	58	58	58	130
TRANSISTOR Q17 BODY	62	62	62	62	130
TRANSISTOR Q21 BODY	72	72	72	72	130

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
DIODE CR29 BODY	78	77	78	78	130
DIODE CR41 BODY	87	87	87	87	130
DIODE CR46 BODY	80	80	80	80	130
CAPACITOR C6 BODY	57	57	57	57	105
CAPACITOR C35 BODY	74	74	74	74	125
CAPACITOR C72 BODY	73	72	72	73	125
CAPACITOR C76 BODY	75	75	75	75	125
BRIDGE DIODE BR1 body	86	85	85	85	130
OUTPUT CONNECTOR J1	76	76	76	76	105
TEST AMBIENT	50	50	50	50	--
CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	132V/63 Hz	132V/6 0Hz	132V/5 0Hz	132V/4 7Hz	--
INDUCTOR L1 COIL	80	80	80	80	145
INDUCTOR L2 COIL	77	76	76	76	145
INDUCTOR L3 COIL	73	73	73	73	145
INDUCTOR L4 COIL	69	69	69	69	145
INDUCTOR L5 COIL	62	62	62	62	145
INDUCTOR L6 COIL	56	56	56	56	145
INDUCTOR L7 COIL	54	54	54	54	145
INDUCTOR L8 COIL	70	70	70	70	145
INDUCTOR L9 COIL	72	71	71	71	145
INDUCTOR L16 COIL	72	72	72	72	145
INDUCTOR L18 COIL	73	73	73	72	145
TRANSFORMER T1	62	62	62	62	90
TRANSFORMER T2 CLASS H	72	72	72	72	155
TRANSFORMER T3 CLASS H	78	78	78	78	155
TRANSFORMER T4	73	73	73	73	90

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
TRANSFORMER T5 CLASS H	77	77	77	77	155
TRANSFORMER T101	66	65	65	65	90
TRANSFORMER T102	68	68	68	68	90
PWB under TRANSFORMER T2	67	67	67	67	130
PWB under TRANSFORMER T3	71	71	71	71	130
PWB under TRANSFORMER T5	77	77	77	77	130
TRANSISTOR Q9 BODY	60	59	60	59	130
TRANSISTOR Q16 BODY	55	55	55	55	130
TRANSISTOR Q17 BODY	57	57	57	57	130
TRANSISTOR Q21 BODY	68	68	68	68	130
DIODE CR29 BODY	75	75	75	75	130
DIODE CR41 BODY	84	84	84	84	130
DIODE CR46 BODY	76	76	76	76	130
CAPACITOR C6 BODY	55	55	55	55	105
CAPACITOR C35 BODY	71	71	71	71	125
CAPACITOR C72 BODY	70	70	70	70	125
CAPACITOR C76 BODY	72	72	72	72	125
BRIDGE DIODE BR1 body	74	74	74	74	130
OUTPUT CONNECTOR J1	73	73	73	73	105
TEST AMBIENT	50	50	50	50	--
CAR2548FP series OUTPUT at low line input: 48V/27.1A, 5Vsb/1A 1300W	90V/63 Hz At 30 ° C	90V/60 Hz At 30 ° C	90V/50 Hz At 30 ° C	90V/47 Hz At 30 ° C	--
INDUCTOR L1 COIL	95	95	94	94	125
INDUCTOR L2 COIL	93	93	92	93	125
INDUCTOR L3 COIL	77	77	77	77	125
INDUCTOR L4 COIL	51	51	51	51	125
INDUCTOR L5 COIL	47	47	47	47	125
INDUCTOR L6 COIL	44	44	44	44	125
INDUCTOR L7 COIL	44	44	44	43	125

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTOR L8 COIL	68	69	69	69	125
INDUCTOR L9 COIL	64	64	64	64	125
INDUCTOR L16 COIL	65	65	65	65	125
INDUCTOR L18 COIL	62	62	62	62	125
TRANSFORMER T1	48	48	48	48	70
TRANSFORMER T2 CLASS H	68	68	68	68	135
PWB under TRANSFORMER T2	53	53	53	53	110
TRANSFORMER T3 CLASS H	79	79	79	79	135
PWB under TRANSFORMER T3	62	62	62	62	110
TRANSFORMER T4	57	58	58	58	70
TRANSFORMER T5 CLASS H	69	69	70	70	135
PWB under TRANSFORMER T5	68	68	68	68	110
TRANSFORMER T101	56	56	57	56	70
TRANSFORMER T102	59	59	59	59	70
TRANSISTOR Q9 BODY	49	49	49	49	110
TRANSISTOR Q16 BODY	49	49	49	50	110
TRANSISTOR Q17 BODY	48	48	48	48	110
TRANSISTOR Q21 BODY	51	51	51	51	110
DIODE CR29 BODY	66	66	66	66	110
DIODE CR41 BODY	74	74	74	74	110
DIODE CR46 BODY	79	79	79	79	110
CAPACITOR C6 BODY	43	43	43	43	85
CAPACITOR C35 BODY	66	66	66	66	105
CAPACITOR C72 BODY	57	57	57	57	105
CAPACITOR C76 BODY	63	63	63	63	105
BRIDGE DIODE BR1 body	74	74	74	74	110
RELAY K1 body	45	45	45	45	70
FUSE F1 BODY	83	83	83	83	105
OUTPUT CONNECTOR J1	69	69	69	69	85
TEST AMBIENT	30	30	30	30	--
CAR2548FP series OUTPUT at low line input: 48V/27.1A,	132V/63 Hz At 30 °	132V/6	132V/5	132V/4	--

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
5Vsb/1A 1300W	C	0Hz At 30 ° C	0Hz At 30 ° C	7Hz At 30 ° C	
INDUCTOR L1 COIL	62	62	62	62	125
INDUCTOR L2 COIL	62	62	62	62	125
INDUCTOR L3 COIL	55	55	55	55	125
INDUCTOR L4 COIL	46	46	46	46	125
INDUCTOR L5 COIL	44	44	44	44	125
INDUCTOR L6 COIL	38	39	38	39	125
INDUCTOR L7 COIL	41	41	41	41	125
INDUCTOR L8 COIL	65	66	66	66	125
INDUCTOR L9 COIL	61	61	61	61	125
INDUCTOR L16 COIL	62	62	62	62	125
INDUCTOR L18 COIL	59	59	59	59	125
TRANSFORMER T1	44	44	44	44	70
TRANSFORMER T2 CLASS H	66	66	66	66	135
PWB under TRANSFORMER T2	49	50	49	49	110
TRANSFORMER T3 CLASS H	73	73	73	73	135
PWB under TRANSFORMER T3	58	58	58	58	110
TRANSFORMER T4	52	52	52	52	70
TRANSFORMER T5 CLASS H	65	66	66	66	135
PWB under TRANSFORMER T5	64	64	64	64	110
TRANSFORMER T101	52	52	52	52	70
TRANSFORMER T102	55	55	55	55	70
TRANSISTOR Q9 BODY	46	46	46	46	110
TRANSISTOR Q16 BODY	43	43	43	43	110
TRANSISTOR Q17 BODY	42	42	42	42	110
TRANSISTOR Q21 BODY	47	47	47	47	110

IEC 62368-1							
Clause	Requirement + Test			Result - Remark		Verdict	
DIODE CR29 BODY	63	63	63	64	110		
DIODE CR41 BODY	70	70	70	70	110		
DIODE CR46 BODY	74	74	74	74	110		
CAPACITOR C6 BODY	38	38	38	38	85		
CAPACITOR C35 BODY	63	63	63	63	105		
CAPACITOR C72 BODY	54	54	54	54	105		
CAPACITOR C76 BODY	60	60	60	60	105		
BRIDGE DIODE BR1 body	60	60	60	60	110		
RELAY K1 body	41	41	41	41	70		
FUSE F1 BODY	59	59	59	59	105		
OUTPUT CONNECTOR J1	58	58	58	58	85		
TEST AMBIENT	30	30	30	30	--		
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
Supplementary information:							
T_{amb} = The thermal steady state temperature measurement of the ambient air. T = The thermal steady state temperature measurement. T_{max} = The limit of the thermal steady state temperature measurement. Note 1: T_{ma} should be considered as directed by applicable requirement Note 2: T_{ma} is not included in assessment of Touch Temperatures (Clause 9)							

B.2.5		TABLE: Input test						Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
90V 63 Hz	--	12.794	--	1150.3	--	F1 rated 20A	12.794	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
100V 63 Hz	--	11.412	16	1138.1	--	F1 rated 20A	11.412	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
120V 63 Hz	--	9.409	16	1124.9	--	F1 rated 20A	9.409	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
132V 63 Hz	--	8.504	--	1118.4	--	F1 rated 20A	8.504	CAR2548FP series OUTPUT:

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Clause	Requirement + Test				Result - Remark		Verdict	
								48V/20.8A, 3.3V/1A 1000W
90V 60 Hz	--	12.799	--	1150.7	--	F1 rated 20A	12.799	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
100V 60 Hz	--	11.414	16	1138.5	--	F1 rated 20A	11.414	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
120V 60 Hz	--	9.406	16	1124.4	--	F1 rated 20A	9.406	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
132V 60 Hz	--	8.507	--	1118.1	--	F1 rated 20A	8.507	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
90V 50 Hz	--	12.814	--	1150.6	--	F1 rated 20A	12.814	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
100V 50 Hz	--	11.434	16	1138.4	--	F1 rated 20A	11.434	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
120V 50 Hz	--	9.427	16	1123.8	--	F1 rated 20A	9.427	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
132V 50 Hz	--	8.530	--	1117.4	--	F1 rated 20A	8.530	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
90V 47 Hz	--	12.826	--	1150.6	--	F1 rated 20A	12.826	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
100V 47 Hz	--	11.446	16	1138.4	--	F1 rated 20A	11.446	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
120V 47 Hz	--	9.441	16	1123.8	--	F1 rated 20A	9.441	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
132V 47 Hz	--	8.542	--	1117.0	--	F1 rated 20A	8.542	CAR2548FP series OUTPUT:

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
								48V/20.8A, 3.3V/1A 1000W
180V 63 Hz	--	15.489	--	2773.0	--	F1 rated 20A	15.489	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 63 Hz	--	13.836	16	2750.0	--	F1 rated 20A	13.836	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
240V 63 Hz	--	11.471	16	2726.0	--	F1 rated 20A	11.471	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
264V 63 Hz	--	10.374	--	2715.0	--	F1 rated 20A	10.374	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 60 Hz	--	15.495	--	2773.0	--	F1 rated 20A	15.495	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 60 Hz	--	13.847	16	2750.0	--	F1 rated 20A	13.847	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
240V 60 Hz	--	11.478	16	2726.0	--	F1 rated 20A	11.478	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
264V 60 Hz	--	10.388	--	2717.0	--	F1 rated 20A	10.388	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 50 Hz	--	15.564	--	2774.0	--	F1 rated 20A	15.564	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 50 Hz	--	13.906	16	2750.0	--	F1 rated 20A	13.906	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
240V 50 Hz	--	11.536	16	2726.0	--	F1 rated 20A	11.536	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
264V 60 Hz	--	10.433	--	2716.0	--	F1 rated 20A	10.433	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 60 Hz	--	15.598	--	2774.0	--	F1 rated 20A	15.598	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 60 Hz	--	13.924	16	2751.0	--	F1 rated 20A	13.924	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W

IEC 62368-1								
Clause		Requirement + Test				Result - Remark		Verdict
240V 60 Hz	--	11.544	16	2727.0	--	F1 rated 20A	11.544	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
264V 60 Hz	--	10.465	--	2716.0	--	F1 rated 20A	10.465	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 60 Hz	--	13.014	--	1170.1	--	F1 rated 20A	13.014	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
200V 60 Hz	--	11.583	16	1156.5	--	F1 rated 20A	11.583	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
240V 60 Hz	--	9.545	16	1140.7	--	F1 rated 20A	9.545	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
264V 60 Hz	--	8.635	--	1135.7	--	F1 rated 20A	8.635	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
90V 50 Hz	--	13.015	--	1170.5	--	F1 rated 20A	13.015	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
100V 50 Hz	--	11.580	16	1155.9	--	F1 rated 20A	11.580	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
120V 50 Hz	--	9.537	16	1140.1	--	F1 rated 20A	9.537	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
132V 50 Hz	--	8.634	--	1135.3	--	F1 rated 20A	8.634	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
90V 50 Hz	--	13.018	--	1170.1	--	F1 rated 20A	13.018	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
100V 50 Hz	--	11.587	16	1156.1	--	F1 rated 20A	11.587	CAR2548TN series OUTPUT:

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
								-54V/18.5A, 3.3V/1A 1000W
120V 50 Hz	--	9.552	16	1139.1	--	F1 rated 20A	9.552	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
132V 50 Hz	--	8.653	--	1135.2	--	F1 rated 20A	8.653	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
90V 50 Hz	--	13.027	--	1170.5	--	F1 rated 20A	13.027	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
100V 50 Hz	--	11.593	16	1155.7	--	F1 rated 20A	11.593	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
120V 50 Hz	--	9.564	16	1139.0	--	F1 rated 20A	9.564	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
132V 50 Hz	--	8.659	--	1134.3	--	F1 rated 20A	8.659	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
90V 50 Hz	--	15.411	--	2758.0	--	F1 rated 20A	15.411	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
100V 50 Hz	--	13.776	16	2736.0	--	F1 rated 20A	13.776	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
120V 50 Hz	--	11.431	16	2717.0	--	F1 rated 20A	11.431	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
132V 50 Hz	--	10.352	--	2703.0	--	F1 rated 20A	10.352	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
180V 50 Hz	--	15.417	--	2758.0	--	F1 rated 20A	15.417	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W

IEC 62368-1								
Clause		Requirement + Test				Result - Remark		Verdict
200V 50 Hz	--	13.783	16	2735.0	--	F1 rated 20A	13.783	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
240V 50 Hz	--	11.434	16	2714.0	--	F1 rated 20A	11.434	CAR2548TN series OUTPUT: - 54V/46.25A, 3.3V/1A 2500W
264V 60 Hz	--	10.360	--	2702.0	--	F1 rated 20A	10.360	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
180V 50 Hz	--	15.471	--	2758.0	--	F1 rated 20A	15.471	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
200V 50 Hz	--	13.845	16	2736.0	--	F1 rated 20A	13.845	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
240V 50 Hz	--	11.488	16	2714.0	--	F1 rated 20A	11.488	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
264V 50 Hz	--	10.417	--	2703.0	--	F1 rated 20A	10.417	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
180V 47 Hz	--	15.507	--	2759.0	--	F1 rated 20A	15.507	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
200V 47 Hz	--	13.876	16	2737.0	--	F1 rated 20A	13.876	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
240V 47 Hz	--	11.519	16	2714.0	--	F1 rated 20A	11.519	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
264V 47 Hz	--	10.443	--	2703.0	--	F1 rated 20A	10.443	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
90V, 63Hz	--	16.396A	--	1512.5W	--	F1 rated 20A	16.396A	48V/27.1A 5Vsb/1A 1300W

IEC 62368-1								
Clause	Requirement + Test					Result - Remark		Verdict
100V, 63Hz	--	14.545A	16	1483.9W	--	F1 rated 20A	14.545A	48V/27.1A 5Vsb/1A 1300W
120V, 63Hz	--	11.972A	16	1456.5W	--	F1 rated 20A	11.972A	48V/27.1A 5Vsb/1A 1300W
132V, 63Hz	--	10.820A	--	1443.7W	--	F1 rated 20A	10.820A	48V/27.1A 5Vsb/1A 1300W
90V, 60Hz	--	16.390A	--	1512.0W	--	F1 rated 20A	16.390A	48V/27.1A 5Vsb/1A 1300W
100V, 60Hz	--	14.541A	16	1483.5W	--	F1 rated 20A	14.541A	48V/27.1A 5Vsb/1A 1300W
120V, 60Hz	--	11.964A	16	1455.6W	--	F1 rated 20A	11.964A	48V/27.1A 5Vsb/1A 1300W
132V, 60Hz	--	10.825A	--	1443.9W	--	F1 rated 20A	10.825A	48V/27.1A 5Vsb/1A 1300W
90V, 50Hz	--	16.412A	--	1512.8W	--	F1 rated 20A	16.412A	48V/27.1A 5Vsb/1A 1300W
100V, 50Hz	--	14.591A	16	1486.0W	--	F1 rated 20A	14.591A	48V/27.1A 5Vsb/1A 1300W
120V, 50Hz	--	12.029A	16	1459.1W	--	F1 rated 20A	12.029A	48V/27.1A 5Vsb/1A 1300W
132V, 50Hz	--	10.853A	--	1443.9W	--	F1 rated 20A	10.853A	48V/27.1A 5Vsb/1A 1300W
90V, 47Hz	--	16.419A	--	1512.1W	--	F1 rated 20A	16.419A	48V/27.1A 5Vsb/1A 1300W
100V, 47Hz	--	14.601A	16	1485.4W	--	F1 rated 20A	14.601A	48V/27.1A 5Vsb/1A 1300W
120V, 47Hz	--	12.048A	16	1459.2W	--	F1 rated 20A	12.048A	48V/27.1A 5Vsb/1A 1300W
132V, 47Hz	--	10.865A	--	1443.2W	--	F1 rated 20A	10.865A	48V/27.1A 5Vsb/1A 1300W
Supplementary information:								

B.3, B.4	TABLE: Abnormal operating and fault condition tests						Pass
Ambient temperature T_{amb} (°C)					See below		—
Power source for EUT: Manufacturer, model/type, output rating . :					--		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
CAR2548FP Stalled fans with full load	Unit run full load with no force air	240	7 minutes	F1 at AC line,	0A	Unit operate at full load with no airflow for 7 minutes, unit stop working and fuse in EMI board open when T2 reached 151 °C,	

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Clause	Requirement + Test			Result - Remark		Verdict
				F1 at AC neutral		T3 reached 155 ° C, T5 reached 154 ° C, T4 reached 111 ° C, at 25 ° C ambient
CAR2548TN -54V Output Overload Test	-54V output overloaded to 58A when 3.3Vsb/1A	240	4 hrs	F1 at AC line, F1 at AC neutral	12.48A	T2 = 97°C T3 = 101°C T5 = 111°C at 50°C ambient,
CAR2548TN 3.3Vsb Output Overload Test	3.3Vsb output overloaded to 1.92A when -54V/46.25A	240	4 hrs	F1 at AC line, F1 at AC neutral	11.48A	T4 = 89°C at 50°C ambient,
CAR2548FP 48V Output Overload Test	48V output overloaded to 58.4A when 3.3Vsb/1A	240	4 hrs	F1 at AC line, F1 at AC neutral	12.997A	T2 = 113°C T3 = 99°C T5 = 121°C at 50°C ambient,
CAR2548FP 3.3Vsb Output Overload Test	3.3Vsb output overloaded to 1.8A when 48V/52A	240	4 hrs	F1 at AC line, F1 at AC neutral	11.535A	T4 = 90°C at 50°C ambient,
CAR2548TN -54V transformer Winding Overload Test	-54V transformer Winding overloaded to 57.8A when 3.3Vsb/1A	180	4 hrs	F1 at AC line, F1 at AC neutral	16.54A	T2 = 100°C T3 = 105°C T5 = 115°C at 50°C ambient,
CAR2548TN 3.3Vsb transformer Winding Overload Test	3.3Vsb transformer Winding overloaded to 1.8A when -54V/46.25A	180	4 hrs	F1 at AC line, F1 at AC neutral	15.48A	T4 = 92°C at 50°C ambient,
CAR2548FP 48V transformer Winding Overload Test	48V transformer Winding overloaded to 57.4A when 3.3Vsb/1A	180	4 hrs	F1 at AC line, F1 at AC neutral	17.182A	T2 = 115°C T3 = 104°C T5 = 125°C at 50°C ambient,
CAR2548FP 3.3Vsb transformer Winding Overload Test	3.3Vsb transformer Winding overloaded to 1.8A when 48V/52A	180	4 hrs	F1 at AC line, F1 at AC neutral	15.528A	T4 = 96°C at 50°C ambient,
CAR2548FP L1 L-N	short	240	1 sec	F1 at AC line,	0A	Both Fuses open immediately,

IEC 62368-1						
Clause	Requirement + Test			Result - Remark		Verdict
				F1 at AC neutral		
CAR2548FP BR1 AC to (+)	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Both Fuses open immediately,
CAR2548FP Primary C6	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Fuse in the Main Board open immediately,
CAR2548FP Primary Q4 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Fuse in EMI Board open immediately, Q3, Q4, Q16, Q17 fail .
CAR2548FP Primary Q6 G-S	short	240	1 sec	F1 at AC line, F1 at AC neutral	0.230A	All outputs shut down immediately
CAR2548FP Primary C45	short	240	1 sec	F1 at AC line, F1 at AC neutral	0.244A	All outputs shut down immediately
CAR2548FP Primary Q22 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Fuse in EMI Board open immediately, Q7, Q8, Q21, Q22 fail
CAR2548FP Primary C81	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Fuse in the Main Board open immediately,
CAR2548FP Primary Q7 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Fuse in EMI Board open immediately, Q7, Q8, Q21, Q22 fail.
CAR2548FP Primary Q24 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Fuse in EMI Board open immediately, Q9, Q10, Q23, Q24 fail
CAR2548FP Primary Q23 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Fuse in EMI Board open immediately, Q9, Q10, Q23, Q24 fail
CAR2548FP Secondary L8	short	240	1 hour	F1 at AC line, F1 at AC neutral	11.43A	Unit runs stable. All outputs remain below SELV level. T2: 93 ° C, T3: 90 ° C, T5: 88 ° C,

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Clause	Requirement + Test			Result - Remark		Verdict
						At test ambient 25 ° C.
CAR2548FP CR18	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	Outputs shut down immediately. No output overshoot exceeds ES1 level.
CAR2548FP 48V Output short circuit Test	48V output Short circuit 0.2A when 3.3Vsb/1A	240	4 hr	F1 at AC line, F1 at AC neutral	0.462A	T2 = 55°C T3 = 55°C T5 = 56°C at 50°C ambient
CAR2548FP 3.3Vsb Output short circuit Test	3.3Vsb output Short circuit 2.2A	240	4 hr	F1 at AC line, F1 at AC neutral	0.494A	T4 = 77°C at 50°C ambient All outputs shut down,
Supplementary information:						
Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column "Abnormal/Fault." Specify if test condition by indicating "Abnormal" then the condition for a Clause B.3 test or "Single Fault" then the condition for Clause B.4. Due to the similar design, abnormal tests conducted on CAR2548FP series also represent tests on CAR2548TN series After each fault test, the power supply was hipot tested with 4300Vdc between primary and secondary, and 3100 Vdc between primary and chassis; no breakdown of insulation. During each abnormal test, cheesecloth and paper tissue were used to placed underneath and over the unit under test; after each abnormal, the cheesecloth and tissue remain intact, no flame, no molten metal. Also during each abnormal, the output did not exceed 42.4 Vpk or 60 Vdc in longer than 0.2 sec. In addition, the 71 Vpk and 120 Vdc limit was not exceeded at any time. Due to the similar design, abnormal tests conducted on CAR2548FP series also represent tests on CAR2548TN series After each fault test, the power supply was hipot tested with 4300Vdc between primary and secondary, and 3100 Vdc between primary and chassis; no breakdown of insulation. During each abnormal test, cheesecloth and paper tissue were used to placed underneath and over the unit under test; after each abnormal, the cheesecloth and tissue remain intact, no flame, no molten metal. Also during each abnormal, the output did not exceed 42.4 Vpk or 60 Vdc in longer than 0.2 sec. In addition, the 71 Vpk and 120 Vdc limit was not exceeded at any time.						

M.3	TABLE: Protection circuits for batteries provided within the equipment					N/A
Is it possible to install the battery in a reverse polarity position? :						—
Equipment Specification	Charging					
	Voltage (V)			Current (A)		
Manufacturer/type	Battery specification					
	Non-rechargeable batteries		Rechargeable batteries			
			Charging			

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Clause	Requirement + Test			Result - Remark			Verdict
	Discharging current (A)	Unintentional charging current (A)	Voltage (V)	Current (A)	Discharging current (A)	Reverse charging current (A)	
Note: The tests of M.3.2 are applicable only when above appropriate data is not available.							
Specified battery temperature (°C)							
Component No.	Fault condition	Charge/ discharge mode	Test time	Temp. (°C)	Current (A)	Voltage (V)	Observation
Supplementary information:							
Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.							

M.4.2	TABLE: Charging safeguards for equipment containing a secondary lithium battery					N/A
Maximum specified charging voltage (V)					—	
Maximum specified charging current (A)					—	
Highest specified charging temperature (°C)						
Lowest specified charging temperature (°C)						
Battery manufacturer/type	Operating and fault condition	Measurement			Observation	
		Charging voltage (V)	Charging current (A)	Temp. (°C)		
	Normal					
	Abnormal					
	Single fault – SC/OC					
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature						

Q.1	TABLE: Circuits intended for interconnection with building wiring (LPS)						N/A
Output Circuit	Condition	U _{oc} (V)	Time (s)	I _{sc} (A)		S (VA)	
				Meas.	Limit	Meas.	Limit

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary Information:

SC=Short circuit, OC=Open circuit

T.2, T.3, T.4, T.5	TABLE: Steady force test						N/A
Location/Part	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation	
Supplementary information:							

T.6, T.9	TABLE: Impact test					N/A
Location/Part	Material	Thickness (mm)	Height (mm)	Observation		
Supplementary information:						

T.7	TABLE: Drop test					N/A
Location/Part		Material	Thickness (mm)	Height (mm)	Observation	
Supplementary information:						

T.8	TABLE: Stress relief test					N/A
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation	
Supplementary information:						

X	TABLE: Alternative method for determining minimum clearances distances			N/A
Clearance distanced between:	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Supplementary information:			

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: Critical components information					Pass
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
01. Input/ Output Connector	MOLEX L L C	87663 series	250Vac, 30A, V-0, 105°C	UL1977	UL E29179 , - -	
01a. Input/ Output Connector- Alternate	FCI USA L L C	Power-blade series	250Vac, 30A, V-0, 105°C	UL1977	UL E66906 , - -	
01b. Input/ Output Connector - Alternate	TYCO ELECTRONICS CORP	Multi-beam XL series	250Vac, 30A, V-0, 105°C	UL1977	UL E29179 , - -	
02. C4, C5, C11, C12 in EMI board, and C56, C66 in main power board (any one can be optional)	VISHAY ELECTRONIC GMBH	WKO or WYO Series	Max. 4700pF, Min. 250Vac, 125°C	UL 60384-14	UL E183844 , --	
02a. C4, C5, C11, C12 in EMI board, and C56, C66 in main power board (any one can be optional) - Alternate	MURATA MFG CO LTD	KH	Max.4700pF,Min.2 50Vac, 125°C	UL 60384-14	UL E37921 , - -	
02b. C4, C5, C11, C12 in EMI board, and C56, C66 in main power board (any one can be optional) - Alternate	WALSIN TECHNOLOGY CORP	AC series or AH series	Max.4700pF,Min.2 50Vac, 125°C	UL 60384-14	UL E146544 , --	
02c. C4, C5, C11, C12 in EMI board, and C56, C66 in main power board (any one can be	HOLY STONE ENTERPRISE CO LTD	SDC-Y series	Max.4700pF,Min.2 50Vac, 125°C	UL 60384-14	UL E300818 , --	

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
optional) - Alternate					
02d. C4, C5, C11, C12 in EMI board, and C56, C66 in main power board (any one can be optional) - Alternate	SUCCESS ELECTRONICS CO LTD	SF series	Max.4700pF,Min.2 50Vac, 125°C	UL 60384-14	UL E114280 , --
03. Y2-Capacitor C57 in main power board (optional)	VISHAY ELECTRONIC GMBH	WKO or WYO Series	Max. 2200pF, Min. 250Vac, 125°C	UL 60384-14	UL E183844 , --
03a. Y2- Capacitor C57 in main power board (optional)- Alternate	MURATA MFG CO LTD	KH	Max.2200pF,Min.2 50Vac, 125°C	UL 60384-14	UL E37921 , - -
03b. Y2- Capacitor C57 in main power board (optional)- Alternate	WALSIN TECHNOLOGY CORP	AC series or AH series	Max.2200pF,Min.2 50Vac, 125°C	UL 60384-14	UL E146544 , --
03c. Y2- Capacitor C57 in main power board (optional)- Alternate	HOLY STONE ENTERPRISE CO LTD	SDC-Y series	Max.2200pF,Min.2 50Vac, 125°C	UL 60384-14	UL E300818 , --
03d. Y2- Capacitor C57 in main power board (optional)- Alternate	SUCCESS ELECTRONICS CO LTD	SF series	Max.2200pF,Min.2 50Vac, 125°C	UL 60384-14	UL E114280 , --
04. X2-Capacitor C6 in EMI Board	OKAYA ELECTRIC INDUSTRIES CO LTD	LE Series	Max.2.2uF, Min.275Vac, 100°C,X2 Type	UL 60384-14	UL E47474 , - -
04a. X2- Capacitor C6 in EMI Board - Alternate	VISHAY ELECTRONICA PORTUGAL LDA	F1772 series	Max.2.2uF, Min.310Vac, 110°C,X2 Type	UL 60384-14	UL E354331 , --

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
05. X2- Capacitors C3, C10 in EMI board, and C80 in main power board (any one can be optional)	OKAYA ELECTRIC INDUSTRIES CO LTD	LE Series	C3, C80: Max.0.47uF C10: Max.1uF Min.275Vac, 100°C, X2 Type	UL 60384-14	ULE47474 , --
05a. X2- Capacitors C3, C10 in EMI board, and C80 in main power board (any one can be optional)- Alternate	VISHAY ELECTRONICA PORTUGAL LDA	F1772 or F1778 or 339 series	C3, C80: Max.0.47uF C10: Max.1uF Min.310Vac, 110°C,X2 Type	UL 60384-14	UL E354331 , --
05b. X2- Capacitors C3, C10 in EMI board, and C80 in main power board (any one can be optional)- Alternate	XIAMEN FARATRONIC CO LTD	MKP62 series or MKP61 series or MKP63 series	C3, C80: Max.0.47uF C10: Max.1uF Min.275Vac 110°C	UL 60384-14	ULE186600 , --
05c. X2- Capacitors C3, C10 in EMI board, and C80 in main power board (any one can be optional)- Alternate	HUA JUNG COMPONENTS CO LTD	MKP Series	C3, C80: Max.0.47uF C10: Max.1uF Min.275Vac 110°C	UL 60384-14	ULE149075 , --
05d. X2- Capacitors C3, C10 in EMI board, and C80 in main power board (any one can be optional)- Alternate	CAMEL TECHNOLOGY CORP	MPX Series	C3, C80: Max.0.47uF C10: Max.1uF Min.310Vac 110°C	UL 60384-14	ULE200768 , --
06.Varistor MOV (TZ1)	LITTELFUSE INC	320L series or 300L series	Min. 300Vac, 125°CMin. V-1	UL 1449	UL E332226 , --

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
07. NTC Thermistors(RT1)	AMETHERM INC	SL22 series	10Ω ±20% at 125°C	UL 1434	UL E209153 , --
07a. NTC Thermistors(RT1) - Alternate	Interchangeable	Interchangeable	10Ω ±20% at 125°C	UL 1434	UL , --
08.Diode Bridges (BR1)	Interchangeable	Interchangeable	Min.40A Min.600V	UL1012, UL1310	UL , --
09. Input Fuses (F1 in EMI board, F1 in Main board)	LITTELFUSE INC	324 Series	20A, 250Vac	UL 248-1, UL 248- 14	UL E67006 , - -
09a. Input Fuses (F1 in EMI board, F1 in Main board)-Alternate	OPTIFUSE	FCA-P Series	20A, 250Vac	UL 248-1, UL 248- 14	UL E197390 , --
09b. Input Fuses (F1 in EMI board, F1 in Main board)-Alternate	COOPER BUSSMANN LLC	ABC Series	20A, 250Vac	UL 248-1, UL 248- 14	UL E19180 , - -
09c. Input Fuses (F1 in EMI board, F1 in Main board)-Alternate	CONQUER ELECTRONICS CO LTD	ABP Series	20A, 250Vac	UL 248-1, UL 248- 14	UL E82636 , - -
10.Opto-isolators (U404, U406)	FAIRCHILD SEMICONDUCTO R CORP	FOD817B series or H11A817 series	Dti ≥0.4 mm, Ext Cr≥8.0 mm, Ext Cl≥8.0 mm,150 °C. Double protection optical isolators, provides 5000 Vac isolation.	UL 1577, IEC60747-5-2	UL E90700 , - -
10a. Opto- isolators (U404, U406) -Alternate	NEC	PS2561 series	Dti ≥0.4 mm, Ext Cr>7.5 mm, 110°C, Double protection optical isolators, provides 5000 Vac isolation.	UL 1577, IEC60747-5-2	ULE72422 , --
11. Primary Inductor L1 in EMI board	Interchangeable	Interchangeable	Toroidal core with approximately 22.1mm OD. (Winding wire rated 155°C.), See	tested in unit	-- , --

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
			enclosure ID 04-01 for details.		
12. Primary Inductor L2 in EMI board	Interchangeable	Interchangeable	Toroidal core with approximately 23.9mm OD. (Winding wire rated 155°C), See enclosure ID 04-02 for details.	tested in unit	-- , --
13. Primary Inductor L3 in EMI board	Interchangeable	Interchangeable	Toroidal core with approximately 22.1mm OD. (Winding wire rated 155°C.), See enclosure ID 04-03 for details.	tested in unit	-- , --
14. Primary Inductor L4	Interchangeable	Interchangeable	Toroidal core with approximately 18.3mm OD. (Winding wire rated 155°C. Optional Base, material rated minimum 150°C,) phenolic Chang Chun Plastic, T373J or E.I. Dupont, Type FR530 or FR515 minimum 0.75 mm thick. See enclosure ID 04-04 for details.	tested in unit	-- , --
15. Primary Inductor L5	Interchangeable	Interchangeable	Toroidal core with approximately 23.9mm OD. (Winding wire rated 155°C. Optional Base, material rated minimum 150°C,) phenolic Chang Chun Plastic, T373J or E.I. Dupont, Type	tested in unit	-- , --

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
			FR530 or FR515 minimum 0.75 mm thick. See enclosure ID 04-05 for details.		
16. Primary Inductor L6	Interchangeable	Interchangeable	Toroidal core with approximately 26.9mm OD. (Winding wire rated 155°C. Optional Base, material rated minimum 150°C.) See enclosure ID 04-06 for details.	tested in unit	-- , --
17. Primary Inductor L7	Interchangeable	Interchangeable	Toroidal core with approximately 12.7mm OD. (Winding wire rated 155°C. Optional Base, material rated minimum 150°C,) phenolic Chang Chun Plastic, T373J or E.I. Dupont, Type FR530 or FR515 minimum 0.75 mm thick. See enclosure ID 04-07 for details.	tested in unit	-- , --
18.Main Transformer (T2, T3, T5)	OmniOn Power Inc.	310130	Class H, See enclosure ID 04-08 for details. Pri-Sec insulation provided three layers of FEP or PFA insulation from triple insulated wires. Insulation system is rated Class H	UL 1446	UL E86866 , - -

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
			(designated D180-3)		
19.Bias Transformer (T4)	Interchangeable	Interchangeable	Class A, See enclosure ID 04-09 for details.	--	-- , --
19-1.Insulation system	Interchangeable	Interchangeable	Class A	tested in unit	-- , --
19-2.Bobbin	Interchangeable	Interchangeable	94V-0, 150°C	UL 94	UL , --
19-3. Magnet wire	Interchangeable	MW80C	155°C	UL 1446	UL , --
19-4. Triple insulated wire	Interchangeable	Interchangeable	155°C	UL 2353	UL , --
19-5. Tape	Interchangeable	Interchangeable	220°C	UL 510	UL , --
19-6. Tube	Interchangeable	Interchangeable	200°C	UL 224	UL , --
19-7. Varnish	Interchangeable	Interchangeable	200°C	UL 1446	UL , --
20.PFC MOSFETs (Q7, Q8, Q21, Q22)	--	--	500V min, 30A min	--	-- , --
21.PFC MOSFETs (Q3, Q4, Q16, Q17)	--	--	500V min, 22A min	--	-- , --
22.Printed wiring board	SANTIS SUBSTRATES LTD or Interchangeable	Type 6, 7, 8, 9, 10, or 11 or equivalent	Min. V-1, Min. 130 °C, rated for direct support of live parts	UL 796	UL , --
23.Heat shrinkable tubing	Interchangeable	Interchangeable	Min. 300 V, VW-1, 125°C.	UL 224	UL , --
24. Bleeder resistor (R87, R88, R89)	Interchangeable	Interchangeable	100kΩ, 0.125W	--	-- , --

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
25. Electrolytic Capacitor(C4, C5, C6, C40)	Interchangeable	Interchangeable	Max. 330uF, Min. 400V, 105°C.	--	-- , --
26. Electrolytic Capacitor(C81)	Interchangeable	Interchangeable	Max. 180uF, Min. 400V, 105°C.	--	-- , --
27. Adhesive Glue	Interchangeable	Interchangeable	Min. V-2	UL94, UL746C	UL , --
28. Secondary connectors	Interchangeable	Interchangeable	Copper alloy pins housed in bodies of plastic rated V-2 minimum.	UL94, UL746C	UL , --
28a. Secondary connectors-Alternate	Interchangeable	Interchangeable	-	UL498, UL1977	UL , --
29. DC Fans (two supplied)	DELTA ELECTRONICS INC	TFB0412EHN series	12Vdc, 26.03(MIN. 23.40)CFM. See enclosure 04-10 for construction details.	UL 507	UL E132003 , --
30. Nameplate	Interchangeable	Interchangeable	Rated 100°C or better	UL 969	UL , --
31. Internal Wiring	Interchangeable	Interchangeable	Minimum 300V, Marked VW-1	UL 758	UL , --
32. Insulation sheet	FORMEX, DIV OF ILLINOIS TOOL WORKS INC	Formex GK series	Minimum 0.25mm thick, V-0, 115°C. See enclosure 04-12 for dimension figure.	UL94, UL746C	UL E121855 , --
33. Insulation tape stick on metal cover	3M COMPANY INDUSTRIAL ADHESIVES & TAPES DIV	926	Maximum 90°C, suitable for steel surface.	UL746C	UL MH17478 , --
34. Metal enclosure	--	--	See enclosure 04-11 for dimension figure.	--	-- , --
35. Heatsink on primary circuit	--	--	Aluminium alloy, approximately 136×37×26mm	--	-- , --

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
36. Heatsink on secondary circuit	--	--	Aluminium alloy, approximately 121×57×29mm	--	-- , --
37. Primary to Primary Relay K1	AMERICAN ZETTLER INC	AZ755 series	20A, 277Vac	UL508	UL E44211 , - -
37a. Primary to Primary Relay K1 – Alternate	AMERICAN ZETTLER INC	AZ576 series	20A, 480Vac	UL508	UL E44211 , - -
37b. Primary to Primary Relay K1 – Alternate	AMERICAN ZETTLER INC	AZ7555 series	20A, 277Vac	UL508	UL E44211 , - -
37c. Primary to Primary Relay K1 – Alternate	XIAMEN HONGFA ELECTROACOUS TIC CO LTD	HF14FW series	20A, 277Vac	UL508	UL E134517 , --

Supplementary information:

- 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.
- 2) Description line content is optional. Main line description needs to clearly detail the component used for testing
- 3) The CBTL has verified the component information

Enclosure

National Differences

Australia / New Zealand

EU Group and National Differences

Japan

USA / Canada

IEC 62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62368-1 (AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES (Audio/video, information and communication technology equipment)	
Differences according to	AS/NZS 62368.1:2022
TRF template used:	IECEE OD-2020-F3, Ed. 1.1
Attachment Form No.	AU_NZ_ND_IEC62368_1E
Attachment Originator	JAS-ANZ
Master Attachment	2022-07-01
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	National Differences		
Appendix ZZ	Variations to IEC 62368-1:2018 (ED. 3.0) for Australia and New Zealand		Pass
ZZ1 Scope	This Appendix lists the normative variations to IEC 62368-1:2018 (ED. 3.0)		Pass
ZZ2 Variations	The following modifications are required for Australian/New Zealand conditions:		Pass
2	After the first paragraph, <i>add</i> the following: The Australian or Australian/New Zealand Standards listed below are modified adoptions of, or not equivalent to, the IEC normative references and are required for the application of this Standard. All references in the source text to those IEC normative references shall be replaced by references to the corresponding Australian or Australian/New Zealand Standards. Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably -AS/NZS 3112, <i>Approval and test specification—Plugs and socket-outlets</i> -AS/NZS 3123, <i>Approval and test specification—Plugs, socket-outlets and couplers for general industrial application</i> -AS/NZS 3191, <i>Electric flexible cords</i> -AS/NZS 60884.1, <i>Plugs and socket-outlets for household and similar purposes, Part 1: General requirements</i> -IEC 60086-2 <i>Primary batteries — Part 2: Physical and electrical specifications</i> -AS/NZS 60065, <i>Audio, video and similar electronic apparatus—Safety requirements (IEC 60065:2015 (ED.8.0) MOD)</i> -AS/NZS 60320.1, <i>Appliance couplers for household and similar general purposes,</i>		Pass

IEC 62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<i>Part 1: General requirements (IEC 60320-1, Ed.2.1 (2007) MOD)</i> <i>-AS/NZS 60320.2.2, Appliance couplers for household and similar general purposes</i> <i>Part 2.2: Interconnection couplers for household and similar equipment (IEC 60320-2-2, Ed.2.0 (1998) MOD)</i> <i>-AS/NZS 60695.2.11, Fire hazard testing, Part 2.11: Glowing/hot wire based test methods—Glow-wire flammability test method for end-products</i> <i>-AS/NZS 60695.11.5, Fire hazard testing, Part 11.5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance</i> <i>-AS/NZS 60695.11.10, Fire hazard testing, Part 11.10: Test flames—50 W horizontal and vertical flame test methods</i> <i>-AS/NZS 60884.1, Plugs and socket-outlets for household and similar purposes, Part 1: General requirements</i> <i>-AS/NZS 60950.1, Information technology equipment—Safety, Part 1: General requirements (IEC 60950-1, Ed.2.2 (2013), MOD)</i> <i>IEC 61032:1997, Protection of persons and equipment by enclosures—Probes for verification</i> <i>-AS/NZS 61558.1, Safety of Power Transformers, Power Supplies, Reactors and Similar Products, Part 1: General requirements and tests (IEC 61558-1 Ed 3, MOD)</i> <i>-AS/NZS 61558.2.16, Safety of transformers, reactors, power supply units and similar products for voltages up to 1 100 V, Part 2.16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units.</i>		
4.7.2	Requirements Delete the text of the second paragraph and replace with the following: Equipment with a plug portion, suitable for insertion into a 10 A 3-pin flat-pin socket-outlet conforming to AS/NZS 3112, shall conform to the requirements in AS/NZS 3112 for equipment with integral pins for insertion into socket-outlets. Conformity is checked by inspection and, if necessary, by the tests in AS/NZS 3112. NOTE: Equipment with plug portions for use in countries other than Australia and New Zealand will need to conform to other countries' requirements Note Additional AS/NZS 3112 Appendix J, TRF is appended to end of this TRF.		N/A

IEC 62368_1E ATTACHMENT																							
Clause	Requirement + Test	Result - Remark		Verdict																			
4.7.3	Compliance Criteria <i>Delete</i> this clause			N/A																			
4.8.1	General After second list, <i>add</i> the following: NOTE: Refer to the Consumer Goods (Products Containing Button/Coin Batteries) Safety Standard 2020 and Consumer Goods (Products Containing Button/Coin Batteries) Information Standard 2020 for more information on button cell batteries in Australia..			N/A																			
5.4.10.2.1	General <i>Delete</i> the first paragraph and <i>replace</i> with the following: In Australia, the separation is checked by the test given in both Clause 5.4.10.2.2 and Clause 5.4.10.2.3. In New Zealand, the separation is checked by the test given in either 5.4.10.2.2 or 5.4.10.2.3..			N/A																			
Table 28	<i>Delete</i> Table 28 and <i>replace</i> with the following: <table><tr><th rowspan="2">Parts</th><th colspan="2">Impulse test</th><th colspan="2">Steady state test</th></tr><tr><th>New Zealand</th><th>Australia</th><th>New Zealand</th><th>Australia</th></tr><tr><td>Parts indicated in Clause 5.4.10.1 a) *</td><td>2.5 kV</td><td>7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment.</td><td>1.5 kV</td><td>3 kV</td></tr><tr><td>Parts indicated in Clause 5.4.10.1 b) and c) *</td><td colspan="2">1.5 kV *</td><td>1.0 kV</td><td>1.5 kV</td></tr></table> * Surge suppressors shall not be removed. * Surge suppressors may be removed, provided that such devices pass the impulse test of Clause 5.4.10.2.2 when tested as components outside the equipment. * During this test, it is allowed for a surge suppressor to operate and for a sparkover to occur in a GDT.			Parts	Impulse test		Steady state test		New Zealand	Australia	New Zealand	Australia	Parts indicated in Clause 5.4.10.1 a) *	2.5 kV	7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment.	1.5 kV	3 kV	Parts indicated in Clause 5.4.10.1 b) and c) *	1.5 kV *		1.0 kV	1.5 kV	N/A
Parts	Impulse test		Steady state test																				
	New Zealand	Australia	New Zealand	Australia																			
Parts indicated in Clause 5.4.10.1 a) *	2.5 kV	7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment.	1.5 kV	3 kV																			
Parts indicated in Clause 5.4.10.1 b) and c) *	1.5 kV *		1.0 kV	1.5 kV																			
5.4.10.2.2	<i>Delete</i> “NOTE” and <i>replace</i> with “NOTE 1”. After NOTE 1, <i>add</i> the following: NOTE 2: For Australia, the 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines. NOTE 3: For Australia, the value of 2.5 kV for Clause 5.4.10.1 a) was chosen to ensure the adequacy of the insulation concerned and does not necessarily simulate likely overvoltages.			N/A																			
5.4.10.2.3	<i>Delete</i> “NOTE” and <i>replace</i> with “NOTE 1”. After NOTE 1, <i>add</i> the following: NOTE 2: For Australia, where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used. NOTE 3: The 3 kV and 1.5 kV values for Australia have been determined considering the low frequency induced voltages from the power supply distribution system.			N/A																			
6	Electrically-caused fire																						
6.6	After Clause 6.6, <i>add</i> the new Clauses 6.201 as follows: 6.201 External power supplies, docking stations and other similar devices (see special national conditions)			N/A																			
8.6	Stability of equipment																						

IEC 62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Table 36	Footnote ^a , after first sentence, <i>add</i> the following: Equipment having displays with moving images shall include “television sets and display devices”.		N/A
8.6.1	After Clause 8.6.1 <i>add</i> the following new clauses: 8.6.201 Restraining Device fixing point (see special national conditions) 8.6.202 Restraining device (see special national conditions)		N/A
Annex F Paragraph F.3.3.4	Rated Voltage <i>Delete</i> “NOTE” and <i>replace</i> with NOTE1” After NOTE 1, <i>add</i> the following Equipment that is intended for connection to the supply mains in Australia and New Zealand shall be marked with: (a) A rated voltage of: • 230 V for single phase equipment • 400 V for poly phase equipment Or (b) A rated voltage range that includes: • 230 V for single phase equipment • 400 V for poly phase equipment NOTE 2: equipment that is not rated as above is not suitable for direct connection to the supply mains in Australia or new Zealand.		N/A
Annex F.3.3.5	After the list, <i>add</i> the following Equipment that is intended for connection to supply mains in Australia or New Zealand shall be marked with a rated frequency of 50 Hz or a rated frequency range or nominal value which includes 50Hz		N/A
Annex F.3.8	After “The DC output of an external power supply”, insert “or docking stations and other similar external devices”		N/A
Annex G Paragraph G.4.2	Mains connectors 1 After “IEC 60320”, insert “or AS/NZS 60320 series”. 2 After “IEC 60906-1”, insert “or AS/NZS 3123” 3 <i>After</i> first paragraph <i>add</i> the following: 10 A or 15 A 250 V flat pin plugs for the connection of equipment to mains-powered socket-outlets for household or similar general use shall comply with AS/NZS 3112 or AS/NZS 60884.1.		N/A
Paragraph G.5.3.1	Transformers, General 1 Third dashed point <i>replace</i> ‘IEC 61558-1 and the relevant parts of IEC 61558-2’ with ‘AS/NZS 61558-1 and the relevant parts of AS/NZS 61558.2’		N/A

IEC 62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	2 Fourth dashed point <i>replace</i> 'IEC 61558-2-16' with 'AS/NZS 61558.2.16'.		
Annex G.7.1	Mains supply cords, General Fourth dashed paragraph, <i>replace</i> 'IEC 60320-1' with 'AS/NZS 60320.1'		N/A
Table G.7	Sizes of conductors 1 First column, second row, <i>delete</i> "6" and <i>replace</i> with "7.5" 2 Second column, second row, <i>delete</i> '0,75' and <i>replace</i> with '0.75 ^b 3 <i>Delete</i> NOTE 1. 4 <i>Replace</i> 'NOTE 2' with 'NOTE:'. 5 <i>Delete</i> 'Footnote b' and <i>replace</i> with the following: ^b This nominal cross-sectional area is only allowed for Class II appliances if the length of the power supply cord, measured between the point where the cord, or cord guard, enters the appliance, and the entry to the plug does not exceed 2 m (0.5 mm ² three-core supply flexible cords are not permitted; see AS/NZS 3191). 6 Footnote c <i>replace</i> 'IEC 60320-1' with 'AS/NZS 60320.1' 7 Footnote d <i>replace</i> 'IEC 60320-1' with 'AS/NZS 60320.1'		N/A
Annex M M 2.1	<i>Add</i> "IEC 60086-2" to the list		N/A
Annex M Paragraph M.3.2	Test method <i>Delete</i> "NOTE" and <i>replace</i> with "NOTE 1" After NOTE 1 <i>add</i> the following: NOTE 2: In cases where the voltage source is provided by power from an unassociated power source, consideration should be given to the effects of possible single fault conditions in the unassociated equipment. If the power source is unknown then it should be assumed that the maximum limit of ES1 may be applied to the source input under assumed single fault conditions in the source when assessing the charging circuit in the equipment under test.		N/A
	Special national conditions (if any)		
6.201	External power supplies, docking stations and other similar devices For external power supplies, docking stations and other similar devices, during and after abnormal operating conditions and during single fault conditions the output voltage— (a) at all ES1 outlets or connectors shall not increase by more than 10 % of the output rated voltage under normal operating conditions, measured after 3 s of introducing a single fault condition and		N/A

IEC 62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	after 3 s of introducing abnormal operating conditions; and (b) of a USB outlet or connector shall not increase by more than 3 V or 10 % of the output rated voltage under normal operating conditions, whichever is higher, measured after 3 seconds of introducing a single fault condition and after 3 s of introducing abnormal operating conditions For equipment with multiple rated voltages at the output, the requirements apply with the equipment configured for each output rated voltage in turn NOTE: This is intended to reduce the possibility of battery fire or explosion in attached equipment or accessories when charging secondary lithium batteries. The 3 s measurement delay is based on IEC document 108/742/INF, <i>TC 108, Standards Interpretation Panel Question 15 — Output voltage</i>, in relation to similar requirements in IEC 62368-3:2017. Conformity shall be checked by measurement, taking into account the abnormal operating conditions of Annex B.3 and the simulated single fault conditions of Annex B.4.		
8.6.201	Restraining device fixing point Freestanding-capable MS2 and MS3 television sets and display devices shall be provided with a fixing point to facilitate the anchoring of the equipment from toppling The fixing point shall conform to Clause 8.7 where the fixing point uses a wall, ceiling or other structure mount. Alternatively, the fixing point shall be capable of withstanding a pull equal to the mass of the equipment in all directions without damage Instructions for installation or instructions for use shall be provided to specify correct use of the fixing point		N/A
8.6.202	Restraining device MS2 and MS3 television sets and display devices shall be provided with a restraining device and associated hardware to attach to the television set or display device. The restraining device shall be capable of withstanding a pull equal to the mass of the equipment in all directions.		N/A

IEC 62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Instructions for installation or instructions for use shall be provided to specify correct use of the fixing point		

IEC 62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT AS_NZS_3112:2017_+A1:2021 Appendix J AUSTRALIAN / NEW ZEALAND NATIONAL DIFFERENCES (Approval and test specification—Plugs and socket-outlets)			
Differences according to: AS_NZS_3112:2017_Amendment 1:2021_Appendix J			
TRF template used:: IEC EE OD-2020-F3, Ed. 1.1			
Attachment Form No.: AS_NZS_3112:2017_Appendix J			
Attachment Originator: JAS-ANZ			
Master Attachment: 2022-06			
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	Note: AS/NZS 3112 is NOT covered by IECEE Accreditation for Testing / Reporting Please State Laboratory Accreditation for this Standard		
	Accreditation		
	Accreditation Stamp		

J1 SCOPE	General: This Appendix specifies additional dimensional and constructional requirements for detachable plug portions, or equipment incorporating integral supply pins or equipment incorporating detachable plug portions. This Appendix shall be read in conjunction with Section 2 of this Standard. For the purposes of this Appendix, where the term 'plug' is used in Section 2 it shall be taken to mean the plug portion of equipment or the detachable plug portion. The equipment shall comply with the relevant product Standard. The tests and requirements specified in this Appendix are in addition to any test and requirements of the relevant product Standard for the equipment. (AS/NZS 3112:2017/A1:2021)	N/A
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IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT	
IEC 62368-1	
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES	
(Audio/video, information and communication technology equipment - Part 1: Safety requirements)	
Differences according to	EN IEC 62368-1:2020+A11:2020
Attachment Form No.	EU_GD_IEC62368_1E
Attachment Originator	UL(Demko)
Master Attachment	2021-02-04
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	CENELEC COMMON MODIFICATIONS (EN)		
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed “Z”.		
	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords		
1	Modification to Clause 3 .		
3.3.19	Sound exposure <i>Replace 3.3.19 of IEC 62368-1 with the following definitions:</i>		Pass
3.3.19.1	momentary exposure level, MEL metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2. Note 1 to entry: MEL is measured as A-weighted levels in dB. Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.		Pass
3.3.19.3	sound exposure, E A-weighted sound pressure (<i>p</i>) squared and integrated over a stated period of time, <i>T</i> Note 1 to entry: The SI unit is Pa² s.		Pass

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Clause	Requirement + Test	Result - Remark	Verdict
	$E = \int_0^T p(t)^2 dt$		
3.3.19.4	sound exposure level, SEL logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans. Note 1 to entry: <i>SEL</i> is measured as A-weighted levels in dB. $SEL = 10 \lg \left(\frac{E}{E_0} \right) \text{ dB}$ Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.		Pass
3.3.19.5	digital signal level relative to full scale, dBFS levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.		Pass
2	Modification to Clause 10		
10.6	Safeguards against acoustic energy sources Replace 10.6 of IEC 62368-1 with the following:		N/A
10.6.1.1	Introduction Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an ordinary person, that: – is designed to allow the user to listen to audio or audiovisual content / material; and – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible. Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: – professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment. – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music players: • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder; NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. – a player while connected to an external amplifier that does not allow the user to walk around		

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Clause	Requirement + Test	Result - Remark	Verdict
	while in use. For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply. The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.		
10.6.1.2	Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body mounted devices, attention is drawn to EN 50360 and EN 50566.		N/A
10.6.2	Classification of devices without the capacity to estimate sound dose		N/A
10.6.2.1	General This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3. For classifying the acoustic output $LA_{eq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term $LA_{eq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, T becomes the duration of the song. NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term $LA_{eq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	given as long as the average sound pressure of the song does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dB.		
10.6.2.2	RS1 limits (to be superseded, see 10.6.3.2) RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2.		N/A
10.6.2.3	RS2 limits (to be superseded, see 10.6.3.3) RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed “programme simulation noise” as described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed “programme simulation noise” as described in EN 50332-1.		N/A
10.6.2.4	RS3 limits RS3 is a class 3 acoustic energy source that exceeds RS2 limits.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.3	Classification of devices (new)		N/A
10.6.3.1	General Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below.		N/A
10.6.3.2	RS1 limits (new) RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.		N/A
10.6.3.3	RS2 limits (new) RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.		N/A
10.6.4	Requirements for maximum sound exposure		N/A
10.6.4.1	Measurement methods		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		
10.6.4.2	Protection of persons Except as given below, protection requirements for parts accessible to ordinary persons, instructed persons and skilled persons are given in 4.3. NOTE 1 Volume control is not considered a safeguard. Between RS2 and an ordinary person, the basic safeguard may be replaced by an instructional safeguard in accordance with Clause F.5, except that the instructional safeguard shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the instructional safeguard may be given through the equipment display during use. The elements of the instructional safeguard shall be as follows:  – element 1a: the symbol , IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording An equipment safeguard shall prevent exposure of an ordinary person to an RS2 source without intentional physical action from the ordinary person and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off. The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A skilled person shall not be unintentionally exposed to RS3.		
10.6.5	Requirements for dose-based systems		N/A
10.6.5.1	General requirements Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause. The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration. The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.		N/A
10.6.5.2	Dose-based warning and requirements When a dose of 100 % CSD is reached, and at least at every 100 % further increase of CSD, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1. The warning shall at least clearly indicate that listening above 100 % CSD leads to the risk of hearing damage or loss.		N/A
10.6.5.3	Exposure-based requirements With only dose-based requirements, cause and effect could be far separated in time, defying the		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at. The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3. The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster. Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than -10 dBFS for a digital interface. NOTE In case the source is known not to be music (or test signal), the EL may be disabled.		
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	Corded listening devices with analogue input With 94 dB LAeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV. NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.		N/A
10.6.6.2	Corded listening devices with digital input With any playing device playing the fixed “programme simulation noise” described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the LAeq,T acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A

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Clause	Requirement + Test			Result - Remark		Verdict
10.6.6.3	Cordless listening devices In cordless mode, – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.					N/A
10.6.6.4	Measurement method <i>Measurements shall be made in accordance with EN 50332-2 as applicable.</i>					N/A
3	Modification to the whole document					
	Delete all the “country” notes in the reference document according to the following list:					
	0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1	Note 2
	3.3.8.3	Note 1	4.1.15	Note	4.7.3	Note 1 and 2
	5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4	Note 1 and 3
	5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1	Note
	5.4.10.2.1	Note	5.4.10.2.2	Note	5.4.10.2.3	Note
	5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3 and 4
	5.6.8	Note 2	5.7.6	Note	5.7.7.1	Note 1 and Note 2
	8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3	Note 2
	10.6.4	Note 3	F.3.3.6	Note 3	Y.4.1	Note
	Y.4.5	Note				
4	Modification to Clause 1					
1	Add the following note:					N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<i>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.</i>		
5	Modification to 4.Z1		
4.Z1	Add the following new subclause after 4.9: To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		N/A
6	Modification to 5.4.2.3.2.4		
5.4.2.3.2.4	Add the following to the end of this subclause: The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.		N/A
7	Modification to 10.2.1		
10.2.1	Add the following to ^{c)} and ^{d)} in table 39: For additional requirements, see 10.5.1.		N/A
8	Modification to 10.5.1		
10.5.1	Add the following after the first paragraph: For RS 1 compliance is checked by measurement under the following conditions: In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made. NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus. Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made. For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level. NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.		
9	Modification to G.7.1		
G.7.1	Add the following note: NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		N/A
10	Modification to Bibliography		
	Add the following notes for the standards indicated: IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.		
11	ADDITION OF ANNEXES		

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Clause	Requirement + Test	Result - Remark	Verdict
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		
4.1.15	Denmark, Finland, Norway and Sweden To the end of the subclause the following is added: Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Denmark: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.” In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: “Apparatet må tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag”		N/A
4.7.3	United Kingdom To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex		N/A
5.2.2.2	Denmark After the 2nd paragraph add the following: A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A
5.4.11.1 and Annex G	Finland and Sweden To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either two layers of thin sheet material, each of which shall pass the electric strength test below, or		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition - passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and - is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; - the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
5.5.2.1	Norway After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A
5.5.6	Finland, Norway and Sweden		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	To the end of the subclause the following is added: Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2.		
5.6.1	Denmark Add to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. <i>Justification:</i> In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.		N/A
5.6.4.2.1	Ireland and United Kingdom After the indent for pluggable equipment type A, the following is added: – the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.		N/A
5.6.4.2.1	France After the indent for pluggable equipment type A, the following is added: – in certain cases, the protective current rating of the circuit supplied from the mains is taken as 20 A instead of 16 A.		N/A
5.6.5.1	To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm² to 1,5 mm² in cross-sectional area.		N/A
5.6.8	Norway To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as class I equipment. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.		N/A
5.7.6	Denmark To the end of the subclause the following is added:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		
5.7.6.2	Denmark To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .		N/A
5.7.7.1	Norway and Sweden To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)” NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	utstyr – og er tilkople et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.” Translation to Swedish: ”Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.”.		
8.5.4.2.3	United Kingdom Add the following after the 2nd dash bullet in 3rd paragraph: An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.		N/A
B.3.1 and B.4	Ireland and United Kingdom The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4 are met		N/A
G.4.2	Denmark To the end of the subclause the following is added: Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a <i>Justification:</i> Heavy Current Regulations, Section 6c		
G.4.2	United Kingdom To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
G.7.1	United Kingdom To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
G.7.1	Ireland To the first paragraph the following is added:		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		
G.7.2	Ireland and United Kingdom To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm ² is allowed for equipment which is rated over 10 A and up to and including 13 A.		N/A
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		
10.5.2	Germany The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. <i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de		N/A
ZD	IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)		

IEC62368_1E – ATTACHMENT								
Clause	Requirement + Test	Result - Remark	Verdict					
	<table><tr><th rowspan="2">Type of flexible cord</th><th colspan="2">Code designations</th></tr><tr><th>IEC</th><th>CENELEC</th></tr></table>		Type of flexible cord	Code designations		IEC	CENELEC	
	Type of flexible cord	Code designations						
		IEC	CENELEC					
	PVC insulated cords							
	Flat twin tinsel cord	60227 IEC 41	H03VH-Y					
	Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F					
	Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F					
	Rubber insulated cords							
	Braided cord	60245 IEC 51	H03RT-F					
	Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F					
	Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F					
	Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F					
	Cords having high flexibility							
	Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H					
	Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H					
	Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H					
	Cords insulated and sheathed with halogen-free thermoplastic compounds							
	Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F					
	Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F					

ATTACHMENT to TRF IEC62368_1E			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62368-1:2018 JAPAN NATIONAL DIFFERENCES Audio/video, information and communication technology equipment – Part 1: Safety requirements			
Differences according to: J62368-1(2023)			
TRF template used: IECEE OD-2020-F3:2022, Ed. 1.2			
Attachment Form No.: JP_ND_IEC62368_1E			
Attachment Originator: UL Solutions (JP)			
Master Attachment: Dated 2023-05-12			
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	National Differences		
4.1.2	Where the component, or a characteristic of a component, is a safeguard or a part of a safeguard, components shall comply with the requirements of this document or, where specified in a requirements clause, with the safety aspects of the relevant JIS component standards or IEC component standards, or components shall have properties equivalent to or better than these.		N/A
5.6.1	Mains socket-outlet and interconnection coupler shall comply with Clause G.4.2A if they are incorporated as part of the equipment.		N/A
5.6.2.1	Connection for protective conductor of class 0I equipment provided with instructional safeguard in accordance with Clause F.3.6.1A is considered to make earlier and break later than supply connection. Mains plug having a lead wire for protective earthing connection of class 0I equipment shall comply with all of the following: – Not to be used for equipment having a rated voltage of 150 V or more – Clip is not used for the earthing connection of the lead wire. – The lead wire for earthing is at least 10 cm long If class 0I equipment provides an independent main protective earthing terminal and is intended to be		N/A

ATTACHMENT to TRF IEC62368_1E			
Clause	Requirement + Test	Result - Remark	Verdict
	installed by ordinary person, earthing wire shall be provided in the package of the equipment.		
5.6.2.2	Internal earthing conductor of the cord set that is covered by the sheath of mains cord and is formed together with mains plug and appliance connector need not be green-and-yellow.		N/A
5.6.3	In case of class 0I equipment using power supply cord having two conductors (no earthing conductor), the conductor of protective earthing lead wire shall comply with either of the following: – use of annealed copper wire with 1.6 mm diameter or corrosion-inhibiting metal wire having size and strength that are equivalent to or more than the above copper wire – single core cord or single core cable with 1.25 mm ² or more cross-sectional area		N/A
5.7.3	For class 0I equipment that is provided with mains socket-outlet in the configuration as specified in JIS C 8282 series, JIS C 8300 or JIS C 8303, or that is provided with mains appliance outlet as specified in JIS C 8283 series for the purpose of interconnection, the measurement is conducted on the system of the interconnected equipment having a single connection to the mains.		N/A
5.7.5	In case of class 0I equipment, touch current shall not exceed 1.41 mA peak or for sinusoidal wave, 1.0 mA r.m.s. when measured using the network specified in Figure 4 of IEC 60990:2016.		N/A
6.4.3.2	A fuse complying with JIS C 6575 series or a fuse having equivalent characteristics shall open within 1 s. A fuse having time/current characteristics other than those specified in IEC 60127 shall be tested with the characteristics taken into account. In case of Class A fuse of JIS C 6575, replace “2.1 times” by “1.35 times” and in case of Class B fuse of JIS C 6575, replace “2.1 times” by “1.6 times”.		N/A
8.5.4.3.1	Only three-phase stationary equipment rated more than AC 200 V can be considered as being for use in locations where children are not likely to be present, when complying with Clause F.4.		N/A
8.5.4.3.2	For equipment installed where children may be present, an instructional safeguard shall be provided by easily understandable wording in accordance with Clause F.5, except that element 3 is optional.		N/A
8.5.4.3.4	The media destruction device is tested according to Clause V.1.2 with applicable jointed test probes to		N/A

ATTACHMENT to TRF IEC62368_1E			
Clause	Requirement + Test	Result - Remark	Verdict
	the opening. And then the wedge probe per Figure V.4 shall not contact any moving part.		
8.5.4.3.5	The wedge probe of Figure V.4 and applicable jointed test probes specified in Clause V.1.2 shall not contact any moving part. Instructional safeguard shall not be used instead of equipment safeguard for preventing access to hazardous moving parts.		N/A
F.3.5.1	When the mains socket-outlet is configured in accordance with JIS C 8282 series, JIS C 8300 or JIS C 8303, the assigned current or power shall be marked. If the voltage of the socket-outlet is the same as the mains voltage, the voltage need not be marked. Instructional safeguard of Class 0I equipment shall be provided with an instructional safeguard in accordance with Clause F.5 when a mains socket-outlet as specified in JIS C 8282 series, JIS C 8300 or JIS C 8303 to which class I equipment can be connected is provided in accordance with Clause G.4.2A except for the cases where the socket-outlet is accessible only to skilled persons.		N/A
F.3.5.3	If the fuse is necessary for the safeguard function, the symbols indicating pre-arcing time-current characteristic shall be included.		N/A
F.3.6.1A	Marking for class 0I equipment The requirements of Clauses F.3.6.1.1 and F.3.6.1.2 shall be applied to class 0I equipment. For class 0I equipment, a marking of instructions shall be provided regarding the earthing connection. In addition to the above, for class 0I equipment, an instruction to connect earthing before and disconnect earthing after the connection of supply conductors shall be marked on the visible place of the main body or shall be in the text of an accompanying document.		N/A
F.3.6.2	Symbols, IEC 60417-5172 (2003-02) or IEC 60417-6092 (2011-10), shall not be used for class I equipment or class 0I equipment.		N/A
F.3.8A	Attention marking for aging deterioration of CRT television Year of manufacture, standard usage period by design according to JIS C 9921-5 and cautionary statement for possible risks of aging deterioration when used beyond the specified period shall be		N/A

ATTACHMENT to TRF IEC62368_1E			
Clause	Requirement + Test	Result - Remark	Verdict
	marked on CRT television except for industrial use CRT television.		
F.4	For audio equipment with terminals classified as ES3 in accordance with Table E.1, and for other equipment with terminals marked in accordance with F.3.6.1 and F.3.6.1A, the instructions shall require that the external wiring connected to these terminals shall be installed by a skilled person, or shall be connected by means of ready-made leads or cords that are constructed in a way that would prevent contact with any ES3 circuit. For class 0I equipment provided with independent main protective earthing terminal, where the cord for the protective earthing connection is not provided in the package of the equipment, if the protective earthing connection is made by instructed person or skilled person, the suitable installation instruction for the protective earthing connection shall be provided.		N/A
G.3.2.1	The thermal link when tested as a separate component, shall comply with the requirements of JIS C 6691 or have properties equivalent to or better than that.		N/A
G.3.4	Except for devices covered by Clause G.3.5, overcurrent protective devices used as a safeguard shall comply with the applicable JIS or IEC standard in accordance with 4.1.2 or shall have equivalent or better properties. Such a protective device shall have adequate breaking (rupturing) capacity to interrupt the maximum fault current (including short-circuit current) that can flow.		N/A
G.4.1	This requirement does not apply to connectors covered in Clauses G.4.2 and G.4.2A.		N/A
G.4.2	Mains connectors, mains plugs and socket-outlets shall comply with JIS C 8283 series, JIS C 8285, IEC 60309 series, JIS C 8282 series, JIS C 8300, JIS C 8303, or have equivalent or better properties. A power supply cord set provided with appliance connector that can fit appliance inlet complying with JIS C 8283-1 shall comply with JIS C 8286. Construction shall prevent mechanical stress not to transmit to the soldering part of appliance inlet terminal. When an equipment is rated not more than 125 V and all of the following are met, Type C14 and C18 appliance inlet complying with JIS C 8283-3 can be considered as rated 15 A.		N/A

ATTACHMENT to TRF IEC62368_1E			
Clause	Requirement + Test	Result - Remark	Verdict
	– The temperature of appliance inlet does not exceed the value specified in JIS C 8283-1 under the most unfavourable normal operating condition as specified in Clause B.2.1. – "Use only designated cord set attached in this equipment" or equivalent text is described in the operating instruction. If the cord set is not provided in the package of the equipment, suitable information regarding to the cord set is described in the operating instruction.		
G.4.2A	Mains socket-outlet and interconnection coupler provided with the class II, class I and class 0I equipment respectively		N/A
G.7.1	A mains supply cord need not include the protective earthing conductor for class 0I equipment provided with independent protective earthing conductor.		N/A
G.7.2 Table G.7	Cross-sectional area of equipment rated up to and including 3 A shall be 0.75 mm ² .		N/A
G.7.6.1 Table G.9	The cross-sectional area of mains cords according to JIS C 3010 may comply with relevant Japanese wiring regulation. For cables other than those complying with JIS C 3662 series or JIS C 3663 series, the terminals shall be suitable for the size of the intended cables.		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62368-1 U.S.A. AND CANADA NATIONAL DIFFERENCES (Audio/video, information and communication technology equipment – Part 1: Safety requirements)	
Differences according to.....:	CSA/UL 62368-1:2019
TRF template used.....:	IECEE OD-2020-F3, Ed. 1.1
Attachment Form No.....:	US_CA_ND_IEC62368_1E
Attachment Originator.....:	UL(US)
Master Attachment.....:	Dated 2022-03-04
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IEC 62368-1 - US and Canadian National Differences Special National Conditions based on Regulations and Other National Differences			
1 (1DV.1) (1.3)	All equipment is to be designed to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part 1, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, for such equipment marked or otherwise identified, installation is allowed per the Standard for the Protection of Information Technology Equipment, ANSI/NFPA 75.	Complies	Pass
1 (1DV.2.1)	This standard includes additional requirements for equipment used for entertainment purposes intended for installation in general patient care areas of health care facilities. See Annex DVB.		N/A
1 (1DV.2.2)	This standard includes additional requirements for equipment intended for mounting under cabinets. See Annex DVC.		N/A
1 (1DV.2.3)	IEC 62368-3 clause 5 for DC power transfer at ES1 or ES2 voltage levels is considered informative. IEC 62368-3 clause 6 for remote power feeding telecommunication (RFT) circuits is considered normative (see ITU K.50). Alternatively, equipment with RFT circuits are given in either UL 2391 or CSA/UL 60950-21. RFT-C circuits are not permitted unless the RFT-C circuit complies with RFT-V limits ($\leq 200V$ per conductor to earth).		N/A
1 (1DV.3)	For protection against direct lightning strikes, reference is made to NFPA 780 and CAN/CSA-B72 for additional requirements.		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
1 (1DV.5)	Additional requirements apply to some forms of power distribution equipment, including sub-assemblies.		N/A
4.1 (4.1.17)	For lengths exceeding 3.05 m, external interconnecting cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the NEC.		N/A
	For lengths 3.05 m or less, external interconnecting cable assemblies that are not types specified in the NEC generally are required to have special construction features and identification markings.		N/A
4.6 (4.6.2)	Wire-wrap terminals have special construction and performance requirements.		N/A
4.8 (4.8.3, 4.8.4.5, 4.8.5)	Coin / button cell batteries have modified special construction and performance requirements.		N/A
5.4.2.3.2 (5.4.2.3.2.1)	Surge Arrestors and Transient Voltage Surge Suppressors installed external to the equipment are required to comply with the appropriate NEC and CEC requirements.		Pass
5.5.9	Receptacles, rated 125-V, single phase, 15- or 20-A accessible to either ordinary, instructed, or skilled persons are required to be provided with GFCI Protection for Personnel if the equipment containing the receptacles is installed outdoors. The protection devices are required to comply with UL 943, and CAN/CSA C22.2 No.144.		N/A
5.6.3	Protective earthing conductors comply with the minimum conductor sizes in Table G.7, except as required by Table G.7ADV.1 for cord connected equipment, or Annex DVH for permanently connected equipment.	To be evaluated in the end product	N/A
5.7.8 (5.7.8.1)	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.		N/A
6.5.1	PS3 wiring outside a fire enclosure is required to comply with single fault testing in B.4, or be current limited per one of the permitted methods.		N/A
Annex F (F.3.3.9)	Output terminals provided for supply of other equipment, except mains supply, are required to be marked with a maximum rating or reference to equipment permitted to be connected.		N/A
Annex F (F.3.7)	Outdoor Enclosures are required to be classified and marked in accordance with UL 50 or 50E, or CAN/CSA C22.2 No. 94.1 or 94.2.		N/A
Annex G (G.7)	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.		N/A
	Flexible power supply cords are required to be compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC.		N/A
	Minimum cord length is required to be 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement. Power supply cords are required to be no longer than 4.5 m in length if used in ITE Rooms.		N/A
	Power supply cords for outdoor equipment are required to be suitable outdoor use type as required by Section 400.4 of the NEC and Rule 4-012 of the CEC, i.e., marked "W."		N/A
Annex H.2	Continuous ringing signals under normal operating conditions up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.		N/A
Annex H.4	For circuits with other than ringing signals and with voltages exceeding 42.4 V _{peak} or 60 V _{d.c.} , the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.		N/A
Annex Q (Q.3)	Equipment with paired conductor and/or coax communications cables/wiring connected to building wiring are required to have special voltage, current, power and marking requirements.		N/A
Annex DVA (1)	Equipment that is designed such that it may be powered from a separate electrical service, is required to meet applicable requirements for service equipment for control and protection of services and their installation and complies with Article 230 of the National Electrical Code (NEC), NFPA 70 and Section 6 of the Canadian Electrical Code, Part I, CSA C22.1.		N/A
	Equipment intended for use in spaces used for environmental air (plenums) are subjected to special flammability requirements for heat and visible smoke release.		N/A
	For ITE room applications, automated information storage systems with combustible media greater than 0.76 m ³ (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.		N/A
	Consumer products designed or intended primarily for children 12 years of age or younger are subject to additional requirements in accordance with U.S. and Canadian Regulations.		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors.		N/A
	Storage batteries and battery management equipment, other than associated with lead-acid batteries, and including battery backup systems that are not an integral part of stationary AV and ICT equipment, such as provided in separate cabinets, are required to be certified (listed) to the appropriate standard(s) for such storage batteries and equipment.		N/A
Annex DVA (5.6)	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.		N/A
Annex DVA (6.3)	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.		N/A
Annex DVA (6.4.8)	For ITE room applications, enclosures with combustible material measuring greater than 0.9 m ² (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For equipment with the same dimensions for other applications, an external surface that is not a fire enclosure requires a minimum flammability classification of V-1.		N/A
Annex DVA (10.3)	Equipment with lasers is required to meet the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
Annex DVA (10.5)	Equipment that produces ionizing radiation is required to comply with the U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
Annex DVA (F.3.3.4)	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. Additional considerations apply for voltage ratings that exceed the attachment cap rating or that are lower than the "Normal Operating Condition" in Table 2 of CAN/CSA C22.2 No. 235."		N/A
Annex DVA (F.3.3.6)	Equipment identified for ITE (computer) room installation is required to be marked with the rated current.		N/A
Annex DVA (G.1)	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position, where mounted in an enclosure, vertically mounted disconnect switches and circuit breakers with vertical operating means extending outside the enclosure are required to indicate in a location visible when accessing the external operating means whether the switch or circuit breaker is in the open (off) or closed (on) position.		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVA (G.3.4)	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.		N/A
	Where a fuse is used to provide Class 2 or Class 3 current limiting, it is not operator-accessible unless it is non- interchangeable.		N/A
Annex DVA (G.4.2)	Equipment with isolated ground (earthing) receptacles is required to comply with NEC 250.146(D) and CEC 10-400 and 10-612.		N/A
Annex DVA (G.4.3)	Interconnection of units by conductors supplied by a limited power source, or a Class 2 circuit defined in the NEC/CEC may have field wiring connections other than specified in DVH.3, such as wire-wrap and crimp-on types, if the limited power source and Class 2 circuits are separated from all other circuits by barriers, routing or fixing.		N/A
Annex DVA (G.5.3)	Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require special transformer overcurrent protection.		N/A
Annex DVA (G.5.4)	Motor control devices are required for cord-connected equipment with a mains-connected motor if the equipment is rated more than 12 A, or if the equipment has a nominal voltage rating greater than 120 V, or if the motor is rated more than 1/3 hp (locked rotor current over 43 A).		N/A
Annex DVA (G.7)	Flexible cords used outdoors are required to have the suffix “W” marked on the flexible cord.		N/A
Annex DVA (M)	For ITE room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the ITE room remote power-off circuit.		N/A
Annex DVA (Q)	If applicable per NEC 725.121(C), some limited power sources supplied from AV/ICT equipment are required to have a label indicating the maximum voltage and rated current output per conductor for each connection point. Where multiple connection points have the same rating, a single label is permitted to be used.		N/A
	Wiring terminals intended to supply Class 2 outputs in accordance with the NEC or CEC Part 1 are required to be marked with the voltage rating and “Class 2” or equivalent. The marking is located adjacent to the terminals and visible during wiring.		N/A
	Applicable parts of Chapter 8 of the NEC, and Rules 54 and 60 of the CEC, may be applicable to ITE installed outdoors with connections to communication systems.		N/A
Annex DVB (1)	Additional requirements apply for equipment used for entertainment purposes intended for		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	installation in general patient care areas of health care facilities.		
Annex DVC (1)	Additional requirements apply for equipment intended for mounting under kitchen cabinets.		N/A
Annex DVE (4.1.1)	Some equipment, components, sub-assemblies and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. These equipment and components include: appliance couplers, attachment plugs, battery backup systems, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), direct plug-in equipment, electrochemical capacitor modules (energy storage modules with ultracapacitors), enclosures (outdoor), flexible cords and cables, fuses (branch circuit), ground-fault current interrupters, interconnecting cables, modular data centers, power supply cords, some power distribution equipment, printed wiring, protectors for communications circuits, receptacles, surge protective devices, vehicle battery adapters, wire connectors, and wire and cables.		N/A
Annex DVH	Equipment for permanent connection to the mains supply is subjected to additional requirements.		N/A
Annex DVH (DVH.1)	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains are required to be in accordance with the NEC/CEC.		N/A
Annex DVH (DVH.2.1)	For safe and reliable connection to a mains, permanently connected equipment is to be provided.		N/A
Annex DVH (DVH.2.2)	Additional considerations for D.C. mains.		N/A
Annex DVH (DVH.3.2.1)	Terminals for permanent wiring, including protective earthing terminals, are required to be suitable for U.S./Canadian wire gauge sizes, rated 125 percent of the equipment rating, and be specially marked when specified.		N/A
Annex DVH (DVH.3.2.3)	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm ²).		N/A
Annex DVH (DVH.3.2.4)	All associated mains supply terminals are located in proximity to each other and to the main protective earthing terminal, if any.		N/A
Annex DVH (DVH.3.2.5)	Terminals are located, guarded or insulated so that, should a strand of a conductor escape when the conductor is fitted, there is no likelihood of accidental contact between such a strand and accessible conductive parts or unearthed conductive parts separated from accessible conductive parts by supplementary insulation only.		N/A

IEC62368_1E – ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVH (DVH.3.3)	When field connection to an external circuit is via wires (example, free conductors), the wires are not smaller than 18 AWG (0.82 mm ²) and the free length of the wire inside an outlet box or wiring compartment is 150 mm or more.		N/A
Annex DVH (DVH.3.4)	Size of protective earthing conductors and terminals	(See sub-clause 5.6.5)	N/A
Annex DVH (DVH.4)	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.		N/A
Annex DVH (DVH.4.1)	Wire bending space		N/A
Annex DVH (DVH.4.2)	Volume of wiring compartment		N/A
Annex DVH (DVH.4.3)	Separation of circuits		N/A
Annex DVH (DVH.5)	Equipment markings and instructional safeguards		N/A
Annex DVH (DVH.5.1)	Identification of protective earthing terminal		N/A
Annex DVH (DVH.5.2)	Identification of terminal for earthed conductor (neutral)		N/A
Annex DVH (DVH.5.3)	Identification of terminals for aluminium conductors		N/A
Annex DVH (DVH.5.4)	Wire temperature ratings		N/A
Annex DVH (DVH.5.5)	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, is required to comply with special earthing, wiring, marking and installation instruction requirements.		N/A
Annex DVI (6.7)	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses.		N/A
Annex DVJ (10.6.1)	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.		N/A

Enclosures

Enclosures

Type	Supplement Id	Description
Photographs	03-01	Overall View - Connector Side
Photographs	03-02	Overall View - Fan Side
Photographs	03-03	Internal View 1
Photographs	03-04	Internal View 2
Photographs	03-05	Trace - Main Board
Photographs	03-06	Trace - PFC/Bias Control Board
Diagrams	04-01	Specification of Inductor L1
Diagrams	04-02	Specification of Inductor L2
Diagrams	04-03	Specification of Inductor L3
Diagrams	04-04	Specification of Inductor L4
Diagrams	04-05	Specification of Inductor L5
Diagrams	04-06	Specification of Inductor L6
Diagrams	04-07	Specification of Inductor L7
Diagrams	04-08	Specification of Transformer T2, T3, T5
Diagrams	04-09	Specification of Transformer T4
Diagrams	04-10	Specification of DC fan
Diagrams	04-11	Dimension of metal enclosure
Diagrams	04-12	Dimension of insulation sheet
Schematics + PWB	05-01	PWB layout

Enclosures

Photographs ID 03-01



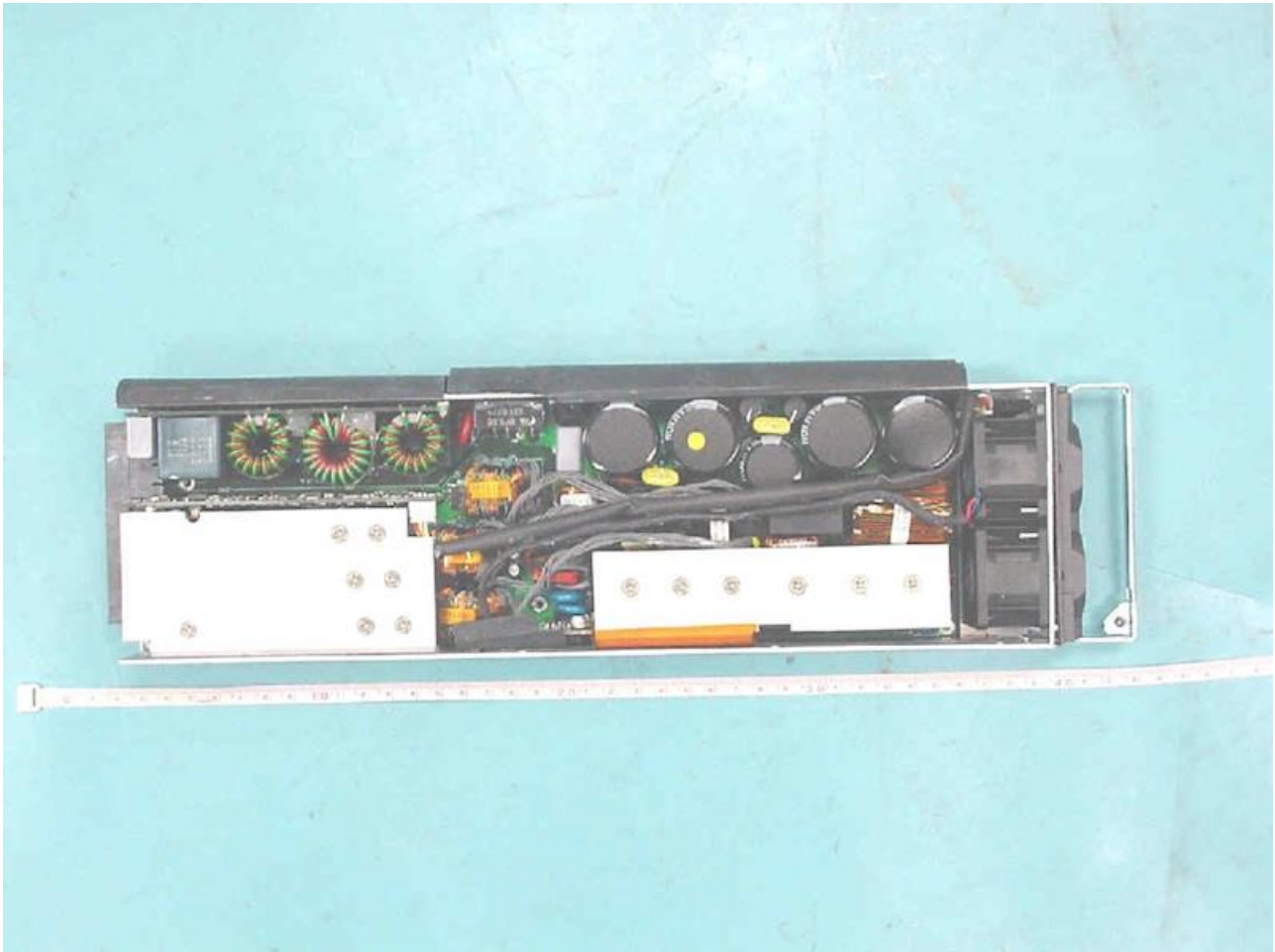
Enclosures

Photographs ID 03-02



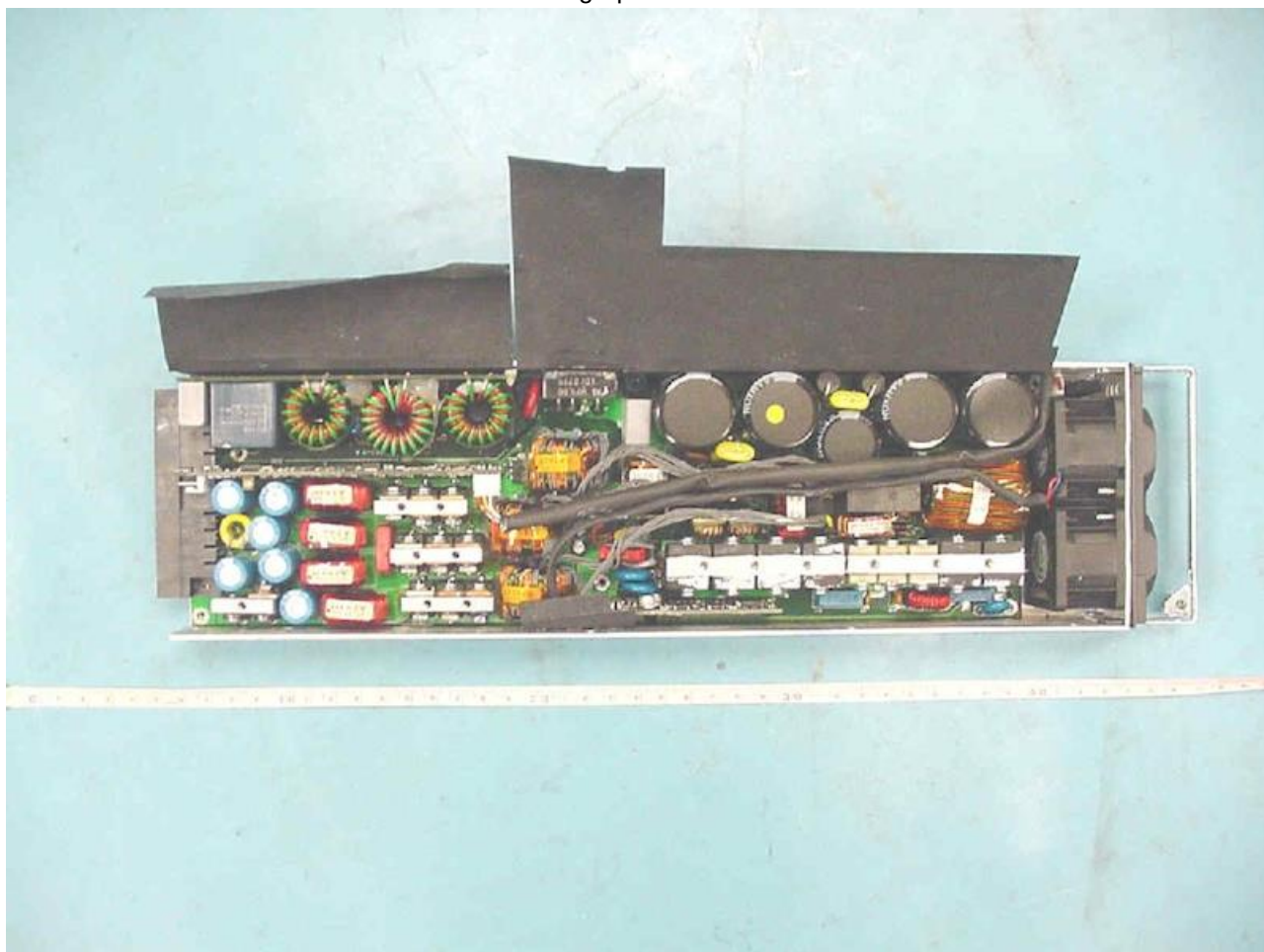
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Photographs ID 03-03



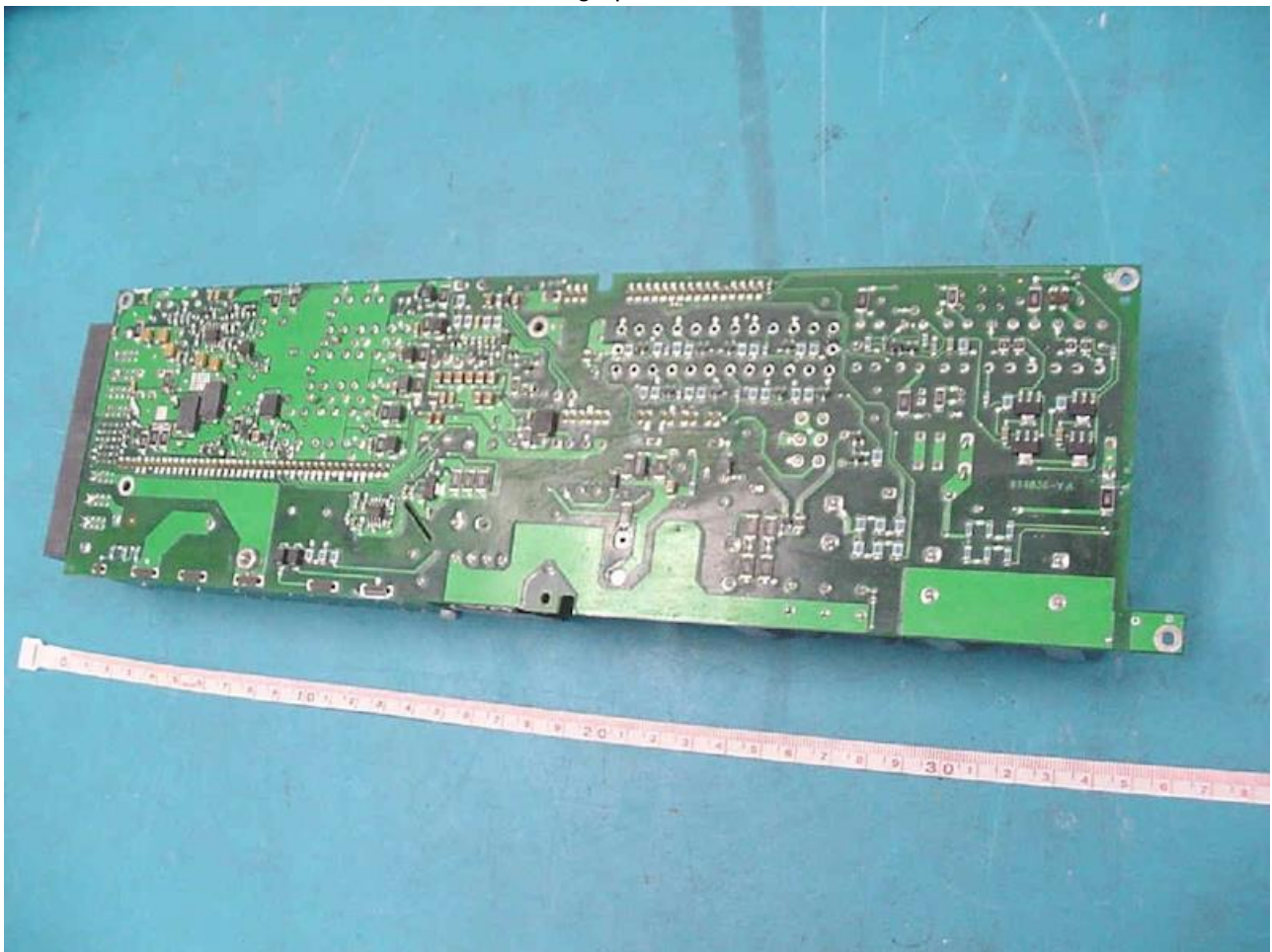
Enclosures

Photographs ID 03-04



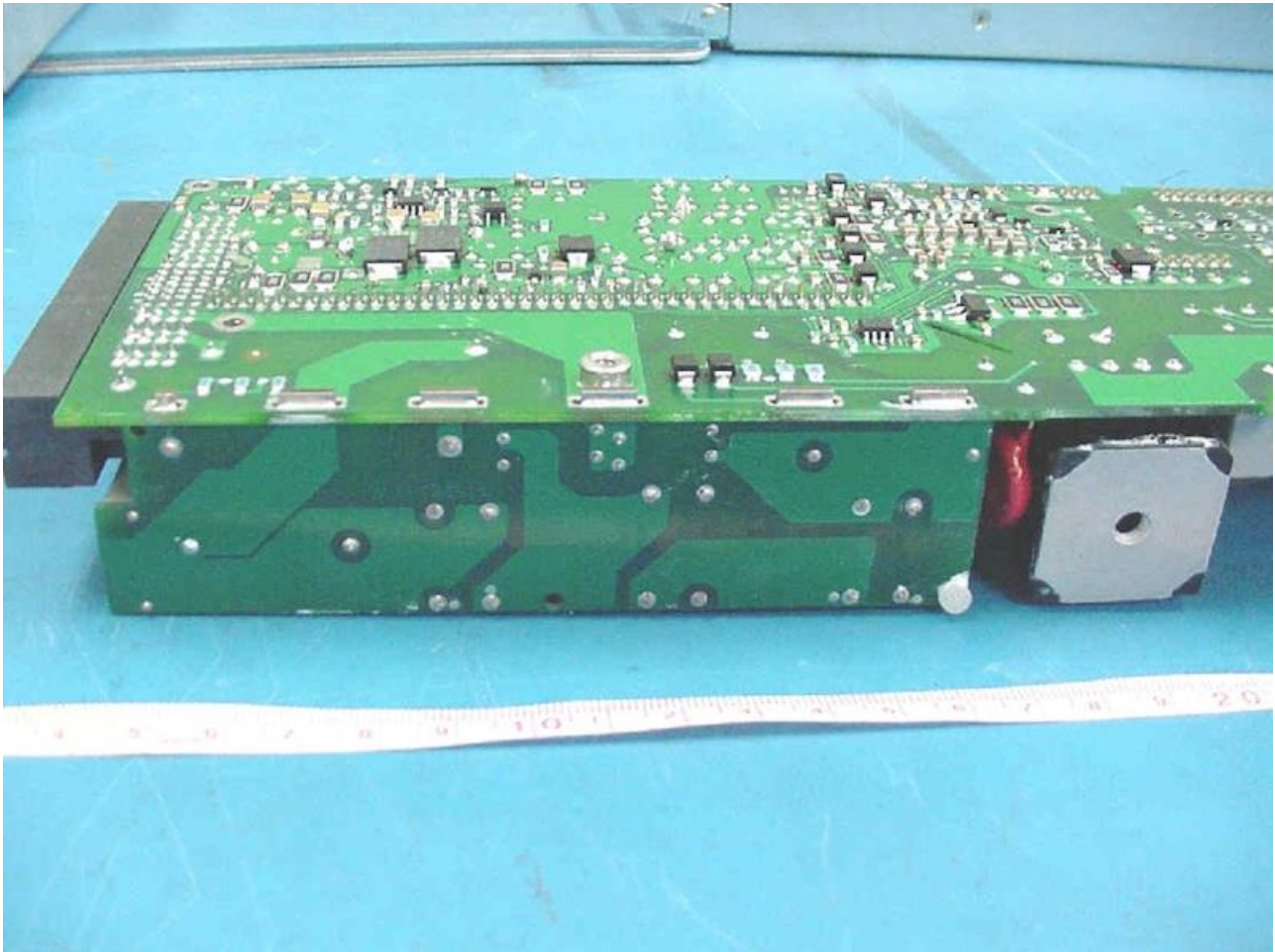
Enclosures

Photographs ID 03-05



Enclosures

Photographs ID 03-06



Enclosures

Diagrams ID 04-01

WINDING #	s	1	f	s	2	f	s	3	f	s	4	f	s	5	f	s	6	f	s	7	f
WIRE TYPE, SIZE	14 (BIF)																				
REF. DES.	14 (BIF)																				
TOTAL TURNS	14 (BIF)																				
TAPPED	-																				
BREAKOUT (LEADOUT)	1 - 2																				
BREAKOUT TYPE AND LENGTH	FLYING LEADS																				
TERMINAL #	1 - 2																				
SEE NOTES	(1)																				

INSTRUCTIONS:

- WIND ITEMS (2) AND (3) BIFILAR ON CORE ITEM (1).
- TIN LEADS TO THE BOTTOM OF CORE AS SHOWN. DO NOT TIN LEADS PAST BOTTOM OF CORE.
- TIN LEADS TO THE SIDE OF THE CORE AND SECURE LEAD OUT TO TOROID & HEADER ITEM (2) USING ITEM (2) AT BASES AS SHOWN. DO NOT STRIP INSULATION PAST BOTTOM OF ONE.
- APPLY LABEL ITEM (4) AS PER REF. MFG. PROCESS PRODUCT LABEL #980016
- SECURE THE LABEL USING TAPE ITEM (5) AROUND ENTIRE CIRCUMFERENCE AS SHOWN.

COIL & FINAL ASSEMBLY

CHEROKEE INTERNATIONAL, LLC.

DWG NO. 210385 REV. E

PAGE 2 OF 3 PAGES

APPLICATION	USED ON	CHG BY	REV	DESCRIPTION	DATE	APPROVED	APPROVED
CAP1000		A	1	PROD REL PER ED#17077	06/24/99	DLE	GB
		B	2	CH 12947	05/26/13	DLE	GB
		C	3	CH 12933	02/01/15	PI	MARK
		D	4	CH-0022514	12/03/15	PI	MARK
		E	5	CO31458	09/07/2017	JORD	FLUX

INDUCTOR	
COMMON MODE	
SHT#	DESCRIPTION
1	COVER SHEET & INDEX
2	COIL & FINAL ASSEMBLY
3	TEST SPEC & SCHEM

SEE SEPARATE PARTS LIST

CHEROKEE INTERNATIONAL, LLC.

MAG, INDUCT

DWG NO. 210385 REV. E

PAGE 3 OF 3 PAGES

TEST SPEC.			
PARAMETER	TERMINALS	METHOD- INST. AND SETTINGS ETC.	LIMITS(TOL)
INDUCTANCE	1 - 2 3 - 4	USE WAYNE KERR BRIDGE #4225 OR #4250. SET FREQUENCY TO 10kHz.	1.3mH - 2.5mH
LEAKAGE INDUCTANCE			
DC RESIST.	1 - 2 3 - 4	QUADTECH # 1880	10.0 MILLIONHMS MAX
		QUADTECH # 1880	10.0 MILLIONHMS MAX
RATIO AND PHASING			
HIPOT TO SPEC. #980013	FROM 1 FROM 2 FROM 3 FROM 4	10 10 10 10	1000VAC / 1 SEC

SCHEMATIC

CHEROKEE INTERNATIONAL, LLC.

DWG NO. 210385 REV. E

PAGE 3 OF 3 PAGES

<u>TEST SPEC.</u>			
PARAMETER	TERMINALS	METHOD-- INST. AND SETTINGS ETC.	LIMITS(TOL.)
INDUCTANCE	1 - 2 3 - 4	USE WAYNE KERR BRIDGE #4225 OR #4250. SET FREQUENCY TO 10kHz	1.3mht - 2.5mht
LEAKAGE INDUCTANCE			
DC RESIST	1 - 2 3 - 4	QUADTECH # 1880 QUADTECH # 1880	10.0 MEGOHMS MAX 10.0 MEGOHMS MAX
RATIO AND PHASING			
HIPOT FROM SPEC. #980013	FROM 1 FROM	TO 10 TO	3 1000VAC / 1 SEC

SCHEMATIC

```

      graph LR
        P1(( )) --- P2(( ))
        P1 --- S1(( ))
        P2 --- S2(( ))
        S1 --- O1((1))
        S2 --- O2((2))
        S1 --- O3((3))
        S2 --- O4((4))
    
```

The schematic shows a transformer core with four terminals. The top winding has terminals 1 and 2. The bottom winding has terminals 3 and 4. There are also internal connections between the top and bottom windings at the left and right ends of the core.

CHEROKEE INTERNATIONAL, LLC.

DWG A SIZE

DWG NO. **210385**
 PAGE 3 OF 3 PAGES

REV. E

Enclosures

Diagrams ID 04-04

WINDING #	1	2	3	4	5	6	7
WIRE TYPE, SIZE, REF. DES.	12						
TAPPED							
LEADOUT POSN.	2 - 5						
LEADOUT TYPE AND LENGTH	FLYING LEADS						
TURNING PER LAYER	12						
TOTAL LAYERS	1						
LAYER INSULATION							
WRAPPER							
TERMINAL #s	2 - 5						
INSTRUCTIONS	①						

④ SECURE THE LABEL USING TAPE ITEM ① AROUND ENTIRE CIRCUMFERENCE AS SHOWN.
③ APPLY LABEL ITEM ③ AS PER REF MFG PROC PRODUCT LABEL #980016.
② TIN LEADS TO THE BOTTOM OF CORE.
① LEAD LENGTH MEASURED FROM EDGE OF CORE.

INSTRUCTIONS: COIL ASSEMBLY

Cherokee International, LLC DWG NO. 260064 REV. 1
SIZE PAGE 2 OF 4 PAGES

TEST SPEC.		
PARAMETER	TERMINALS	METHOD- INST. AND SETTINGS ETC.
INDUCTANCE	2 - 5	USE WAYNE KERR BRIDGE #4225 OR #4250. SET FREQUENCY TO 10kHz.
LEAKAGE INDUCTANCE		
DC RESIST.	2 - 5	QUAD TECH 1880
RATIO AND PHASING		

FROM	TO
FROM	TO
FROM	TO
FROM	TO
FROM	TO

SCHEMATIC

Cherokee International, LLC DWG NO. 260064 REV. 1
SIZE PAGE 4 OF 4 PAGES

APPLICATION		REVISIONS	
NEXT ASSY	USED ON	CHG BY	CHG BY
	SP284		
		101	PROTOTYPE
		A	PROD REL PER ED #6704
		B	CHGD PER ECH 11368
		C	CHGD PER ECH 11840
		D	CHGD PER ECH 14443
		E	CHGD PER ECH 18570
		F	CHGD PER ECH 30108
		G	CHGD PER ECH 13374
		H	CHGD PER ECH 18280
		I	CH - 0023860

AGENCIES MATERIAL TRACEABILITY REQUIREMENT FOR INDUCTOR:

- FOR MATERIAL TRACEABILITY AND MATERIAL IDENTIFICATION PURPOSE, FOR ALL BOBBINS AND HEADERS UNDER EACH PURCHASING ORDER, THE MANUFACTURING LOCATION OF THIS PART SHALL ENFORCE THAT EACH RECEIVING LOT OF THE BOBBIN/HEADERS SHALL HAVE A "CERTIFICATE OF COMPLIANCE" FROM THE BOBBIN/HEADER MANUFACTURERS CERTIFYING "THE MATERIAL MANUFACTURER NAME AND THE MATERIAL DESIGNATION OF THE BOBBIN IN ACCORDANCE WITH THE CHEROKEE SPECIFICATION", AND SHALL MAINTAIN THIS "MATERIAL C OF C" FOR AT LEAST TWO YEARS, AND SHALL BE AVAILABLE FOR AGENCIES AUDITING PURPOSE.
- ALL MANUFACTURING LOCATION OF THIS MAGNETIC ASSEMBLY SHALL USE THE CORRECT MATERIALS CALLED OUT IN THE CHEROKEE INTERNATIONAL BILL OF MATERIAL AND THE CHEROKEE AVL. ALSO WHEN SHIP THE FINISH PARTS TO END USERS SUCH AS CHEROKEE USA AND CHEROKEE CHINA, ETC., "CERTIFICATE OF CONFORMITY" IS REQUIRED IN EACH LOT OF SHIPMENT STATING THAT "ALL MATERIAL USED IN THESE MAGNETIC ASSEMBLY PARTS ARE IN ACCORDANCE WITH, AND CONFORM TO, CHEROKEE SPECIFICATIONS". IT IS THE RESPONSIBILITY OF THE QA DEPT. OF CHEROKEE USA OR CHEROKEE CHINA, OR OTHER END USERS TO MAINTAIN THIS "CERTIFICATE OF CONFORMITY" FOR AT LEAST TWO YEARS, AND SHALL BE AVAILABLE FOR AGENCIES AUDITING PURPOSE.

NOTE: IF INDUCTORS ARE MADE IN CHEROKEE CHINA, AND TO BE USED IN POWER SUPPLY ASSEMBLED IN CHEROKEE CHINA THEN "CERTIFICATE OF CONFORMITY" MENTIONED IN ABOVE "2". IS NOT REQUIRED.

MATERIAL SPECIFICATION: WINDING WIRES RATED 155°C

INDUCTOR
RESONANT PFC
SH#
DESCRIPTION
1 COVER SHEET & INDEX
2 COIL ASSEMBLY
3 HEADER ASSEMBLY
4 TEST SPEC & SCHEM

Cherokee International, LLC
ASY, HDR, INDUCT
DWG NO. 260064 REV. 1
SIZE PAGE 1 OF 4 PAGES

3. SECURE THE INDUCTOR ON HEADER ITEM ⑤
② SECURE LEADS OUT TO TOROID USING ITEMS ⑥ AND ⑦ AS SHOWN.
① SOLDER LEADS TO PINS AS SHOWN. MAKE SURE THERE IS NO SOLDER BUILD-UP BELOW HDR FOOT.

INSTRUCTIONS: HEADER ASSEMBLY

Cherokee International, LLC DWG NO. 260064 REV. 1
SIZE PAGE 3 OF 4 PAGES

Enclosures

Diagrams ID 04-05

WINDING #	s	1	F	s	2	F	s	3	F	s	4	F	s	5	F	s	6	F	s	7	F
WIRE TYPE, SIZE, REF. DES.	17	2																			
TAPPED	—																				
LEADOUT POSN.	2 - 5																				
LEADOUT TYPE AND LENGTH	FLYING LEADS																				
TURNING PER LAYER	12																				
TOTAL LAYERS	1																				
LAYER INSULATION	—																				
WRAPPER	—																				
TERMINAL #s	2 - 5																				
INSTRUCTIONS	①																				

④ SECURE THE LABEL USING TAPE ITEM ① AROUND ENTIRE CIRCUMFERENCE AS SHOWN.
③ APPLY LABEL ITEM ③ AS PER REF MFG PROC PRODUCT LABEL #980016.
② TIN LEADS TO THE BOTTOM OF CORE.
① LEAD LENGTH MEASURED FROM EDGE OF CORE.

INSTRUCTIONS:

COIL ASSEMBLY

Cherokee International, LLC

DWG NO. 261026

REV. B

PAGE 2 OF 4 PAGES

TEST SPEC.			
PARAMETER	TERMINALS	METHOD— INST. AND SETTINGS ETC.	LIMITS(TOL)
INDUCTANCE	2 - 5	USE WAYNE KERR BRIDGE #4225 OR #4250. SET FREQUENCY TO 10kHz.	4.0iH - 6.0iH
LEAKAGE INDUCTANCE			
DC RESIST.			
RATIO AND PHASING			
HIPOT TO SPEC. 980013	FROM TO		
	FROM TO		
	FROM TO		
	FROM TO		

SCHEMATIC

24T

Cherokee International, LLC

DWG NO. 261026

REV. B

PAGE 4 OF 4 PAGES

APPLICATION		REVISIONS						
REV	USED ON	CHG BY	CHG BY	REV	DESCRIPTION	DATE	APPROVED	APPROVED
1	SP646	XDI			PROTOTYPE ECH 26057	04/17/06	D VU	GEORGE
2		VK	GB	A	PROD REL ECH 26786	06/06/06	D VU	GEORGE
3		VK	JP	B	CHGD PER ECH 28812	06/18/06	D VU	GEORGE

AGENCIES MATERIAL TRACEABILITY REQUIREMENT FOR INDUCTOR:

- FOR MATERIAL TRACEABILITY AND MATERIAL IDENTIFICATION PURPOSE, FOR ALL BOBBINS AND HEADERS UNDER EACH PURCHASING ORDER, THE MANUFACTURING LOCATION OF THIS PART MUST ENFORCE THAT EACH RECEIVING LOT OF THE BOBBIN/HEADERS MUST HAVE A "CERTIFICATE OF COMPLIANCE" FROM THE BOBBIN/HEADER MANUFACTURERS CERTIFYING THE MATERIAL MANUFACTURER NAME AND THE MATERIAL DESIGNATION OF THE BOBBIN IN ACCORDANCE WITH THE CHEROKEE SPECIFICATION, AND MUST MAINTAIN THIS "MATERIAL C OF C" FOR AT LEAST TWO YEARS, AND MUST BE AVAILABLE FOR AGENCIES AUDITING PURPOSE.
- ALL MANUFACTURING LOCATION OF THIS MAGNETIC ASSEMBLY MUST USE THE CORRECT MATERIALS CALLED OUT IN THE CHEROKEE INTERNATIONAL BILL OF MATERIAL AND THE CHEROKEE AVL ALSO WHEN SHIP THE FINISH PARTS TO END USERS SUCH AS CHEROKEE USA AND CHEROKEE MEXICO, ETC, "CERTIFICATE OF CONFORMITY" IS REQUIRE IN EACH LOT OF SHIPPING STATING THAT "ALL MATERIAL USED IN THESE MAGNETIC ASSEMBLY PARTS ARE IN ACCORDANCE WITH, AND CONFORM TO, CHEROKEE SPECIFICATIONS. IT IS THE RESPONSIBILITY OF THE QA DEPT. OF CHEROKEE USA OR CHEROKEE ELECTRONICA IN MEXICO OR OTHER END USERS TO MAINTAIN THIS "CERTIFICATE OF CONFORMITY" FOR AT LEAST TWO YEARS, AND MUST BE AVAILABLE FOR AGENCIES AUDITING PURPOSE.

INDUCTOR

RESONANT PFC

SHT# DESCRIPTION

1 COVER SHEET & INDEX

2 COIL ASSEMBLY

3 HEADER ASSEMBLY

4 TEST SPEC & SCHEM

CHEROKEE INTERNATIONAL, LLC.

ASY, HDR, INDUCT

261026

REV. B

PAGE 3 OF 4 PAGES

② ATTENTION: LEAD PROTRUSION BELOW HEADER MUST BE FREE OF ADHESIVE.

① SECURE LEAD OUT TO TOROID & HEADER ITEM ⑤ USING ITEMS ⑥ & ⑦ AT BASE OF INDUCTOR AS SHOWN.

INSTRUCTIONS:

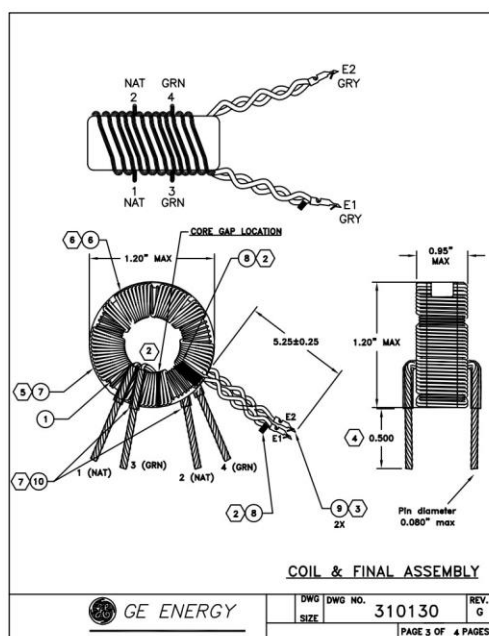
HEADER ASSEMBLY

Cherokee International, LLC

DWG NO. 261026

REV. B

PAGE 3 OF 4 PAGES



Enclosures

Diagrams ID 04-09

WINDING #	1	2	3	4	5	6
WIRE TYPE, SIZE, REF. DES.	HNZY #20 RED (5)	TPL INS #28 BLUE (14)	HNZY #28 GRN (6)	TPL INS #28 RED (7)	TPL INS #28 ORG (13)	HNZY #20 RED (5)
TOTAL TURNS	40	11	11	7	11	20
TAPPED						
BREAKOUT (LEADOUT)	5 - A	3 - 4	7 - 8	2 - 1		A - 6
BREAKOUT TYPE AND LENGTH	SELF LEAD TO PIN	SELF LEAD TO PIN	SELF LEAD TO PIN	FLYING LEAD TO PIN 4 SIDE	SELF LEAD TO PIN	
URNS PER LAYER	30 x 10 = 40	11	11	7	11	20
TOTAL LAYERS	2	1	1	1	1	1
LAYER INSULATION						
WRAPPER	2 LAYERS (5)	1 LAYER (5)	1 LAYER (5)	1 LAYER (5)	2 LAYERS (5)	
TERMINAL #	5 - A	3 - 4	7 - 8	2 - 1	E1 - E2	A - 6
INSTRUCTIONS	(1)(4)(5)(6)	(5)	(5)	(5)	(2)(5)	(5)

1 - 6 7 - 12

1 PLACE BOBBIN ON MANDREL, PIN #1 TOWARD HEADSTOCK.
2 MARK START OF FLYING LEAD, E1, WITH A PIECE OF TAPE ITEM #5.
3 CUT THE BOBBIN PIN #1 TO 4 SIDE.
4 START W1 ON A, RESERVE WIRE FOR W6 ON MANDREL AND FINISH ON PIN #5.
5 ALL WINDING WRAPPER ON START AND FINISH TOP THE BOBBIN.
6 WOUND 10 TURNS SPIRAL PER WINDING SCHEMATIC.

INSTRUCTIONS:

CHEROKEE INTERNATIONAL, LLC DWG NO. 321274 REV. B
PAGE 2 OF 4 PAGES

TEST SPEC.		
PARAMETER TERMINALS METHOD- INST. AND SETTINGS ETC. LIMITS(TOL)		
INDUCTANCE	5 - 6	USE WAYNE KERR BRIDGE #4225 OR #4250. 160 uH - 250 uH
LEAKAGE INDUCTANCE	5 - 6	short pin 1,2,3,4,7,8,E1&E2 10 uH MAX
DC RESIST.	1 - 2	QUADTECH # 1880 72 MILLIOHMS MAX
	3 - 4	92 MILLIOHMS MAX
	5 - 6	750 MILLIOHMS MAX
	7 - 8	98 MILLIOHMS MAX
	E1 - E2	135 MILLIOHMS MAX
RATIO AND PHASING	5 - 6	APPLY 6.0V @ 20KHz. DMM (100KHz). 6.0V (REF)
	7 - 8	1.05VAC - 1.15VAC
	E1 - E2	1.05VAC - 1.15VAC
	3 - 4	1.05VAC - 1.15VAC
	2 - 1	.85VAC - .75VAC
	5 - E2	JOIN 6 TO 7, 8 TO 3, 4 TO 2, AND 1 TO E1 9.8VAC - 10.2VAC
HIPOT TO SPEC. #980013	FROM 6 + 7 + CORE TO E1 + 3 + 2	3600VAC / 1 SEC.
	FROM 10	
	FROM 10	
	FROM 10	

SCHEMATIC

PRIMARY SECONDARY

W1 40T W2 11T
A A
W6 20T W5 11T
6 7 W3 11T W4 7T
8 1

CHEROKEE INTERNATIONAL, LLC DWG NO. 321274 REV. B
PAGE 4 OF 4 PAGES

APPLICATION		REVISIONS	
NEXT ASSY	USED ON	CHG BY	REV
	CAR2548	X01	PROTOTYPE ECH #25587 12/08/05 JM GEORGE
		SP	GB A PROD REL ECH 27173 01/25/07 RACF GEORGE
		WINDY	MARK B CH 19934 02/01/15 PI MARK

AGENCIES REQUIREMENTS:

1. THIS CLASS F TRANSFORMER MUST BE MARKED WITH UL RECOGNIZED NAME "CHEROKEE INTERNATIONAL", AND ALSO MUST BE MARKED WITH UL SYSTEM DESIGNATION "RX12".

2. ALSO, THE TRANSFORMER MUST BE MARKED WITH PROPER ID CODE OF THE PROPER MANUFACTURING LOCATION MENTIONED IN SECTION GENERAL OF UL FILE E137214.

TRANSFORMER	
SHT #	DESCRIPTION
1	COVER SHEET & INDEX
2	WINDING
3	FINAL ASSEMBLY
4	TEST SPEC & SCHEM

SEE SEPARATE PARTS LIST

CHEROKEE INTERNATIONAL, LLC
MAG, XFMR
OUTPUT BIAS
321274 REV. B
PAGE 1 OF 4

INSTRUCTIONS:

1 FIT TWO CORES ITEM 2 WITH GAP MATERIAL ITEM 4, WHICH ARE APPLIED TO EACH LIMB OF CORE. DO NOT USE GLUE.

2 SECURE CORE USING TAPE ITEM 18 THREE TURNS.

3 EPOXY SIDES OF CORE AS SHOWN AND CURE USING ITEM 10 AND 11 TO SPEC. #9840048.

4 APPLY LABEL ITEM 13 AS PER REF MFG PROC PRODUCT LABEL #980016.

5 VARNISH ASSEMBLY USING ITEM 9 TO SPEC. #9840048, KEEPING PINS CLEAN.

6 IMPORTANT: WHEN USING SOLDER BATH TO STRIP AND FASTEN WIRE TO PINS, ENSURE SOLDER TEMPERATURE IS LESS THAN 710°F.

7 STRIP START AND FINISH FLYING LEAD TO 0.25\" FROM THE END AND APPLY AMP TERMINAL ITEM 19 TWIST START AND FINISH FLYING LEAD, 2 TURNS PER INCH.

FINAL ASSEMBLY

CHEROKEE INTERNATIONAL, LLC DWG NO. 321274 REV. B
PAGE 3 OF 4 PAGES

Enclosures

Diagrams ID 04-10

SPECIFICATION FOR APPROVAL

Customer. _____

Description. _____ DC FAN

Part No. _____ REV. _____

Delta Model No. _____ TFB0412EHN -R00 REV. _____ 03

Sample Issue No. _____

Sample Issue Date. _____ NOV.08 2016

PLEASE SEND ONE COPY OF THIS SPECIFICATION BACK
AFTER YOU SIGNED APPROVAL FOR PRODUCTION PRE-
ARRANGMENT.

APPROVED BY:

DATE :

DELTA ELECTRONICS, INC.

TAOYUAN PLANT

252, SHANG YING ROAD, KUEI SAN INDUSTRIAL ZONE TAOYUAN

SHIEN, TAIWAN, R.O.C.

TEL:886-(0)3-3591968

FAX:886-(0)3-3591991

Enclosures

Diagrams ID 04-10

DELTA ELECTRONICS, INC.

252, SHANG YING ROAD, KUEI SAN

TAOYUAN HSIEN 333, TAIWAN, R. O. C.

TEL : 886-(0)3-3591968

FAX : 886-(0)3-3591991

SPECIFICATION FOR APPROVAL

Customer:

Description: DC FAN

Customer P/N:

REV:

Delta Model NO.: TFB0412EHN-R00 Delta safety model NO.: TFB0412EHN

Sample Rev: 03

Issue NO:

Sample Issue Date:

Quantity:

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN. THE FAN MOTOR IS WITH TWO PHASES AND EIGHT POLES.

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	7.0 - 13.2 VDC
INPUT CURRENT	0.72 (MAX. 0.87) A SAFETY CURRENT ON LABEL : 0.87A
INPUT POWER	8.64(MAX. 10.44) W
SPEED	15000 R.P.M. (REF.)
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.736(MIN. 0.661) M ³ /MIN. 26.03 (MIN. 23.40) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	34.64(MIN. 31.17) mmH ₂ O 1.36 (MIN. 1.224) inchH ₂ O
ACOUSTICAL NOISE (AVG.)	58.0 (MAX. 62.0) dB-A
INSULATION TYPE	UL: CLASS A

(continued)

Enclosures

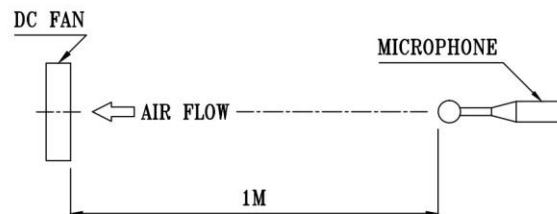
Diagrams ID 04-10

PART NO:

DELTA MODEL: TFB0412EHN-R00

INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 50/60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL)
EXTERNAL COVER	OPEN TYPE
LIFE EXPECTANCE	50,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM NAME PLATE SIDE
OVER CURRENT SHUT DOWN	THE CURRENT WILL SHUT DOWN WHEN LOCKING ROTOR.
LEAD WIRE	UL 1061 -F- AWG #24 BLACK WIRE NEGATIVE(-) RED WIRE POSITIVE(+) BLUE WIRE FREQUENCY(-R00)

- NOTES: 1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.
2. STANDARD AIR PROPERTY IS AIR AT (Td) 25°C TEMPERATURE, (RH) 65% RELATIVE HUMIDITY, AND (Pb) 760 mmHg BAROMETRIC PRESSURE.
3. THE VALUES WRITTEN IN PARENS , (), ARE LIMITED SPEC.
4. THE CHARACTERS SHOWED IN PAGE 1 IS THE CONDITION OF BOTH FANS RUN.
5. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN ANECHOIC CHAMBER WITH B & K SOUND LEVEL METER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

Enclosures

Diagrams ID 04-10

PART NO:
-----DELTA MODEL: TFB0412EHN-R00

3. MECHANICAL:

- 3-1. DIMENSIONS ----- SEE DIMENSIONS DRAWING
3-2. FRAME ----- PLASTIC UL: 94V-0
3-3. IMPELLER ----- PLASTIC UL: 94V-0
3-4. BEARING SYSTEM ----- TWO BALL BEARINGS
3-5. WEIGHT ----- 40 GRAMS

4. ENVIRONMENTAL:

- 4-1. OPERATING TEMPERATURE ----- -10 TO +60 DEGREE C
4-2. STORAGE TEMPERATURE ----- -40 TO +75 DEGREE C
4-3. OPERATING HUMIDITY ----- 5 TO 90 % RH
4-4. STORAGE HUMIDITY ----- 5 TO 95 % RH

5. PROTECTION:

5-1. LOCKED ROTOR PROTECTION

IMPEDANCE OF MOTOR WINDING PROTECTS MOTOR FROM FIRE IN 96
HOURS OF LOCKED ROTOR CONDITION AT THE RATED VOLTAGE.

5-2. POLARITY PROTECTION

BE CAPABLE OF WITHSTANDING IF REVERSE CONNECTION FOR POSITIVE
AND NEGATIVE LEADS.

6. RE OZONE DEPLETING SUBSTANCES:

- 6-1. NO CONTAINING PBBs, PBBOs, CFCs, PBBEs, PBDPEs AND HCFCs.

7. PRODUCTION LOCATION

- 7-1. PRODUCTS WILL BE PRODUCED IN CHINA OR THAILAND

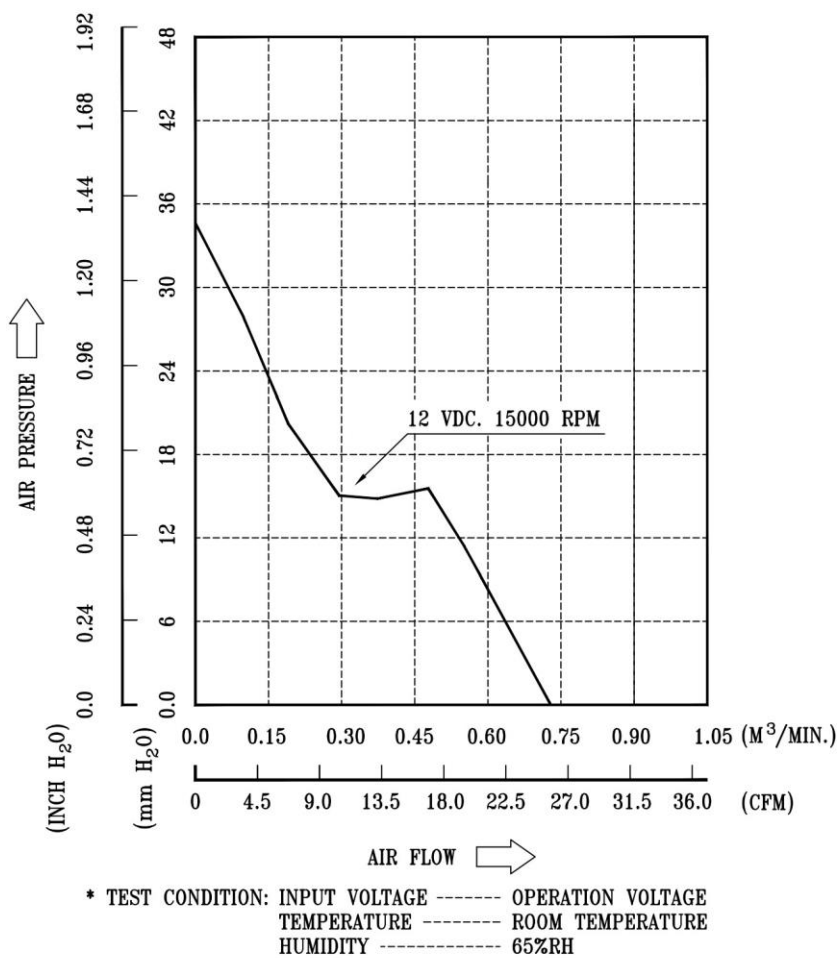
Enclosures

Diagrams ID 04-10

PART NO:

DELTA MODEL: TFB0412EHN-R00

8.P & Q CURVE:



Enclosures

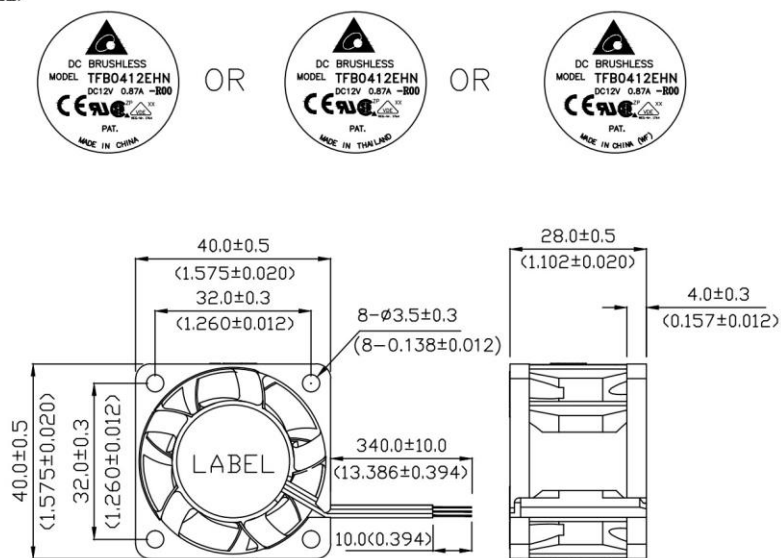
Diagrams ID 04-10

PART NO:

DELTA MODEL: TFB0412EHN-R00

9. DIMENSION DRAWING:

LABEL:



UL 1061 -F- AWG #24
BLACK WIRE NEGATIVE(-)
RED WIRE POSITIVE(+)
BLUE WIRE FREQUENCY(-R00)

DIMENSION UNIT: MM(INCH)

Enclosures

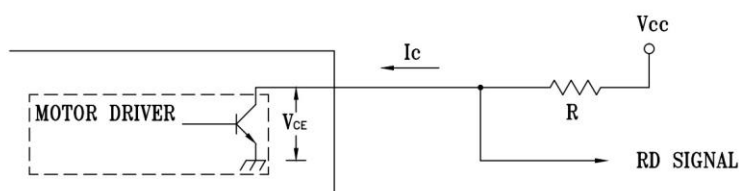
Diagrams ID 04-10

PART NO:

DELTA MODEL: TFB0412EHN-R00

FREQUENCY GENERATOR (FG) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



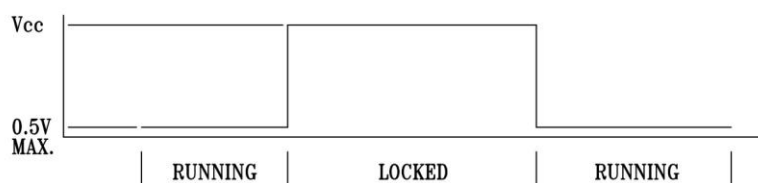
CAUTION:

THE LEAD WIRE OF RD SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE.

2. SPECIFICATION:

 $V_{cc} = 13.2V \text{ MAX}$ $V_{ce} = 0.5V \text{ MAX}$
 $I_c = 2mA \text{ MAX.}$ $I_c = V_{cc} / R$

3. ROTATION DETECT WAVEFORM:



Enclosures

Diagrams ID 04-10

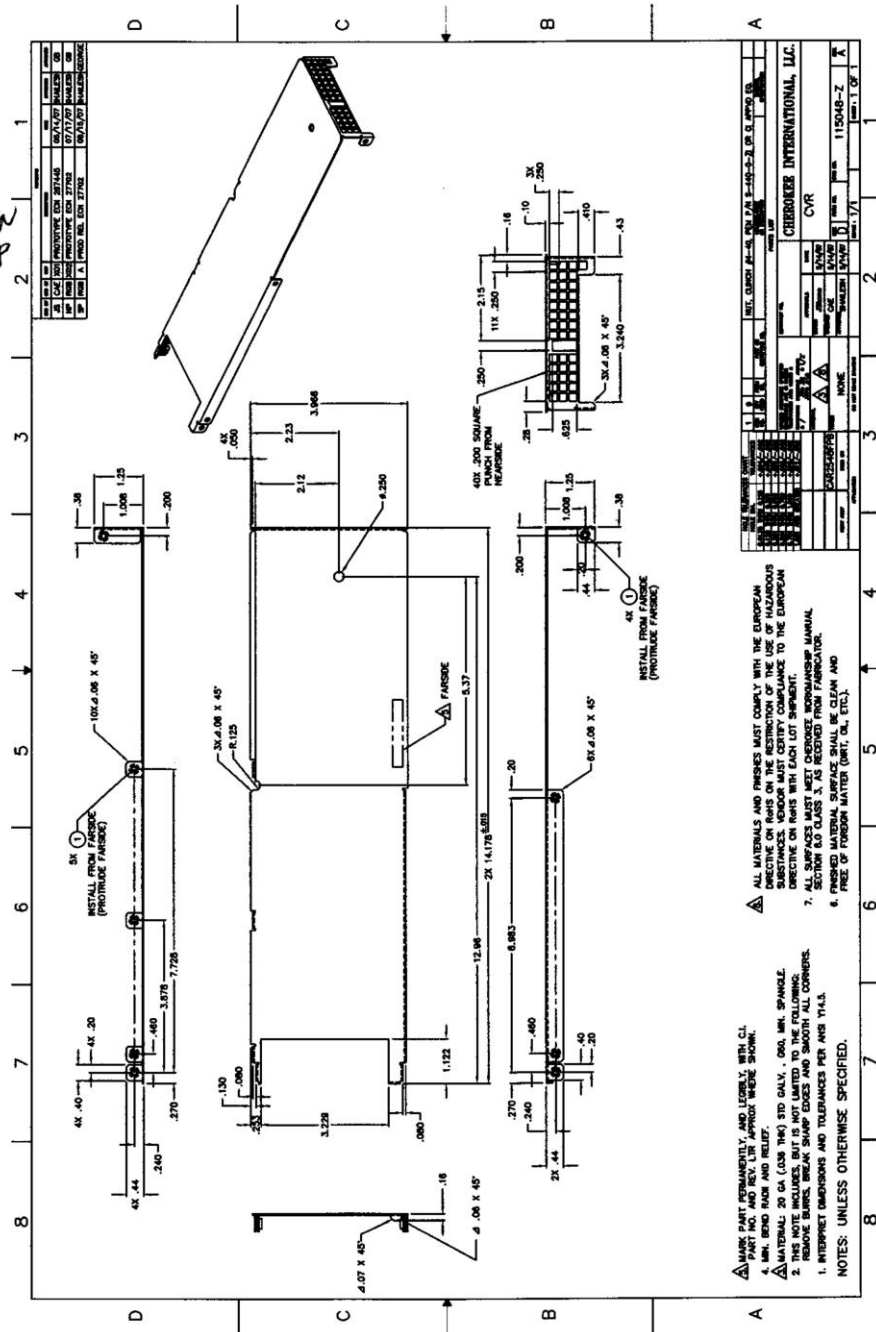
***Application Notice***

1. Delta will not guarantee the performance of the products if the application condition falls outside the parameters set forth in the specification.
2. A written request should be submitted to Delta prior to approval if deviation from this specification is required.
3. Please exercise caution when handling fans. Damage may be caused when pressure is applied to the impeller, if the fans are handled by the lead wires, or if the fan was hard-dropped to the production floor.
4. Except as pertains to some special designs, there is no guarantee that the products will be free from any such safety problems or failures as caused by the introduction of powder, droplets of water or encroachment of insect into the hub.
5. The above-mentioned conditions are representative of some unique examples and viewed as the first point of reference prior to all other information.
6. It is very important to establish the correct polarity before connecting the fan to the power source. Positive (+) and Negative (-). Damage may be caused to the fans if connection is with reverse polarity, if there is no foolproof method to protect against such error specifically mentioned in this spec.
7. Delta fans without special protection are not suitable where any corrosive fluids are introduced to their environment.
8. Please ensure all fans are stored according to the storage temperature limits specified. Do not store fans in a high humidity environment. We highly recommend performance testing is conducted before shipping, if the fans have been stored over 6 months.
9. Not all fans are provided with the Lock Rotor Protection feature. If you impair the rotation of the impeller for the fans that do not have this function, the performance of those fans will lead to failure.
10. Please be cautious when mounting the fan. Incorrect mounting of fans may cause excess resonance, vibration and subsequent noise.
11. It is important to consider safety when testing the fans. A suitable fan guard should be fitted to the fan to guard against any potential for personal injury.
12. Except where specifically stated, all tests are carried out at room (ambient) temperature and relative humidity conditions of 25°C, 65% RH. The test value is only for fan performance itself.
13. Be certain to connect an "4.7μF or greater" capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.

Enclosures

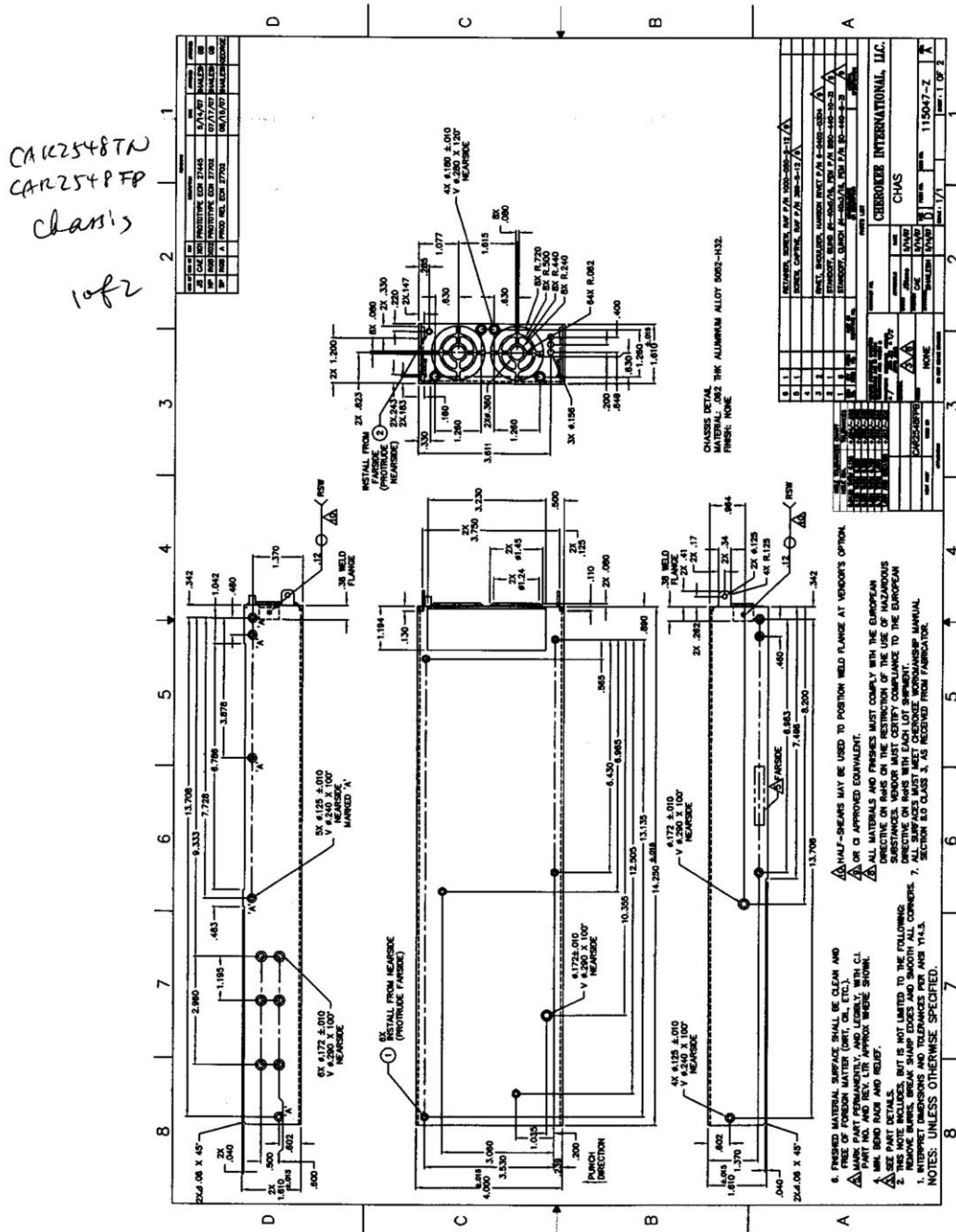
Diagrams ID 04-11

CAR2548TN
CAR2548FP
Cover
1 of 1



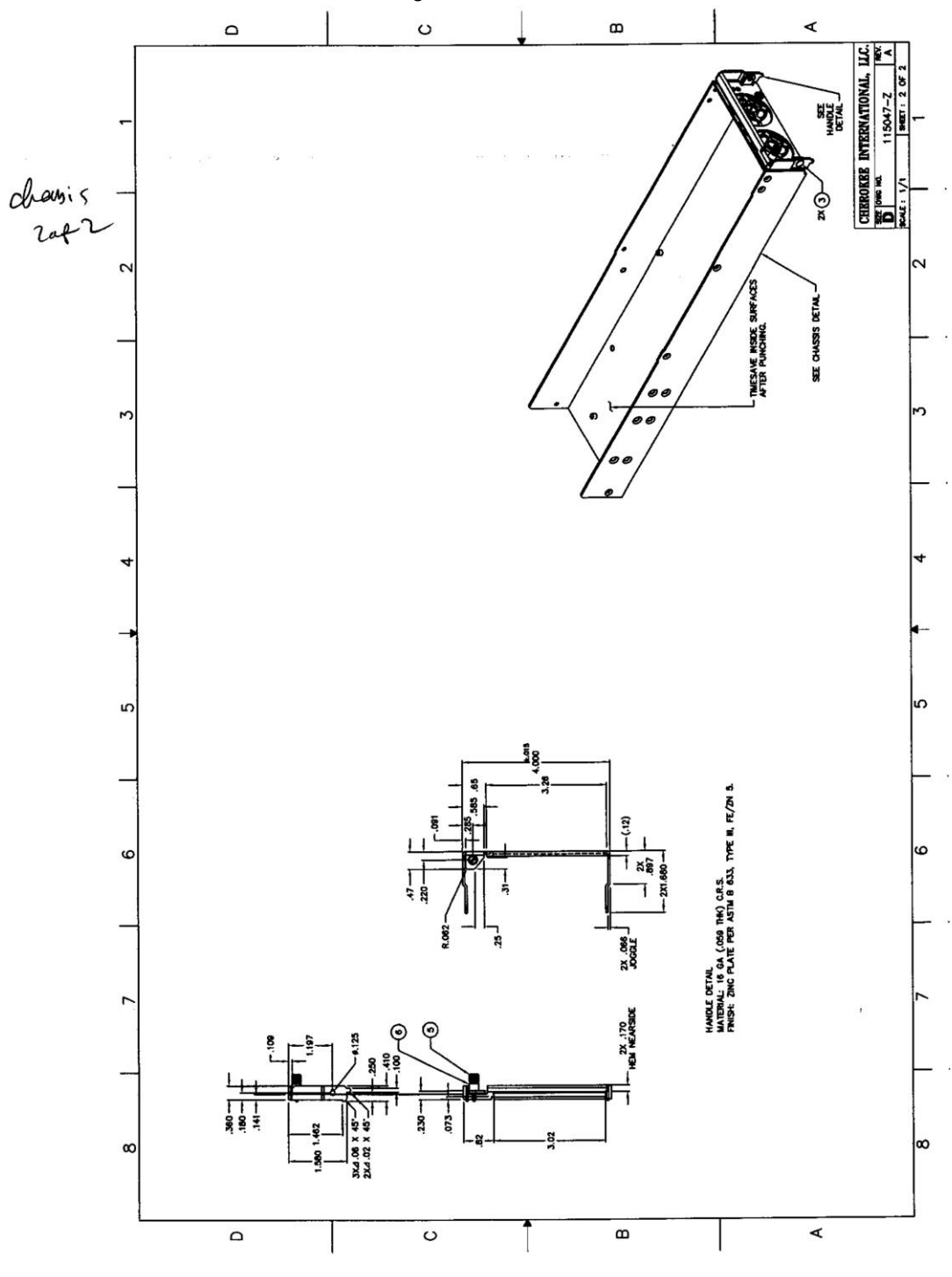
Enclosures

Diagrams ID 04-11



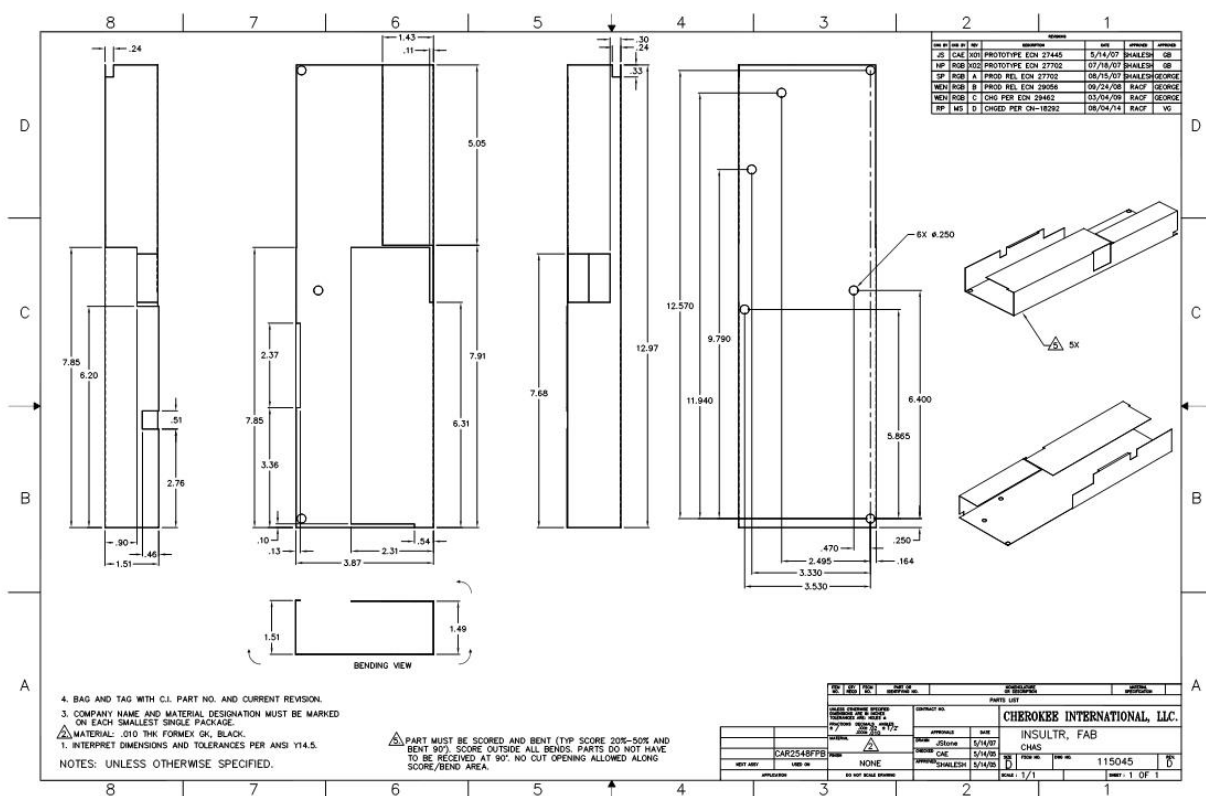
Enclosures

Diagrams ID 04-11



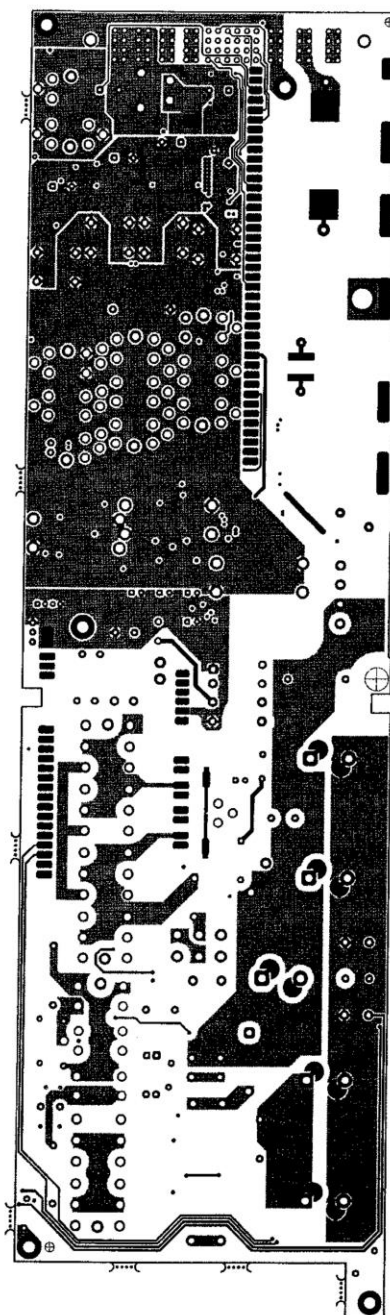
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Diagrams ID 04-12



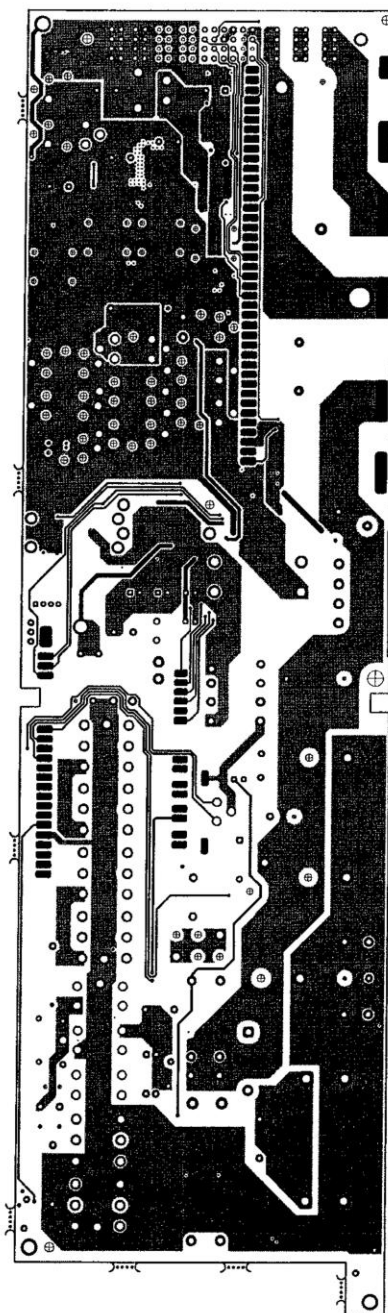
Enclosures

Schematics + PWB ID 05-01

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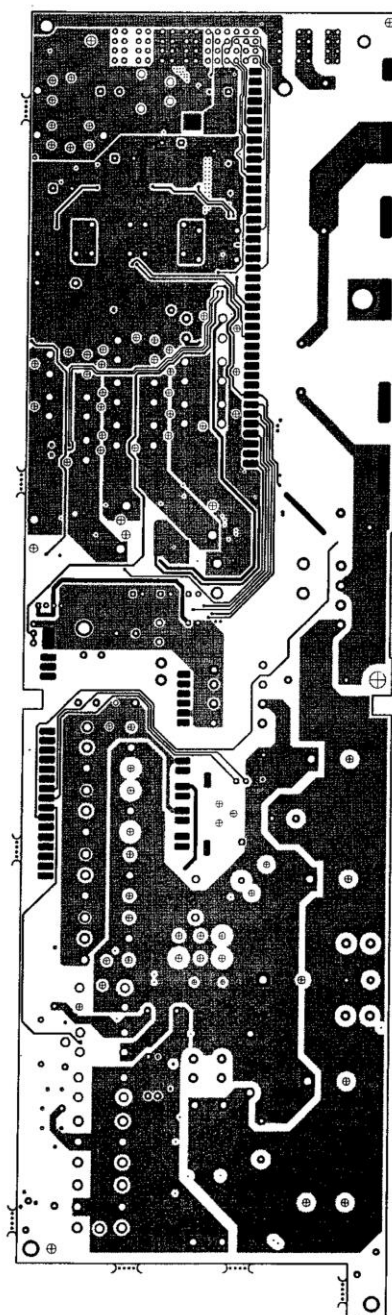
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Schematics + PWB ID 05-01

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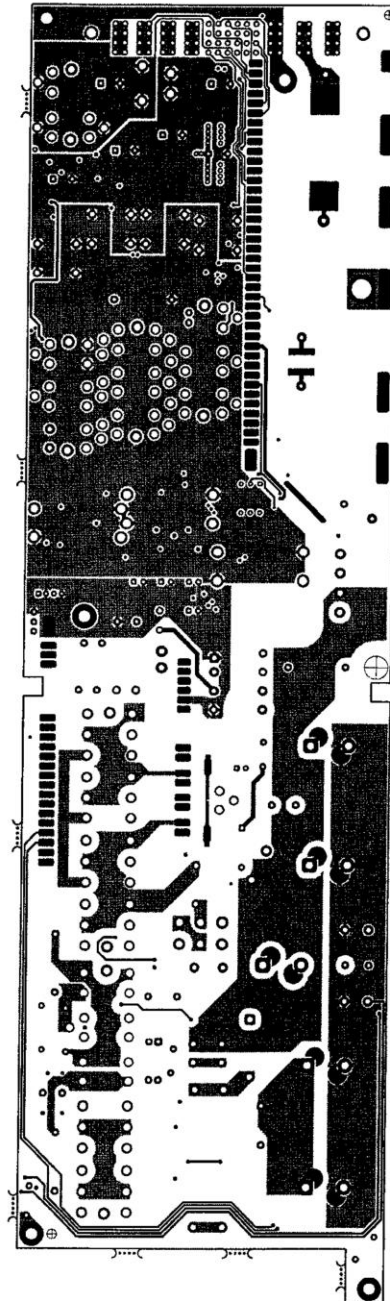
Enclosures

Schematics + PWB ID 05-01

[illegible]

Enclosures

Schematics + PWB ID 05-01

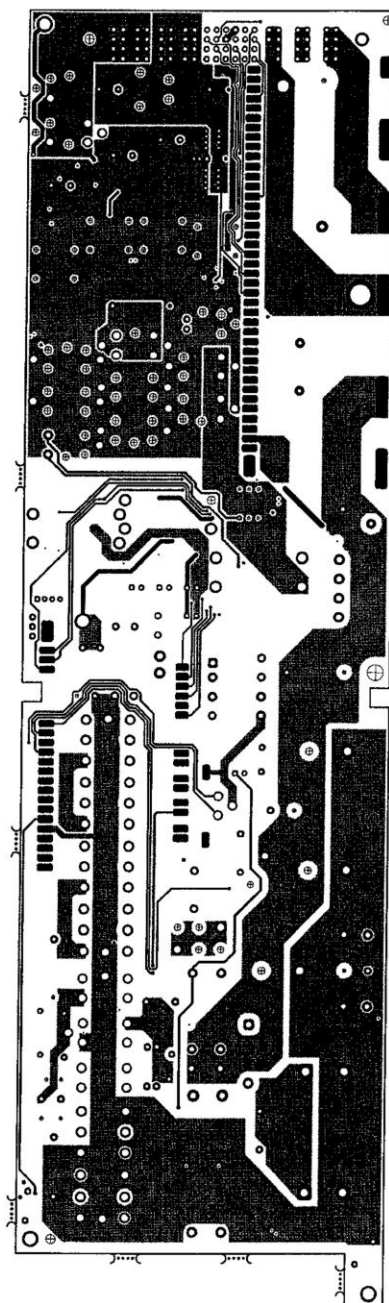


LAYER: TOP		115363-7A.pcb	
DESIGNED BY		charokee	
CHECKED BY		N. J. JONES	
APPROVED BY		PGB PWR	
DATE		115363-Y	
REV		A	

REV	DATE	DESIGNED	DATE	CHECKED	DATE	APPROVED	DATE

Enclosures

Schematics + PWB ID 05-01

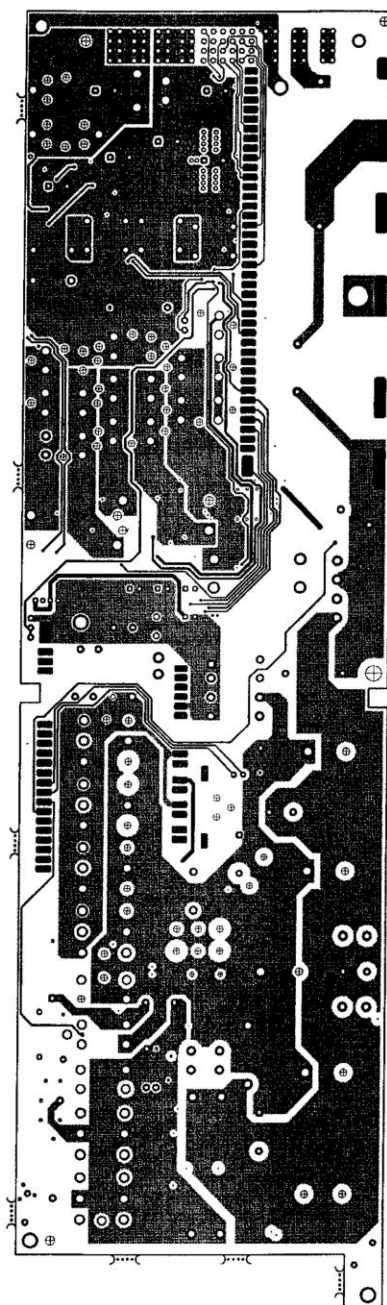


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NAME	DATE	 cherokee INTERNATIONAL PCB PUR JAN PUR	
JAVANT	18/19/97	TITLE	
RGB	18/19/97		
THOMAS	18/19/97		
PREPARED BY	18/19/97		
APPROVED BY	18/19/97		
DRAWING FILE NUMBER: 04025-44748		DATE: 15.5.2007	BY: V

[illegible]

Enclosures

Schematics + PWB ID 05-01



NAME	DATE	INIT	BOARD
JOHN JAVANT	18/19/97		
DAVID ROSE	18/19/97		
THOMAS THOMAS	18/19/97		
DAVID RALPH	18/19/97		
GEORGE GEORGE	18/19/97		



cherokee
INTERNATIONAL

PCB PWR
MAIN PWR

SITE

115363-Y

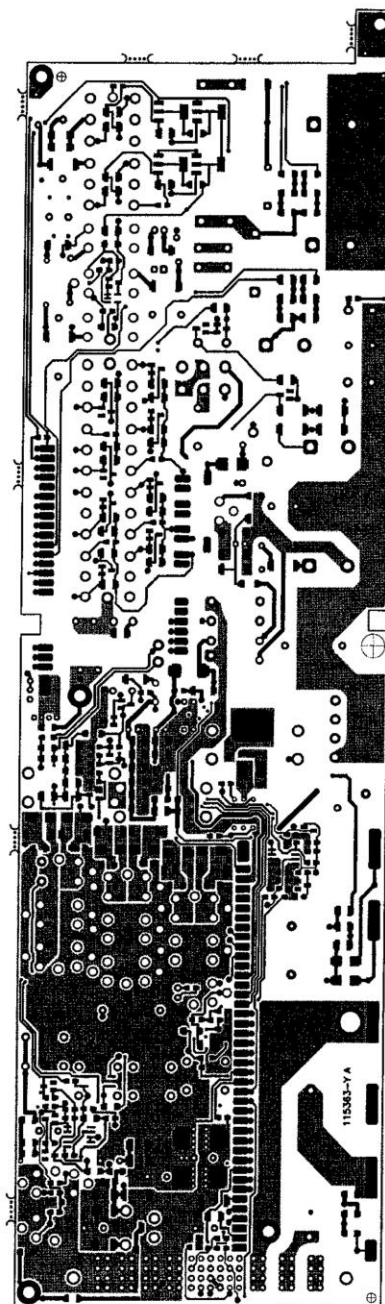
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4

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Enclosures

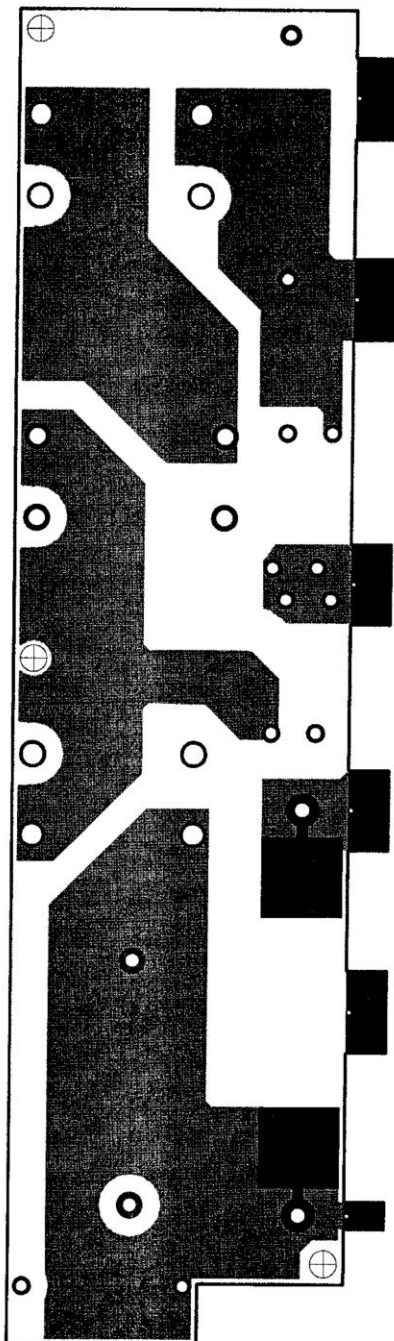
Schematics + PWB ID 05-01

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Enclosures

Schematics + PWB ID 05-01

REV	DRAWN	DATE	CHECKED	DATE	SAFETY	DATE	APPROVED	DATE	APPROVED	DATE
REVISIONS										



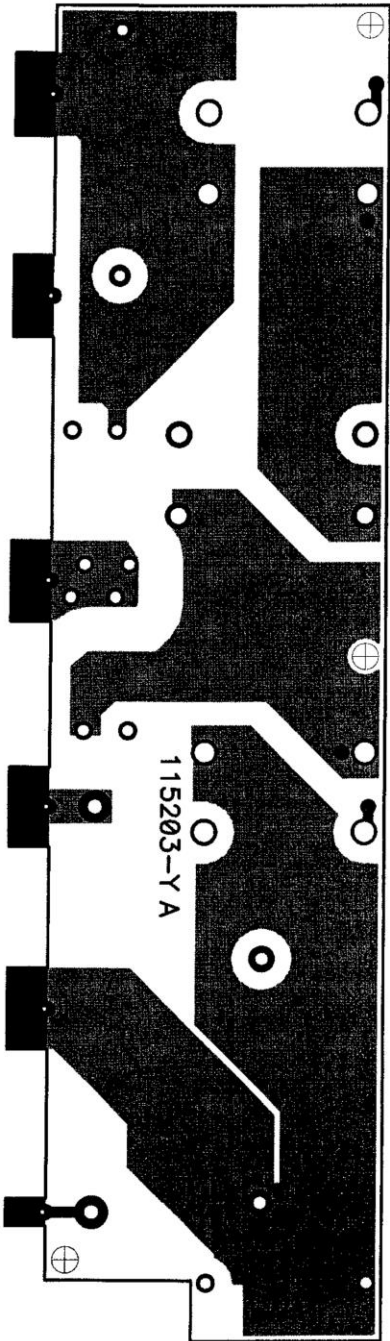
115203-YA.pcb

LAYER: TOP		BOARD	
DRAWN	JAYANT	 cherokee INTERNATIONAL	
CHECKED	RGB		
SAFETY	TT		
APPROVED	SHAILESH		
APPROVED			
		TITLE	
		PCB PWR EMI	
		SIZE	GERBER FILE NUMBER
			115203-Y
NEXT ASSY		REV	
		A	

Schematics + PWB ID 05-01

BOARD		BOT		:REV A	
cherokee		T0\01\80		T0\01\80	
INTERMEDIATE		T0\01\80		T0\01\80	
EMI		T0\01\80		T0\01\80	
PCB PWB		H211A12H		H211A12H	
SIZE		USED ON		NEXT V22A	
Y-25203-1		C4522481PBC			
A					

115203-Y A

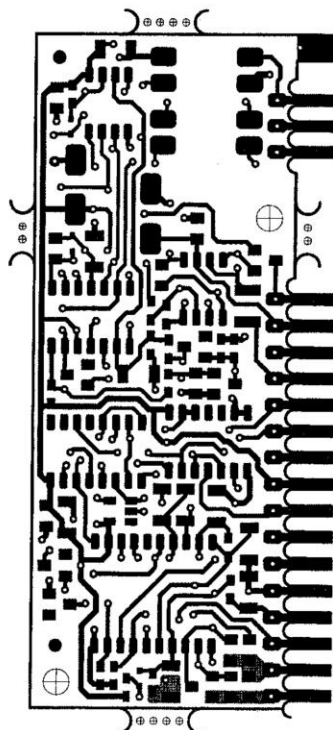


REV	DATE	CHECKED	DATE	Y22A	DATE	APPROVED	DATE

Enclosures

Schematics + PWB ID 05-01

REVISIONS									
REV	DRAWN	DATE	CHECKED	DATE	SAFETY	DATE	APPROVED	DATE	APPROVED
A	TV	01/07	RGB	01/07	TT	01/07	RACF	01/07	GB
X02	MB	06/06	RGB	06/06	TT	06/06	RACF	06/06	GB

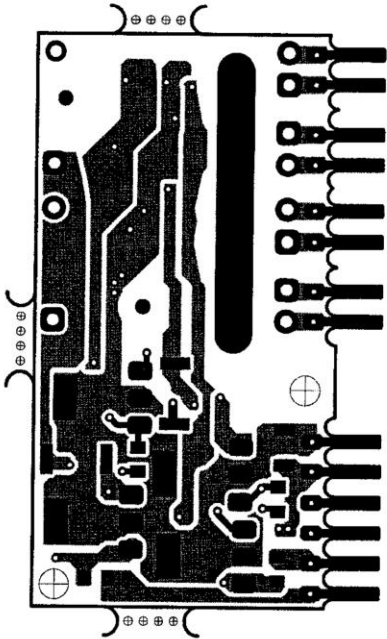


114319--YA.pcb

LAYER: TOP		BOARD	
DRAWN	MILIND	CHEROKEE INTERNATIONAL 2841 DOW AVE TUSTIN CA.92780 PHONE NO. (714)544-6665	
CHECKED	RGB		
SAFETY	THOMAS		
APPROVED	JM		
APPROVED	GEORGE		
		TITLE PCB CNTL PFC/BIAS(400)	
		SIZE	REV
		DWG NO. 114319-Y	
		CAR2548 USED ON	
NEXT ASSY			

Schematics + PWB ID 05-01

A	TV	01/07	RGB	01/07	TT	01/07	RACF	01/07	GB	01/07
REV	DRAWN	DATE	CHECKED	DATE	SAFETY	DATE	APPROVED	DATE	APPROVED	DATE
REVISIONS										



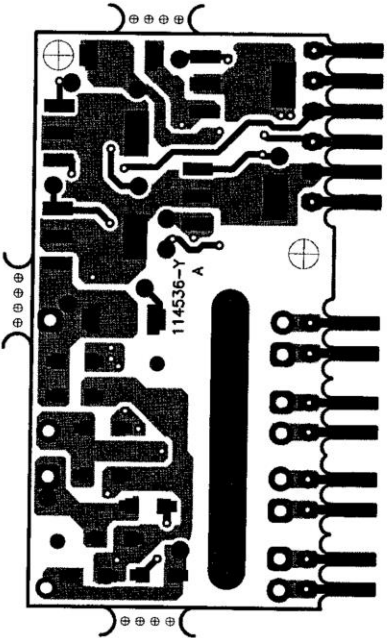
114536--YA.pcb

LAYER: TOP				BOARD			
DRAWN	MILIND	06/20/06					
CHECKED	RGB	06/20/06					
SAFETY	THOMAS	06/20/06					
APPROVED	JM	06/20/06					
APPROVED	GEORGE	06/20/06					
		CAR2512					
		USED ON					
NEXT ASSY							

Schematics + PWB ID 05-01

NEXT VISA		USED ON		114230-Y		A	
		CARSE215		SIZE		DMC NO.	
APPROVED		GEORGE		00\50\00		TITLE	
APPROVED		JIM		00\50\00		DRIVER	
2FELX		THOMAS		00\50\00		BCB CMT	
CHECKED		RGB		00\50\00		PHONE NO. (314)244-8882	
DRAWN		MILIND		00\50\00		5841 DOM VAE LUSLIN CV 85180	
LAYER:		TOP		CHEROKEE INTERNATIONAL			
						BOARD	

114230-YA.bcp



REVISIONS									
REV	DRAWN	DATE	CHECKED	DATE	2FELX	DATE	APPROVED	DATE	APPROVED
A	JA	01\01	RGB	01\01	LT	01\01	RVC	01\01	GB

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE)
CB SCHEME

CB TEST CERTIFICATE

Product

Switching Power Supply

Name and address of the applicant

ABB POWER ELECTRONICS(SHANGHAI) CO LTD
1F, BLDG 58, 461 HONGCAO RD
XUHUI DISTRICT
SHANGHAI
200233 CHINA

Name and address of the manufacturer

ABB POWER ELECTRONICS INC
601 SHILOH RD
PLANO TX 75074-7210
UNITED STATES

Name and address of the factory

Note: When more than one factory, please report on page 2

LINEAGE POWER CHINA CO LTD
NO 1353 CHEN QIAO RD SHANGHAI FENGPU INDUSTRIAL
PARK SHANGHAI 201401
CHINA☐ Additional Information on page 2

Ratings and principal characteristics

See Page 2

Trademark / Brand (if any)



Type of Customer's Testing Facility (CTF) Stage used

Model / Type Ref.

CAR2548FP, CAR2548TN
See Page 2

Additional information (if necessary may also be reported on page 2)

Additionally evaluated to EN 62368-1:2014/ A11:2017 ;National differences specified in the CB Test Report.

☐ Additional Information on page 2

A sample of the product was tested and found to be in conformity with

IEC 62368-1:2014

As shown in the Test Report Ref. No. which forms part of this Certificate

E252413-A6007-CB-1 issued on 2020-05-06

This CB Test Certificate is issued by the National Certification Body



UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA

UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK

UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN

UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2020-05-06

Signature:

Jan-Erik Storgaard



Ref. Certif. No.

DK-96731-UL

Model Details:

CAR2548FP, CAR2548TN (may be optionally followed by "B", and/or "C", and/or "A", and/or "5", and/or "-Z" or "-Z01A", and/or "-Y" or "-Y01A", see test report for model details)

Ratings:

Input rating:

200-240 Vac(or 100-240 Vac); 16 A ; 47-63 Hz(or 50/60 Hz)

Model CAR2548FP Series:

DC Output Ratings: 48 Vdc(or 48.5Vdc) at 52 A maximum;
Optional 3.3 Vsb at 1 A;
or 5 Vsb at 1 A

Model CAR2548TN Series:

DC Output Ratings: -54 Vdc at 46.25 A maximum;
Optional 3.3 Vsb at 1 A;
or 5 Vsb at 1 A

Maximum continuous output power not to exceed 2500 W with internal fan cooling at 50°C at input range of 180-264 Vac.

Maximum continuous output power not to exceed 1300 W with internal fan cooling at 50°C at input range of 90-180 Vac.

For CAR2548FP series; the 48V output can be rated up to 2% to include the tolerance; however the total output power remain the same as 2500W and 1300W.

Additional information (if necessary)

UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA

UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK

UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN

UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2020-05-06

Signature:

Jan-Erik Storgaard



Test Report issued under the responsibility of:



TEST REPORT

IEC 62368-1

Audio/video, information and communication technology equipment

Part 1: Safety requirements

Report Number: E252413-A6007-CB-1

Date of issue.....: 2020-05-06

Total number of pages: 88

Applicant's name.....: ABB POWER ELECTRONICS(SHANGHAI) CO LTD

Address: 1F, BLDG 58, 461 HONGCAO RD
XUHUI DISTRICT
SHANGHAI
200233 CHINA

Name of Test Laboratory: UL-CCIC Company Limited

preparing the Report: No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China

Test specification:

Standard: IEC 62368-1:2014 (Second Edition)

Test procedure: CB Scheme

Non-standard test method.....: N/A

Test Report Form No.....: IEC62368_1B

Test Report Form(s) Originator: UL(US)

Master TRF.....: 2014-03

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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test Item description :	Switching Power Supply	
Trade Mark		
Manufacturer	ABB POWER ELECTRONICS INC 601 SHILOH RD PLANO TX 75074-7210 UNITED STATES	
Model/Type reference	CAR2548FP, CAR2548TN (may be optionally followed by "B", and/or "C", and/or "A", and/or "5", and/or "-Z" or "-Z01A", and/or "-Y" or "-Y01A", see general product information for model details)	
Ratings	Input rating: 200-240 Vac(or 100-240 Vac), 16 A , 47-63 Hz(or 50/60 Hz) Model CAR2548FP Series: DC Output Ratings: 48 Vdc(or 48.5Vdc) at 52 A maximum, Optional 3.3 Vsb at 1 A; or 5 Vsb at 1 A Model CAR2548TN Series: DC Output Ratings: -54 Vdc at 46.25 A maximum, Optional 3.3 Vsb at 1 A; or 5 Vsb at 1 A Maximum continuous output power not to exceed 2500 W with internal fan cooling at 50°C at input range of 180-264 Vac. Maximum continuous output power not to exceed 1300 W with internal fan cooling at 50°C at input range of 90-180 Vac. For CAR2548FP series, the 48V output can be rated up to 2% to include the tolerance; however the total output power remain the same as 2500W and 1300W.	
Testing procedure and testing location:		
☒ CB Testing Laboratory:		
Testing location/ address	UL-CCIC Company Limited, No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China	
Tested by (name + signature).....:	Victor Liu / Project Handler	
Approved by (name + signature)	Jie Qian / Reviewer	

☐	Testing procedure: CTF Stage 1	
Testing location/ address..... :		
Tested by (name + signature).....:		
Approved by (name + signature)		
☐	Testing procedure: CTF Stage 2	
Testing location/ address..... :		
Tested by (name + signature).....:		
Witnessed by (name + signature).....:		
Approved by (name + signature)		
☐	Testing procedure: CTF Stage 3	
☐	Testing procedure: CTF Stage 4	
Testing location/ address..... :		
Tested by (name + signature).....:		
Witnessed by (name + signature).....:		
Approved by (name + signature)		
Supervised by (name + signature)		

List of Attachments (including a total number of pages in each attachment):

National Differences (30 pages)

Enclosures (42 pages)

Summary of testing:**Tests performed (name of test and test clause):**

CLASSIFICATION OF ELECTRICAL ENERGY SOURCES (5.2, 5.7)

DETERMINATION OF WORKING VOLTAGE (5.4.1.8)

BALL PRESSURE TEST (5.4.1.10.3)

HUMIDITY CONDITIONING (5.4.8)

ELECTRIC STRENGTH TEST (5.4.9)

SAFEGUARDS AGAINST CAPACITOR DISCHARGE AFTER DISCONNECTION OF A CONNECTOR (5.5.2.2)

RESISTANCE OF THE PROTECTIVE BONDING SYSTEM (5.6.6.2)

PROSPECTIVE TOUCH VOLTAGE AND TOUCH CURRENT MEASUREMENT (5.7)

INPUT TEST: SINGLE PHASE (B.2.5)

NORMAL OPERATING CONDITIONS TEMPERATURE MEASUREMENT (B.2.6)

SIMULATED ABNORMAL OPERATING CONDITIONS (B.3)

SIMULATED SINGLE FAULT CONDITIONS (B.4)

TRANSFORMER OVERLOAD (ANNEX G.5.3.3)

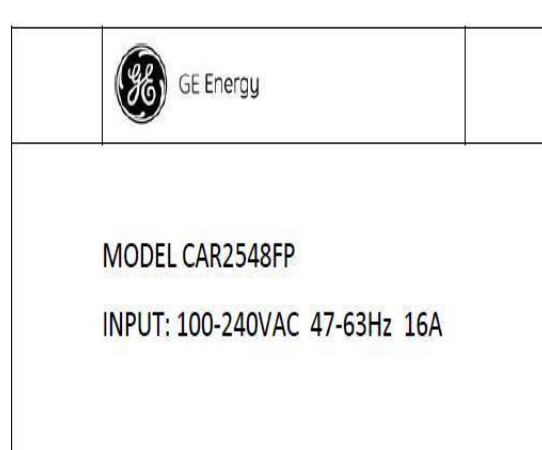
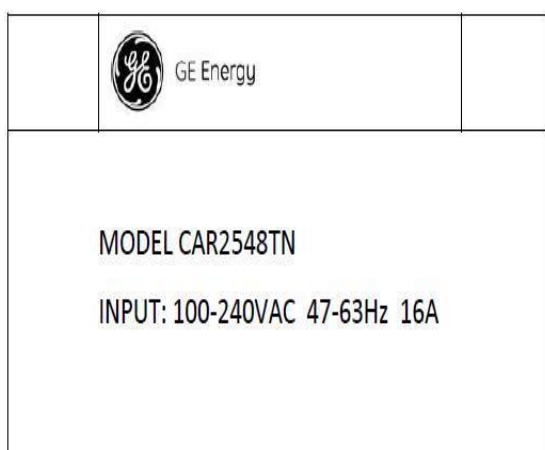
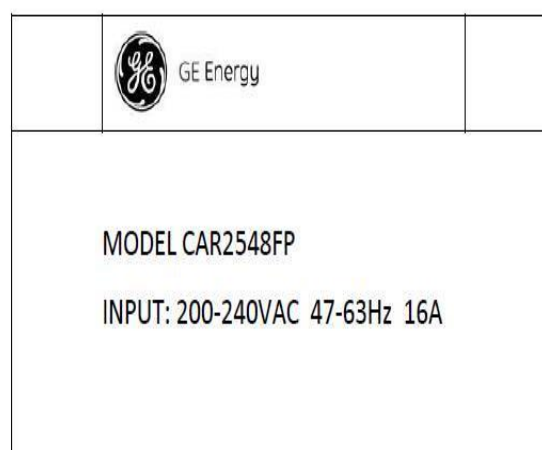
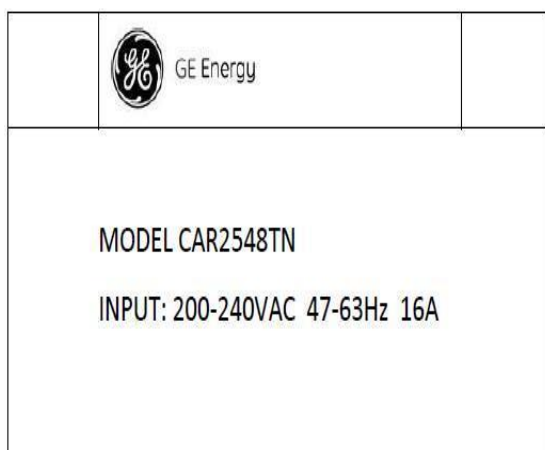
Testing Location:**CBTL: UL-CCIC Company Limited, No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China****Summary of compliance with National Differences:****List of countries addressed:** Australia / New Zealand, EU Group and National Differences, Japan, USA / Canada

EU Group and National Differences applies to CENELEC member countries: Austria , Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom

☒ **The product fulfils the requirements of:** EN 62368-1:2014 + A11:2017

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Note: The above markings are the minimum requirements required by the safety lab. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.

TEST ITEM PARTICULARS:	
Classification of use by	Instructed person
Supply Connection	AC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	Internal Connector suitable for disconnect
Considered current rating of protective device as part of building or equipment installation	30 A; building;
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Class I
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	50
IP protection class	IPX0
Power Systems	TN
Altitude during operation (m)	4000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	2.18
POSSIBLE TEST CASE VERDICTS:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement :	P (Pass)
- test object does not meet the requirement :	F (Fail)
TESTING:	
Date of receipt of test item..... :	2020-01-22
Date (s) of performance of tests..... :	2020-02-28
GENERAL REMARKS:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60335-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided :	☐ Yes ☒ Not applicable

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies)	LINEAGE POWER CHINA CO LTD NO 1353 CHEN QIAO RD SHANGHAI FENGPU INDUSTRIAL PARK SHANGHAI 201401 CHINA
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GENERAL PRODUCT INFORMATION:

Report Summary

All applicable tests according to the referenced standard(s) have been carried out.

Product Description

Component type power supply for built in, hot pluggable type input and output connection Power Supply Modules CAR2548FP and CAR2548TN, may be optionally followed by "B", and/or "C", and/or "A", and/or "5", and/or "-Z" or "-Z01A", and/or "-Y" or "-Y01A",

where: "-Z" or "-Z01A" means option for RoHS version

"-Y" or "-Y01A" means option for RoHS with Lead Free Exemption "B" means with optional Bezel

"C" means "Digital i2c" option

"A" means "controller Area Network (CAN) interface Bus" option "5" means "5Vsb/1A" option.

Model Differences

All models have similar design construction, except for the output ratings.

Additional application considerations – (Considerations used to test a component or sub-assembly) -

This report was written for upgrading standard to IEC62368-1, Second Edition, based upon previous evaluation under the CB Scheme. The CB Scheme Test Certificate DE 3-501395 and Report Ref. No. 095-72107126-000 dated June 16, 2015 was prepared by TÜV SÜD America Inc.

In the "List of Tests" include all testing done under the original investigation and add any new tests, when applicable.

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 50°C
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-10%
- The Risk Group of a lamp or lamp system (including LEDs) is : Exempt
- According to IEC60664-1, required clearances have been adjusted by multiplying the clearance at sea level by a factor of 1.29 for operating at an altitude of 4000 meters. However, the Electric Strength Test should be conducted when installed in the end product application at 4000 meters.
- The unit is a hot pluggable type; therefore, Connector Current Interruption Test was performed to this unit with 200 cycles connect and disconnection under load.

Engineering Conditions of Acceptability

When installed in an end-product, consideration must be given to the following:

- The following product-line tests are conducted for this product : Earthing Continuity, Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-Secondary: 340 Vrms/795 Vpk, Primary – Earthed Dead Metal: 336 Vrms/735 Vpk
- The following output circuits are at ES1 energy levels : All outputs
- The following output circuits are at PS3 energy levels : All outputs
- The maximum investigated branch circuit rating is : 20 A
- The investigated Pollution Degree is : 2
- Proper bonding to the end-product main protective earthing termination is : Required
- The following end-product enclosures are required : Electrical, Fire
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C) : T2, T3 and T5 are Class H
- The equipment is suitable for direct connection to : AC mains supply
- The power supply was evaluated to be used at altitudes up to : 4000 m
- ANNEX R shall be evaluated in end-product.

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:

(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.)

(Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.

Electrically-caused injury (Clause 5):

(Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification)

Example: +5 V dc input

ES1

Source of electrical energy	Corresponding classification (ES)
X capacitor connected between L and N	ES3
All circuits except for output circuits	ES3
Output circuit (connector)	ES1

Electrically-caused fire (Clause 6):

(Note: List sub-assembly or circuit designation and corresponding energy source classification)

Example: Battery pack (maximum 85 watts):

PS2

Source of power or PIS	Corresponding classification (PS)
All primary and secondary circuits	PS3, Arching PIS, Resistive PIS

Injury caused by hazardous substances (Clause 7)

(Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.)

Example: Liquid in filled component

Glycol

Source of hazardous substances	Corresponding chemical
N/A	N/A

Mechanically-caused injury (Clause 8)

(Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.)

Example: Wall mount unit

MS2

Source of kinetic/mechanical energy	Corresponding classification (MS)
N/A	N/A

Thermal burn injury (Clause 9)

(Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.)

Example: Hand-held scanner – thermoplastic enclosure

TS1

Source of thermal energy	Corresponding classification (TS)
Building-in equipment, to be evaluated in the end product	-

Radiation (Clause 10)

(Note: List the types of radiation present in the product and the corresponding energy source classification.)

Example: DVD – Class 1 Laser Product

RS1

Type of radiation	Corresponding classification (RS)
LED indicator	RS1

ENERGY SOURCE DIAGRAM

Indicate which energy sources are included in the energy source diagram. Insert diagram below

☐ **ES** ☐ **PS** ☐ **MS** ☐ **TS** ☐ **RS**

OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	Possible Hazard			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	ES3: The circuit connected to AC mains	--	--	Enclosure See 5.4.2, 5.4.3, 5.5.3 and 5.5.4
Ordinary	ES3: C3, C6, C10, C80	--	--	See 5.5.2.2
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
PCB	PS3 circuit	See 6.3	V-1 or better	N/A
Plastic materials not part of PS3 circuit	PS3 circuit	See 6.3	V-2 or better	N/A
Internal/external wiring	PS3 circuit	N/A	N/A	See 6.5
The other components/materials	PS3 circuit	See 6.3	See 6.4.5, 6.4.6	N/A
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
N/A				
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
N/A(for building-in)				
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
N/A(for building-in)				
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
N/A				
Supplementary Information:				
(1) See attached energy source diagram for additional details.				
(2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault				

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Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		Pass
4.1.1	Acceptance of materials, components and subassemblies		Pass
4.1.2	Use of components		Pass
4.1.3	Equipment design and construction		Pass
4.1.15	Markings and instructions	Building-in equipment, to be evaluated in the end product	N/A
4.4.4	Safeguard robustness	Building-in equipment, to be evaluated in the end product	N/A
4.4.4.2	Steady force tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.4.3	Drop tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.4.4	Impact tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.4.5	Internal accessible safeguard enclosure and barrier tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.4.6	Glass Impact tests	No glass	N/A
4.4.4.7	Thermoplastic material tests	Building-in equipment, to be evaluated in the end product	N/A
4.4.4.8	Air comprising a safeguard	Building-in equipment, to be evaluated in the end product	N/A
4.4.4.9	Accessibility and safeguard effectiveness	Building-in equipment, to be evaluated in the end product	N/A
4.5	Explosion		N/A
4.6	Fixing of conductors	Building-in equipment, to be evaluated in the end product	N/A
4.6.1	Fix conductors not to defeat a safeguard		N/A
4.6.2	10 N force test applied to		N/A
4.7	Equipment for direct insertion into mains socket - outlets	Building-in equipment	N/A
4.7.2	Mains plug part complies with the relevant standard		N/A
4.7.3	Torque (Nm)		N/A
4.8	Products containing coin/button cell batteries	No button cell battery	N/A
4.8.2	Instructional safeguard		N/A
4.8.3	Battery Compartment Construction		N/A
	Means to reduce the possibility of children removing the battery		—
4.8.4	Battery Compartment Mechanical Tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.8.5	Battery Accessibility		N/A
4.9	Likelihood of fire or shock due to entry of conductive object	Building-in equipment, to be evaluated in the end product	N/A
5	ELECTRICALLY-CAUSED INJURY		Pass
5.2.1	Electrical energy source classifications	(See appended table 5.2)	Pass
5.2.2	ES1, ES2 and ES3 limits		Pass
5.2.2.2	Steady-state voltage and current	See appended table 5.2)	Pass
5.2.2.3	Capacitance limits	(See appended table 5.2)	Pass
5.2.2.4	Single pulse limits		N/A
5.2.2.5	Limits for repetitive pulses		N/A
5.2.2.6	Ringling signals		N/A
5.2.2.7	Audio signals		N/A
5.3	Protection against electrical energy sources		N/A
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
5.3.2.2	Contact requirements		N/A
	a) Test with test probe from Annex V		N/A
	b) Electric strength test potential (V)		N/A
	c) Air gap (mm)		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	Insulation materials and requirements		Pass
5.4.1.2	Properties of insulating material		Pass
5.4.1.3	Humidity conditioning	(See sub-clause 5.4.8)	Pass
5.4.1.4	Maximum operating temperature for insulating materials	(See appended table 5.4.1.4)	Pass
5.4.1.5	Pollution degree	PD 2	—

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage		Pass
5.4.1.9	Insulating surfaces		N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N/A
5.4.1.10.2	Vicat softening temperature		N/A
5.4.1.10.3	Ball pressure	(See appended table 5.4.1.10.3)	N/A
5.4.2	Clearances		Pass
5.4.2.2	Determining clearance using peak working voltage	(See appended table 5.4.2.2)	Pass
5.4.2.3	Determining clearance using required withstand voltage	(See appended table 5.4.2.3)	Pass
	a) a.c. mains transient voltage	2500V	—
	b) d.c. mains transient voltage	-	—
	c) external circuit transient voltage	-	—
	d) transient voltage determined by measurement	-	—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test		N/A
5.4.2.5	Multiplication factors for clearances and test voltages.....	1.29 for clearance	Pass
5.4.3	Creepage distances	(See appended table 5.4.3)	Pass
5.4.3.1	General	(See appended table 5.4.3)	Pass
5.4.3.3	Material Group	IIIb	—
5.4.4	Solid insulation		Pass
5.4.4.2	Minimum distance through insulation	(See appended table 5.4.4.2)	Pass
5.4.4.3	Insulation compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		Pass
5.4.4.5	Cemented joints		N/A
5.4.4.6	Thin sheet material		Pass
5.4.4.6.1	General requirements		Pass
5.4.4.6.2	Separable thin sheet material		Pass
	Number of layers (pcs)	Minimum 2 layers	Pass

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.6.3	Non-separable thin sheet material		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material..... :		N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		Pass
5.4.4.9	Solid insulation at frequencies >30 kHz :		N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
	Insulation resistance (MΩ) :		—
5.4.6	Insulation of internal wire as part of supplementary safeguard :		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		Pass
	Relative humidity (%) :	93%	—
	Temperature (°C) :	40	—
	Duration (h) :	120	—
5.4.9	Electric strength test..... :	(See appended table 5.4.9)	Pass
5.4.9.1	Test procedure for a solid insulation type test		Pass
5.4.9.2	Test procedure for routine tests	The routine tests shall be conducted by manufacturer during manufacturing	N/A
5.4.10	Protection against transient voltages between external circuit		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test..... :		N/A
5.4.10.2.3	Steady-state test :		N/A
5.4.11	Insulation between external circuits and earthed circuitry :		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	Rated operating voltage U_{op} (V) :		—
	Nominal voltage U_{peak} (V) :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Max increase due to variation U_{sp}		—
	Max increase due to ageing ΔU_{sa}		—
	$U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$		—
5.5	Components as safeguards		Pass
5.5.1	General		Pass
5.5.2	Capacitors and RC units	(See Annex G.11)	Pass
5.5.2.1	General requirement		Pass
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector	(See appended table 5.5.2.2)	Pass
5.5.3	Transformers	(See Annex G.5.3)	Pass
5.5.4	Optocouplers	R/C component used.	Pass
5.5.5	Relays		N/A
5.5.6	Resistors		N/A
5.5.7	SPD's	(See Annex G.8)	Pass
5.5.7.1	Use of an SPD connected to reliable earthing		N/A
5.5.7.2	Use of an SPD between mains and protective earth		N/A
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable		N/A
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation	To be evaluated by the end product	N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm^2)		—
5.6.4	Requirement for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm^2).....	To be evaluated in the end product	—
	Protective current rating (A)	To be evaluated in the end product	—
5.6.4.3	Current limiting and overcurrent protective devices		N/A
5.6.5	Terminals for protective conductors	To be evaluated in the end product	N/A
5.6.5.1	Requirement	To be evaluated in the end product	N/A
	Conductor size (mm^2), nominal thread diameter (mm).....	To be evaluated in the end product	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.5.2	Corrosion	To be evaluated in the end product	N/A
5.6.6	Resistance of the protective system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method Resistance (Ω)	(See appended table 5.6.6.2)	N/A
5.6.7	Reliable earthing	To be evaluated in the end product	N/A
5.7	Prospective touch voltage, touch current and protective conductor current		Pass
5.7.2	Measuring devices and networks	Figure 4 of IEC 60990 used	Pass
5.7.2.1	Measurement of touch current	(See appended table 5.7.4)	Pass
5.7.2.2	Measurement of prospective touch voltage		Pass
5.7.3	Equipment set-up, supply connections and earth connections		Pass
	System of interconnected equipment (separate connections/single connection)	Single connection	—
	Multiple connections to mains (one connection at a time/simultaneous connections)	Single connection	—
5.7.4	Earthed conductive accessible parts	(See appended Table 5.7.4)	Pass
5.7.5	Protective conductor current		Pass
	Supply Voltage (V)	264 V/ 63 Hz	—
	Measured current (mA)	(See appended Table 5.7.4)	—
	Instructional Safeguard		N/A
5.7.6	Prospective touch voltage and touch current due to external circuits		N/A
5.7.6.1	Touch current from coaxial cables		N/A
5.7.6.2	Prospective touch voltage and touch current from external circuits		N/A
5.7.7	Summation of touch currents from external circuits		N/A
	a) Equipment with earthed external circuits Measured current (mA)		N/A
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA)		N/A

6	ELECTRICALLY- CAUSED FIRE		Pass
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		Pass
6.2.2	Power source circuit classifications		Pass
6.2.2.1	General	(See appended table 6.2.2)	Pass
6.2.2.2	Power measurement for worst-case load fault.....	(See appended table 6.2.2)	Pass

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.2.3	Power measurement for worst-case power source fault	(See appended table 6.2.2)	Pass
6.2.2.4	PS1		N/A
6.2.2.5	PS2		N/A
6.2.2.6	PS3	(See appended table 6.2.2)	Pass
6.2.3	Classification of potential ignition sources		Pass
6.2.3.1	Arcing PIS	Contacts of connector are considered to be an arcing PIS	Pass
6.2.3.2	Resistive PIS	All components are considered as PIS in PS3 circuits	Pass
6.3	Safeguards against fire under normal operating and abnormal operating conditions		Pass
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials	(See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6)	Pass
6.3.1 (b)	Combustible materials outside fire enclosure	Building-in equipment, to be evaluated in the end product	N/A
6.4	Safeguards against fire under single fault conditions		Pass
6.4.1	Safeguard Method		Pass
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits	No supplementary safeguards are needed for protection against PS1	Pass
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	Method "reduce the likelihood of ignition" is not used	N/A
6.4.3.1	General		N/A
6.4.3.2	Supplementary Safeguards		N/A
	Special conditions if conductors on printed boards are opened or peeled		N/A
6.4.3.3	Single Fault Conditions		N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		Pass
6.4.5	Control of fire spread in PS2 circuits		N/A
6.4.5.2	Supplementary safeguards		N/A
6.4.6	Control of fire spread in PS3 circuit		N/A
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.1	General		N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers	Building-in equipment, to be evaluated in the end product	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.8.1	Fire enclosure and fire barrier material properties		N/A
6.4.8.2.1	Requirements for a fire barrier		N/A
6.4.8.2.2	Requirements for a fire enclosure		N/A
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N/A
6.4.8.3.1	Fire enclosure and fire barrier openings		N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm)		N/A
	Needle Flame test		N/A
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm)		N/A
	Flammability tests for the bottom of a fire enclosure		N/A
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c)		N/A
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating		N/A
6.5	Internal and external wiring		N/A
6.5.1	Requirements	External wire connected to this device shall be evaluated in the end product	N/A
6.5.2	Cross-sectional area (mm ²)		—
6.5.3	Requirements for interconnection to building wiring		N/A
6.6	Safeguards against fire due to connection to additional equipment		Pass
	External port limited to PS2 or complies with Clause Q.1		N/A

7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		N/A
7.2	Reduction of exposure to hazardous substances		N/A
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards (PPE)		N/A
	Personal safeguards and instructions		—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010)		—
7.6	Batteries		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8	MECHANICALLY-CAUSED INJURY		Pass
8.1	General		Pass
8.2	Mechanical energy source classifications	Only the mass of product was considered as MS1	Pass
8.3	Safeguards against mechanical energy sources	Sharp edges and corners to be evaluated in the end product, no moving parts, fan blades and loosening, exploding or imploding parts For the installation method also to be evaluated in the end product	N/A
8.4	Safeguards against parts with sharp edges and corners	Building-in equipment, to be evaluated in the end product	N/A
8.4.1	Safeguards		N/A
8.5	Safeguards against moving parts	Fan blades was guarded by enclosure, can not be touched	N/A
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
8.5.2	Instructional Safeguard		—
8.5.4	Special categories of equipment comprising moving parts		N/A
8.5.4.1	Large data storage equipment		N/A
8.5.4.2	Equipment having electromechanical device for destruction of media		N/A
8.5.4.2.1	Safeguards and Safety Interlocks.....		N/A
8.5.4.2.2	Instructional safeguards against moving parts		N/A
	Instructional Safeguard		—
8.5.4.2.3	Disconnection from the supply		N/A
8.5.4.2.4	Probe type and force (N).....		N/A
8.5.5	High Pressure Lamps		N/A
8.5.5.1	Energy Source Classification		N/A
8.5.5.2	High Pressure Lamp Explosion Test		N/A
8.6	Stability	Building-in equipment, to be evaluated in the end product	N/A
8.6.1	Product classification		N/A
	Instructional Safeguard		—
8.6.2	Static stability		N/A
8.6.2.2	Static stability test		N/A
	Applied Force.....		—

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Clause	Requirement + Test	Result - Remark	Verdict
8.6.2.3	Downward Force Test		N/A
8.6.3	Relocation stability test		N/A
	Unit configuration during 10° tilt :		—
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test (Applied Force) :		N/A
	Position of feet or movable parts :		—
8.7	Equipment mounted to wall or ceiling	Building-in equipment, to be evaluated in the end product	N/A
8.7.1	Mounting Means (Length of screws (mm) and mounting surface) :		N/A
8.7.2	Direction and applied force :		N/A
8.8	Handles strength		N/A
8.8.1	Classification		N/A
8.8.2	Applied Force :		N/A
8.9	Wheels or casters attachment requirements		N/A
8.9.1	Classification		N/A
8.9.2	Applied force..... :		—
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions		N/A
	Instructional Safeguard :		—
8.10.3	Cart, stand or carrier loading test and compliance		N/A
	Applied force..... :		—
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Applied horizontal force (N)..... :		—
8.10.6	Thermoplastic temperature stability (°C) :		N/A
8.11	Mounting means for rack mounted equipment	Building-in equipment, to be evaluated in the end product	N/A
8.11.1	General		N/A
8.11.2	Product Classification		N/A
8.11.3	Mechanical strength test, variable <i>N</i> :		N/A
8.11.4	Mechanical strength test 250N, including end stops		N/A
8.12	Telescoping or rod antennas :		N/A
	Button/Ball diameter (mm) :		—

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Clause	Requirement + Test	Result - Remark	Verdict

9	THERMAL BURN INJURY		N/A
9.2	Thermal energy source classifications	Building-in equipment, to be evaluated in the end product	N/A
9.3	Safeguard against thermal energy sources		N/A
9.4	Requirements for safeguards		N/A
9.4.1	Equipment safeguard		N/A
9.4.2	Instructional safeguard		N/A

10	RADIATION		Pass
10.2	Radiation energy source classification	LED indicator: RS1	Pass
10.2.1	General classification		N/A
10.3	Protection against laser radiation		N/A
	Laser radiation that exists in the equipment:		—
	Normal, abnormal, single-fault		N/A
	Instructional safeguard.....		—
	Tool		—
10.4	Protection against visible, infrared, and UV radiation		N/A
10.4.1	General		N/A
10.4.1.a)	RS3 for Ordinary and instructed persons		N/A
10.4.1.b)	RS3 accessible to a skilled person		N/A
	Personal safeguard (PPE) instructional safeguard		—
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1		N/A
10.4.1.d)	Normal, abnormal, single-fault conditions		N/A
10.4.1.e)	Enclosure material employed as safeguard is opaque		N/A
10.4.1.f)	UV attenuation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.4.1.g)	Materials resistant to degradation UV		N/A
10.4.1.h)	Enclosure containment of optical radiation :		N/A
10.4.1.i)	Exempt Group under normal operating conditions :		N/A
10.4.2	Instructional safeguard :		N/A
10.5	Protection against x-radiation		N/A
10.5.1	X- radiation energy source that exists equipment:		N/A
	Normal, abnormal, single fault conditions		N/A
	Equipment safeguards		N/A
	Instructional safeguard for skilled person		N/A
10.5.3	Most unfavourable supply voltage to give maximum radiation.....		—
	Abnormal and single-fault condition.....		N/A
	Maximum radiation (pA/kg)		N/A
10.6	Protection against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output, dB(A)		N/A
	Output voltage, unweighted r.m.s.		N/A
10.6.4	Protection of persons		N/A
	Instructional safeguards		N/A
	Equipment safeguard prevent ordinary person to RS2		—
	Means to actively inform user of increase sound pressure		—
	Equipment safeguard prevent ordinary person to RS2		—
10.6.5	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.5.1	Corded passive listening devices with analog input		N/A
	Input voltage with 94 dB(A) L_{Aeq} acoustic pressure output		—
10.6.5.2	Corded listening devices with digital input		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Maximum dB(A)		—
10.6.5.3	Cordless listening device		N/A
	Maximum dB(A)		—

B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		Pass
B.2	Normal Operating Conditions		Pass
B.2.1	General requirements	(See Test Item Particulars and appended test tables)	Pass
	Audio Amplifiers and equipment with audio amplifiers		N/A
B.2.3	Supply voltage and tolerances	±10%	Pass
B.2.5	Input test	(See appended table B.2.5)	Pass
B.3	Simulated abnormal operating conditions		Pass
B.3.1	General requirements	(See appended table B.3)	Pass
B.3.2	Covering of ventilation openings		N/A
B.3.3	D.C. mains polarity test		N/A
B.3.4	Setting of voltage selector		N/A
B.3.5	Maximum load at output terminals	(See appended table B.3)	Pass
B.3.6	Reverse battery polarity		N/A
B.3.7	Abnormal operating conditions as specified in Clause E.2.		N/A
B.3.8	Safeguards functional during and after abnormal operating conditions		Pass
B.4	Simulated single fault conditions		Pass
B.4.2	Temperature controlling device open or short-circuited		N/A
B.4.3	Motor tests		N/A
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature		N/A
B.4.4	Short circuit of functional insulation		Pass
B.4.4.1	Short circuit of clearances for functional insulation		Pass
B.4.4.2	Short circuit of creepage distances for functional insulation		Pass
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors		Pass

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.6	Short circuit or disconnect of passive components		Pass
B.4.7	Continuous operation of components		N/A
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions		Pass
B.4.9	Battery charging under single fault conditions:		N/A
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation		N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure apparatus		N/A
C.2.4	Xenon-arc light exposure apparatus		N/A
D	TEST GENERATORS		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		N/A
E.1	Audio amplifier normal operating conditions		N/A
	Audio signal voltage (V):		—
	Rated load impedance (Ω):		—
E.2	Audio amplifier abnormal operating conditions		N/A
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		Pass
F.1	General requirements	Building-in equipment, to be evaluated in the end product	N/A
	Instructions – Language:		—
F.2	Letter symbols and graphical symbols		N/A
F.2.1	Letter symbols according to IEC60027-1		N/A
F.2.2	Graphic symbols IEC, ISO or manufacturer specific		N/A
F.3	Equipment markings		Pass
F.3.1	Equipment marking locations	Building-in equipment, to be evaluated in the end product	N/A
F.3.2	Equipment identification markings		Pass

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.2.1	Manufacturer identification	ABB Power Electronics Inc or E137750	—
F.3.2.2	Model identification	CAR2548FP, CAR2548TN	—
F.3.3	Equipment rating markings		Pass
F.3.3.1	Equipment with direct connection to mains		Pass
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of supply voltage	AC	—
F.3.3.4	Rated voltage	200-240 or 100-240Vac	—
F.3.3.5	Rated frequency.....	47-63Hz	—
F.3.3.6	Rated current or rated power	16A	—
F.3.3.7	Equipment with multiple supply connections		N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		Pass
F.3.5.1	Mains appliance outlet and socket-outlet markings.....	No such component used	N/A
F.3.5.2	Switch position identification marking	No such component used	N/A
F.3.5.3	Replacement fuse identification and rating markings.....	(component ID: F1 in EMI board, F1 in Main board), Ratings (20A, 250Vac)	Pass
F.3.5.4	Replacement battery identification marking	No such component used	N/A
F.3.5.5	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		Pass
F.3.6.1	Class I Equipment		Pass
F.3.6.1.1	Protective earthing conductor terminal		Pass
F.3.6.1.2	Neutral conductor terminal		N/A
F.3.6.1.3	Protective bonding conductor terminals		Pass
F.3.6.2	Class II equipment (IEC60417-5172)		N/A
F.3.6.2.1	Class II equipment with or without functional earth		N/A
F.3.6.2.2	Class II equipment with functional earth terminal marking		N/A
F.3.7	Equipment IP rating marking		—
F.3.8	External power supply output marking		N/A
F.3.9	Durability, legibility and permanence of marking		N/A
F.3.10	Test for permanence of markings		N/A
F.4	Instructions		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) Equipment for use in locations where children not likely to be present - marking	Building-in equipment, to be evaluated in the end product	N/A
	b) Instructions given for installation or initial use		N/A
	c) Equipment intended to be fastened in place		N/A
	d) Equipment intended for use only in restricted access area		N/A
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1		N/A
	f) Protective earthing employed as safeguard		N/A
	g) Protective earthing conductor current exceeding ES 2 limits		N/A
	h) Symbols used on equipment		N/A
	i) Permanently connected equipment not provided with all-pole mains switch		N/A
	j) Replaceable components or modules providing safeguard function		N/A
F.5	Instructional safeguards		N/A
	Where "instructional safeguard" is referenced in the test report it specifies the required elements, location of marking and/or instruction		N/A
G	COMPONENTS		Pass
G.1	Switches		N/A
G.1.1	General requirements		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.2	Relays		N/A
G.2.1	General requirements		N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supply power		N/A
G.2.4	Mains relay, modified as stated in G.2		N/A
G.3	Protection Devices		Pass
G.3.1	Thermal cut-offs		N/A
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Thermal cut-off connections maintained and secure		N/A
G.3.2	Thermal links		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.3.2.1a)	Thermal links separately tested with IEC 60691		N/A
G.3.2.1b)	Thermal links tested as part of the equipment		N/A
	Aging hours (H)		—
	Single Fault Condition		—
	Test Voltage (V) and Insulation Resistance (Ω) ..		—
G.3.3	PTC Thermistors		N/A
G.3.4	Overcurrent protection devices	Approved current fuse used	Pass
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions		N/A
G.4	Connectors		Pass
G.4.1	Spacings		Pass
G.4.2	Mains connector configuration	Approved connector	Pass
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
G.5	Wound Components		Pass
G.5.1	Wire insulation in wound components	Triple insulated wire	Pass
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°		Pass
G.5.1.2 b)	Construction subject to routine testing		Pass
G.5.2	Endurance test on wound components		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Time (s)		—
	Temperature (°C)		—
G.5.2.3	Wound Components supplied by mains		N/A
G.5.3	Transformers		Pass
G.5.3.1	Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1)	IEC 62368-1	N/A
	Position	T4, T2, T3, T5	—
	Method of protection	Internal protection.	—
G.5.3.2	Insulation		N/A
	Protection from displacement of windings	Triple insulation wire was used.	—
G.5.3.3	Overload test	(See appended table B.3)	Pass
G.5.3.3.1	Test conditions	(See appended table B.3)	Pass

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.3.3.2	Winding Temperatures testing in the unit	(See appended table B.3)	Pass
G.5.3.3.3	Winding Temperatures - Alternative test method		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
	Position		—
G.5.4.2	Test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4	Locked-rotor overload test		N/A
	Test duration (days)		—
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N/A
G.5.4.5.2	Tested in the unit		N/A
	Electric strength test (V)		—
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h)		N/A
	Electric strength test (V)		—
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature		N/A
	Electric strength test (V)		N/A
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h)		N/A
	Electric strength test (V)		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage		—
G.6	Wire Insulation		Pass
G.6.1	General		Pass
G.6.2	Solvent-based enamel wiring insulation	Solvent-based enamel is considered to provide functional insulation only	N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements		N/A
	Type		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A)		—
	Cross-sectional area (mm ²), (AWG)		—
G.7.2	Compliance and test method		N/A
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N)		—
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm) ... :		—
G.7.3.2.4	Strain relief comprised of polymeric material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Mass (g)		—
	Diameter (m)		—
	Temperature (°C)		—
G.7.6	Supply wiring space		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Test with 8 mm strand		N/A
G.8	Varistors		Pass
G.8.1	General requirements	Approved varistor used with V-1 material	Pass
G.8.2	Safeguard against shock		Pass
G.8.3	Safeguard against fire		N/A
G.8.3.2	Varistor overload test	Method “reduce the likelihood of ignition” is not used	N/A
G.8.3.3	Temporary overvoltage		N/A
G.9	Integrated Circuit (IC) Current Limiters		N/A
G.9.1 a)	Manufacturer defines limit at max. 5A.		N/A
G.9.1 b)	Limiters do not have manual operator or reset		N/A
G.9.1 c)	Supply source does not exceed 250 VA		—
G.9.1 d)	IC limiter output current (max. 5A)		—
G.9.1 e)	Manufacturers' defined drift		—
G.9.2	Test Program 1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.9.3	Test Program 2		N/A
G.9.4	Test Program 3		N/A
G.10	Resistors		N/A
G.10.1	General requirements		N/A
G.10.2	Resistor test		N/A
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N/A
G.10.3.1	General requirements		N/A
G.10.3.2	Voltage surge test		N/A
G.10.3.3	Impulse test		N/A
G.11	Capacitor and RC units		Pass
G.11.1	General requirements		Pass
G.11.2	Conditioning of capacitors and RC units		Pass
G.11.3	Rules for selecting capacitors	Approved X2 capacitor (C80) located between L and N Approved Y2 capacitor (C57) located between primary and PE	Pass
G.12	Optocouplers		Pass
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results)	Comply with UL1577, and IEC60747-5-52007	Pass
	Type test voltage Vini	Recognized optocouplers used	—
	Routine test voltage, Vini,b	Recognized optocouplers used	—
G.13	Printed boards		N/A
G.13.1	General requirements		N/A
G.13.2	Uncoated printed boards		N/A
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
	Compliance with cemented joint requirements (Specify construction)		—
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation.....		N/A
	Number of insulation layers (pcs)		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.13.6.2a)	Thermal conditioning		N/A
G.13.6.2b)	Electric strength test		N/A
G.13.6.2c)	Abrasion resistance test		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements		N/A
G.15	Liquid filled components		N/A
G.15.1	General requirements		N/A
G.15.2	Requirements		N/A
G.15.3	Compliance and test methods		N/A
G.15.3.1	Hydrostatic pressure test		N/A
G.15.3.2	Creep resistance test		N/A
G.15.3.3	Tubing and fittings compatibility test		N/A
G.15.3.4	Vibration test		N/A
G.15.3.5	Thermal cycling test		N/A
G.15.3.6	Force test		N/A
G.15.4	Compliance		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
G.16 a)	Humidity treatment in accordance with sc 5.4.8 – 120 hours		N/A
G.16 b)	Impulse test using circuit 2 with U_c = to transient voltage		N/A
G.16 C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N/A
G.16 C2)	Test voltage		—
G.16 D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N/A
G.16 D2)	Capacitance		—
G.16 D3)	Resistance		—
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringling signal		N/A
H.3.1.1	Frequency (Hz)		—
H.3.1.2	Voltage (V)		—

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Clause	Requirement + Test	Result - Remark	Verdict
H.3.1.3	Cadence; time (s) and voltage (V)		—
H.3.1.4	Single fault current (mA):		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V)		—
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		Pass
	General requirements		Pass
K	SAFETY INTERLOCKS		N/A
K.1	General requirements		N/A
K.2	Components of safety interlock safeguard mechanism		N/A
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A
K.5	Fail-safe		N/A
	Compliance		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Compliance and Test method		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location)		N/A
K.7.2	Overload test, Current (A)		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	DISCONNECT DEVICES		N/A
L.1	General requirements	to be evaluated in the end product	N/A
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		N/A
L.8	Multiple power sources		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		N/A
M.1	General requirements		N/A
M.2	Safety of batteries and their cells		N/A
M.2.1	Requirements		N/A
M.2.2	Compliance and test method (identify method) .. :		N/A
M.3	Protection circuits		N/A
M.3.1	Requirements		N/A
M.3.2	Tests		N/A
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
M.3.3	Compliance :		N/A
M.4	Additional safeguards for equipment containing secondary lithium battery		N/A
M.4.1	General		N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Charging operating limits		N/A
M.4.2.2a)	Charging voltage, current and temperature :		—
M.4.2.2 b)	Single faults in charging circuitry :		—
M.4.3	Fire Enclosure		N/A
M.4.4	Endurance of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation		N/A
M.4.4.3	Drop and charge/discharge function tests		N/A
	Drop		N/A
	Charge		N/A
	Discharge		N/A
M.4.4.4	Charge-discharge cycle test		N/A
M.4.4.5	Result of charge-discharge cycle test		N/A
M.5	Risk of burn due to short circuit during carrying		N/A
M.5.1	Requirement		N/A
M.5.2	Compliance and Test Method (Test of P.2.3)		N/A
M.6	Prevention of short circuits and protection from other effects of electric current		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
M.6.1	Short circuits		N/A
M.6.1.1	General requirements		N/A
M.6.1.2	Test method to simulate an internal fault		N/A
M.6.1.3	Compliance (Specify M.6.1.2 or alternative method)		N/A
M.6.2	Leakage current (mA)		N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
M.7.2	Compliance and test method		N/A
M.8	Protection against internal ignition from external spark sources of lead acid batteries		N/A
M.8.1	General requirements		N/A
M.8.2	Test method		N/A
M.8.2.1	General requirements		N/A
M.8.2.2	Estimation of hypothetical volume V_z (m ³ /s)		—
M.8.2.3	Correction factors		—
M.8.2.4	Calculation of distance d (mm)		—
M.9	Preventing electrolyte spillage		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing)		N/A
N	ELECTROCHEMICAL POTENTIALS		N/A
	Metal(s) used		—
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		Pass
	Figures O.1 to O.20 of this Annex applied.....	Complying	—
P	SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS		N/A
P.1	General requirements	To be evaluated in the end product	N/A
P.2.2	Safeguards against entry of foreign object		N/A
	Location and Dimensions (mm)		—
P.2.3	Safeguard against the consequences of entry of foreign object		N/A
P.2.3.1	Safeguards against the entry of a foreign object		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Openings in transportable equipment		N/A
	Transportable equipment with metalized plastic parts :		N/A
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) :		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General requirements		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Safeguards effectiveness		N/A
P.4	Metallized coatings and adhesive securing parts		N/A
P.4.2 a)	Conditioning testing		N/A
	Tc (°C)..... :		—
	Tr (°C) :		—
	Ta (°C) :		—
P.4.2 b)	Abrasion testing :		N/A
P.4.2 c)	Mechanical strength testing :		N/A
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		N/A
Q.1	Limited power sources		N/A
Q.1.1 a)	Inherently limited output		N/A
Q.1.1 b)	Impedance limited output		N/A
	- Regulating network limited output under normal operating and simulated single fault condition		N/A
Q.1.1 c)	Overcurrent protective device limited output		N/A
Q.1.1 d)	IC current limiter complying with G.9		N/A
Q.1.2	Compliance and test method		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A) :		—
	Current limiting method..... :		—
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General requirements		N/A
R.2	Determination of the overcurrent protective device and circuit		N/A
R.3	Test method Supply voltage (V) and short-circuit current (A)). :		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	Test specimen does not show any additional hole		N/A
S.3	Flammability test for the bottom of a fire enclosure		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Cheesecloth did not ignite		N/A
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (test condition), (°C).....		—
	Test flame according to IEC 60695-11-20 with conditions as set out		N/A
	After every test specimen was not consumed completely		N/A
	After fifth flame application, flame extinguished within 1 min		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
T	MECHANICAL STRENGTH TESTS		Pass
T.1	General requirements		Pass
T.2	Steady force test, 10 N	Applied to components.	Pass
T.3	Steady force test, 30 N		N/A
T.4	Steady force test, 100 N		N/A
T.5	Steady force test, 250 N		N/A
T.6	Enclosure impact test		N/A
	Fall test		N/A
	Swing test		N/A
T.7	Drop test		N/A
T.8	Stress relief test		N/A
T.9	Impact Test (glass)		N/A
T.9.1	General requirements		N/A
T.9.2	Impact test and compliance		N/A
	Impact energy (J)		—
	Height (m)		—
T.10	Glass fragmentation test		N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm)		—
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N/A
U.1	General requirements		N/A
U.2	Compliance and test method for non-intrinsically protected CRTs		N/A
U.3	Protective Screen		N/A
V	DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)		N/A
V.1	Accessible parts of equipment		N/A
V.2	Accessible part criterion		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests		N/A
(The following mechanical tests are conducted in the sequence noted.)			
4.8.4.2	TABLE: Stress Relief test		—
	Part	Material	Oven Temperature (°C)
4.8.4.3	TABLE: Battery replacement test		—
Battery part no. :			—
Battery Installation/withdrawal		Battery Installation/Removal Cycle	Comments
		1	
		2	
		3	
		4	
		5	
		6	
		8	
		9	
		10	
4.8.4.4	TABLE: Drop test		—
Impact Area	Drop Distance	Drop No.	Observations
		1	
		2	
		3	
4.8.4.5	TABLE: Impact		—
Impacts per surface	Surface tested	Impact energy (Nm)	Comments
4.8.4.6	TABLE: Crush test		—
Test position	Surface tested	Crushing Force (N)	Duration force applied (s)
Supplementary information:			

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.8.5	TABLE: Lithium coin/button cell batteries mechanical test result			N/A
Test position		Surface tested	Force (N)	Duration force applied (s)
Supplementary information:				

5.2		Table: Classification of electrical energy sources					Pass
5.2.2.2 – Steady State Voltage and Current conditions							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				U (Vrms or Vpk)	I (Apk or Arms)	Hz	
1	264Vac	48V output+ to -	Normal	48.7Vdc	--	--	ES1
			Abnormal	--	--	--	
			Single fault – U404 SC	48.6Vdc	--	--	
			Single fault – U404 OC	47.3Vdc	--	--	
			Single fault – U406 SC	0.4Vdc	--	--	
			Single fault – U406 OC	0.4Vdc	--	--	
			Single fault – Q14 S to D SC	48.4Vdc	--	--	
			Single fault – CR37 SC	48.4Vdc	--	--	
			Single fault – CR28 SC	0.4Vdc	--	--	
2	264Vac	3.3Vsb output+ to -	Normal	3.8Vdc	--	--	ES1
			Abnormal	--	--	--	
			Single fault – U404 SC	3.8Vdc	--	--	
			Single fault – U404 OC	3.8Vdc	--	--	
			Single fault – U406 SC	0.4Vdc	--	--	
			Single fault – U406 OC	0.4Vdc	--	--	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.2	Table: Classification of electrical energy sources						Pass
			Single fault – CR28 SC	3.3Vdc	--	--	
			Single fault –U2 SC IO	3.5Vdc	--	--	
3	264Vac	48V output+ to GND	Normal	3.1Vrms	--	63Hz	ES1
			Abnormal	--	--	--	
			Single fault – C4, C5, C11, C12, C57 OC	2.7Vrms	--	35KHz	
4	264Vac	48V output- to GND	Normal	1.8Vrms	--	63Hz	ES1
			Abnormal	--	--	--	
			Single fault – C4, C5, C11, C12, C57 OC	3.3Vrms	--	35KHz	
5	264Vac	3.3Vsb output+ to GND	Normal	1.7Vrms	--	63Hz	ES1
			Abnormal	--	--	--	
			Single fault – C4, C5, C11, C12, C57 OC	2.1Vrms	--	35KHz	
6	264Vac	3.3Vsb output- to GND	Normal	1.8Vrms	--	63Hz	ES1
			Abnormal	--	--	--	
			Single fault – C4, C5, C11, C12, C57 OC	3.3Vrms	--	35KHz	

5.2.2.3 - Capacitance Limits

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters		ES Class
				Capacitance, nF	Upk (V)	
1	264Vac/63Hz	C80 pin1 to pin2	Normal	470±20%	408Vpk	ES3
			Abnormal	--	--	
			Single fault – SC/OC			

5.2.2.4 - Single Pulses

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Duration (ms)	Upk (V)	Ipk (mA)	
			Normal				
			Abnormal				
			Single fault – SC/OC				

IEC 62368-1							
Clause		Requirement + Test			Result - Remark		Verdict
5.2		Table: Classification of electrical energy sources					Pass
5.2.2.5 - Repetitive Pulses							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Off time (ms)	Upk (V)	Ipk (mA)	
			Normal				
			Abnormal				
			Single fault – SC/OC				
Test Conditions: Normal – Abnormal - Supplementary information: SC=Short Circuit, OC=Open Circuit							

IEC 62368-1						
Clause	Requirement + Test		Result - Remark			Verdict
5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					Pass
	Supply voltage (V)	See below	See below	See below	See below	—
	Ambient T _{min} (°C)	See below	See below	See below	See below	—
	Ambient T _{max} (°C)	See below	See below	See below	See below	—
	T _{ma} (°C)	See below	See below	See below	See below	—
Maximum measured temperature T of part/at:		T (°C)				Allowed T _{max} (°C)
CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W		180V/63 Hz	180V/6 0Hz	180V/5 0Hz	180V/4 7Hz	--
INDUCTORL1 COIL		132	133	133	133	145
INDUCTORL2 COIL		118	118	118	118	145
INDUCTORL3 COIL		104	104	105	105	145
INDUCTORL4 COIL		101	100	100	100	145
INDUCTORL5 COIL		92	92	92	92	145
INDUCTORL6 COIL		70	70	71	71	145
INDUCTORL7 COIL		60	60	60	60	145
INDUCTORL8 COIL		123	123	123	123	145
INDUCTORL9 COIL		120	120	120	120	145
INDUCTORL16 COIL		127	127	127	127	145
INDUCTORL18 COIL		127	127	127	127	145
TRANSFORMER T1		78	79	78	78	90
TRANSFORMER T2 CLASS H		116	118	117	117	155
PWB under TRANSFORMER T2		95	95	95	95	130
TRANSFORMER T3 CLASS H		115	116	115	115	155
PWB under TRANSFORMER T3		114	115	115	115	130
TRANSFORMER T4		88	88	88	88	90
TRANSFORMER T5 CLASS H		113	113	113	113	155
PWB under TRANSFORMER T5		108	109	109	108	130
TRANSFORMER T101		75	76	75	75	90
TRANSFORMER T102		85	86	86	86	90
TRANSISTOR Q9 BODY		89	89	89	89	130
TRANSISTOR Q16 BODY		66	66	66	67	130

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
TRANSISTOR Q17 BODY	69	69	69	69	130
TRANSISTOR Q21 BODY	92	92	92	92	130
DIODE CR29 BODY	120	120	121	121	130
DIODE CR41 BODY	128	127	127	127	130
DIODE CR46 BODY	128	128	128	128	130
CAPACITOR C6 BODY	61	61	61	61	105
CAPACITOR C35 BODY	119	119	119	119	125
CAPACITOR C72 BODY	108	108	108	108	125
CAPACITOR C76 BODY	118	118	118	118	125
BRIDGE DIODE BR1 body	111	111	111	111	130
OUTPUT CONNECTOR J1	101	101	101	101	105
ALTERNATE INDUCTORL1 COIL	124	124	124	124	145
ALTERNATE INDUCTORL2 COIL	122	122	122	122	145
TEST AMBIENT	50	50	50	50	---
CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W	264V/63 Hz	264V/60 Hz	264V/50 Hz	264V/47 Hz	--
INDUCTORL1 COIL	97	97	97	97	145
INDUCTORL2 COIL	91	91	91	91	145
INDUCTORL3 COIL	82	82	82	83	145
INDUCTORL4 COIL	84	84	84	83	145
INDUCTORL5 COIL	87	86	86	86	145
INDUCTORL6 COIL	61	61	61	60	145
INDUCTORL7 COIL	58	58	58	58	145
INDUCTORL8 COIL	119	119	119	119	145
INDUCTORL9 COIL	114	114	114	114	145
INDUCTORL16 COIL	123	123	123	123	145
INDUCTORL18 COIL	122	122	122	122	145
TRANSFORMER T1	73	72	73	73	90
TRANSFORMER T2 CLASS H	113	113	113	113	155
PWB under TRANSFORMER T2	90	90	90	90	130
TRANSFORMER T3 CLASS H	108	108	108	108	155
PWB under TRANSFORMER T3	105	105	105	105	130
TRANSFORMER T4	82	82	82	82	90
TRANSFORMER T5 CLASS H	107	107	107	107	155
PWB under TRANSFORMER T5	103	103	103	103	130
TRANSFORMER T101	70	70	70	71	90

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
TRANSFORMER T102	80	80	80	80	90
TRANSISTOR Q9 BODY	85	84	84	84	130
TRANSISTOR Q16 BODY	61	61	61	61	130
TRANSISTOR Q17 BODY	63	63	63	63	130
TRANSISTOR Q21 BODY	86	86	86	86	130
DIODE CR29 BODY	117	116	116	116	130
DIODE CR41 BODY	121	121	121	121	130
DIODE CR46 BODY	123	123	123	123	130
CAPACITOR C6 BODY	58	58	57	57	105
CAPACITOR C35 BODY	114	114	114	114	125
CAPACITOR C72 BODY	104	104	104	104	125
CAPACITOR C76 BODY	113	113	113	113	125
BRIDGE DIODE BR1 body	93	93	93	93	130
OUTPUT CONNECTOR J1	96	96	96	96	105
ALTERNATE INDUCTORL1 COIL	91	91	91	91	145
ALTERNATE INDUCTORL2 COIL	89	89	89	90	145
TEST AMBIENT	50	50	50	50	---
CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	90V/63 Hz	90V/60 Hz	90V/50 Hz	90V/47 Hz	--
INDUCTORL1 COIL	102	102	102	102	145
INDUCTORL2 COIL	93	93	93	93	145
INDUCTORL3 COIL	84	84	84	84	145
INDUCTORL4 COIL	85	85	85	85	145
INDUCTORL5 COIL	65	65	65	65	145
INDUCTORL6 COIL	64	64	64	64	145
INDUCTORL7 COIL	58	58	58	58	145
INDUCTORL8 COIL	79	79	79	79	145
INDUCTORL9 COIL	78	79	78	78	145
INDUCTORL16 COIL	81	81	81	81	145
INDUCTORL18 COIL	82	82	82	82	145
TRANSFORMER T1	65	65	64	65	90
TRANSFORMER T2 CLASS H	80	80	80	80	155
PWB under TRANSFORMER T2	73	73	73	73	130
TRANSFORMER T3 CLASS H	84	84	84	84	155
PWB under TRANSFORMER T3	85	85	85	85	130
TRANSFORMER T4	77	77	77	77	90

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
TRANSFORMER T5 CLASS H	80	80	80	80	155
PWB under TRANSFORMER T5	80	80	80	80	130
TRANSFORMER T101	64	64	63	64	90
TRANSFORMER T102	67	67	67	67	90
TRANSISTOR Q9 BODY	67	67	67	67	130
TRANSISTOR Q16 BODY	61	61	61	61	130
TRANSISTOR Q17 BODY	63	63	63	63	130
TRANSISTOR Q21 BODY	70	70	70	70	130
DIODE CR29 BODY	82	82	82	82	130
DIODE CR41 BODY	87	87	87	87	130
DIODE CR46 BODY	88	88	88	88	130
CAPACITOR C6 BODY	58	58	58	58	105
CAPACITOR C35 BODY	80	80	80	80	125
CAPACITOR C72 BODY	77	77	77	77	125
CAPACITOR C76 BODY	80	80	80	80	125
BRIDGE DIODE BR1 body	94	94	94	94	130
OUTPUT CONNECTOR J1	75	75	75	75	105
ALTERNATE INDUCTORL1 COIL	96	96	96	96	145
ALTERNATE INDUCTORL2 COIL	95	95	94	94	145
TEST AMBIENT	50	50	50	50	--
CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	132V/63 Hz	132V/60 Hz	132V/50 Hz	132V/47 Hz	--
INDUCTORL1 COIL	79	79	79	79	145
INDUCTORL2 COIL	75	75	75	75	145
INDUCTORL3 COIL	70	70	70	70	145
INDUCTORL4 COIL	77	77	77	77	145
INDUCTORL5 COIL	63	62	62	62	145
INDUCTORL6 COIL	59	59	59	59	145
INDUCTORL7 COIL	57	57	57	57	145
INDUCTORL8 COIL	76	76	76	76	145
INDUCTORL9 COIL	76	76	76	76	145
INDUCTORL16 COIL	79	78	78	79	145
INDUCTORL18 COIL	79	79	79	79	145
TRANSFORMER T1	63	62	63	62	90
TRANSFORMER T2 CLASS H	78	78	78	78	155
PWB under TRANSFORMER T2	70	70	70	70	130

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
TRANSFORMER T3 CLASS H	80	80	80	80	155
PWB under TRANSFORMER T3	79	79	79	79	130
TRANSFORMER T4	75	74	74	74	90
TRANSFORMER T5 CLASS H	77	77	77	77	155
PWB under TRANSFORMER T5	77	76	77	77	130
TRANSFORMER T101	63	63	63	62	90
TRANSFORMER T102	65	64	64	64	90
TRANSISTOR Q9 BODY	64	64	64	64	130
TRANSISTOR Q16 BODY	58	58	58	58	130
TRANSISTOR Q17 BODY	59	59	59	59	130
TRANSISTOR Q21 BODY	67	67	67	67	130
DIODE CR29 BODY	80	80	80	80	130
DIODE CR41 BODY	84	84	84	84	130
DIODE CR46 BODY	84	84	84	84	130
CAPACITOR C6 BODY	56	55	56	56	105
CAPACITOR C35 BODY	78	77	78	78	125
CAPACITOR C72 BODY	74	74	74	74	125
CAPACITOR C76 BODY	77	77	77	77	125
BRIDGE DIODE BR1 body	81	81	81	81	130
OUTPUT CONNECTOR J1	72	72	72	72	105
ALTERNATE INDUCTORL1 COIL	76	76	76	76	145
ALTERNATE INDUCTORL2 COIL	75	75	75	75	145
TEST AMBIENT	50	50	50	50	--
CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W	180V/63 Hz	180V/ 60Hz	180V/ 50Hz	180V/4 7Hz	--
INDUCTORL1 COIL	136	136	136	136	145
INDUCTORL2 COIL	119	119	119	119	145
INDUCTORL3 COIL	111	110	111	111	145
INDUCTORL4 COIL	87	87	87	87	145
INDUCTORL5 COIL	89	89	89	89	145
INDUCTORL6 COIL	64	64	65	64	145
INDUCTORL7 COIL	57	58	58	57	145
INDUCTORL8 COIL	105	105	105	105	145
INDUCTORL9 COIL	105	105	105	105	145
INDUCTORL16 COIL	109	109	108	108	145
INDUCTORL18 COIL	109	109	109	108	145

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
TRANSFORMER T1	77	77	77	77	90
TRANSFORMER T2 CLASS H	101	101	101	101	155
TRANSFORMER T3 CLASS H	118	118	118	118	155
TRANSFORMER T4	88	88	88	88	90
TRANSFORMER T5 CLASS H	113	113	113	113	155
TRANSFORMER T101	83	83	83	83	90
TRANSFORMER T102	85	85	85	85	90
PWB under TRANSFORMER T2	87	88	88	88	130
PWB under TRANSFORMER T3	94	94	94	94	130
PWB under TRANSFORMER T5	109	109	109	109	130
TRANSISTOR Q9 BODY	71	72	72	72	130
TRANSISTOR Q16 BODY	61	61	62	61	130
TRANSISTOR Q17 BODY	67	67	67	67	130
TRANSISTOR Q21 BODY	88	88	88	88	130
DIODE CR29 BODY	106	106	106	106	130
DIODE CR41 BODY	122	122	122	122	130
DIODE CR46 BODY	108	108	108	108	130
CAPACITOR C6 BODY	60	60	60	60	105
CAPACITOR C35 BODY	100	100	100	100	125
CAPACITOR C72 BODY	96	96	96	96	125
CAPACITOR C76 BODY	102	101	102	102	125
BRIDGE DIODE BR1 body	97	97	97	97	130
OUTPUT CONNECTOR J1	102	102	102	102	105
TEST AMBIENT	50	50	50	50	--
CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W	264V/63 Hz	264V/6 0Hz	264V/5 0Hz	264V/4 7Hz	--
INDUCTORL1 COIL	95	96	97	97	145
INDUCTORL2 COIL	89	90	90	90	145
INDUCTORL3 COIL	85	86	86	86	145
INDUCTORL4 COIL	74	75	75	75	145
INDUCTORL5 COIL	82	83	83	83	145
INDUCTORL6 COIL	57	57	57	57	145
INDUCTORL7 COIL	55	56	56	56	145
INDUCTOR L8 COIL	100	100	101	101	145

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTOR L9 COIL	99	100	101	100	145
INDUCTOR L16 COIL	104	104	104	105	145
INDUCTOR L18 COIL	102	103	103	103	145
TRANSFORMER T1	71	72	72	72	90
TRANSFORMER T2 CLASS H	96	96	97	96	155
TRANSFORMER T3 CLASS H	106	106	106	106	155
TRANSFORMER T4	81	82	82	82	90
TRANSFORMER T5 CLASS H	106	107	107	107	155
TRANSFORMER T101	75	76	76	76	90
TRANSFORMER T102	78	78	78	78	90
PWB under TRANSFORMER T2	82	83	83	83	130
PWB under TRANSFORMER T3	82	82	82	82	130
PWB under TRANSFORMER T5	102	102	103	102	130
TRANSISTOR Q9 BODY	67	67	67	67	130
TRANSISTOR Q16 BODY	57	56	56	56	130
TRANSISTOR Q17 BODY	60	60	60	60	130
TRANSISTOR Q21 BODY	80	80	81	81	130
DIODE CR29 BODY	101	101	102	101	130
DIODE CR41 BODY	116	116	117	117	130
DIODE CR46 BODY	102	102	103	102	130
CAPACITOR C6 BODY	56	56	56	57	105
CAPACITOR C35 BODY	94	95	95	95	125
CAPACITOR C72 BODY	91	92	92	92	125
CAPACITOR C76 BODY	96	96	97	96	125
BRIDGE DIODE BR1 body	82	82	83	82	130
OUTPUT CONNECTOR J1	96	96	97	96	105
TEST AMBIENT	50	50	50	50	--
CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	90V/63 Hz	90V/60 Hz	90V/50 Hz	90V/47 Hz	--
INDUCTOR L1 COIL	107	107	107	107	145
INDUCTOR L2 COIL	98	98	97	97	145

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTOR L3 COIL	90	90	90	90	145
INDUCTOR L4 COIL	76	76	76	76	145
INDUCTOR L5 COIL	65	65	65	65	145
INDUCTOR L6 COIL	60	60	60	60	145
INDUCTOR L7 COIL	56	56	56	56	145
INDUCTOR L8 COIL	73	73	73	73	145
INDUCTOR L9 COIL	73	74	73	74	145
INDUCTOR L16 COIL	75	75	75	75	145
INDUCTOR L18 COIL	76	76	76	76	145
TRANSFORMER T1	65	65	65	65	90
TRANSFORMER T2 CLASS H	75	74	74	75	155
TRANSFORMER T3 CLASS H	82	82	82	82	155
TRANSFORMER T4	76	76	76	76	90
TRANSFORMER T5 CLASS H	81	81	81	81	155
TRANSFORMER T101	70	70	70	70	90
TRANSFORMER T102	73	72	72	72	90
PWB under TRANSFORMER T2	70	70	70	70	130
PWB under TRANSFORMER T3	77	77	77	77	130
PWB under TRANSFORMER T5	81	81	81	81	130
TRANSISTOR Q9 BODY	62	62	62	62	130
TRANSISTOR Q16 BODY	58	58	58	58	130
TRANSISTOR Q17 BODY	62	62	62	62	130
TRANSISTOR Q21 BODY	72	72	72	72	130
DIODE CR29 BODY	78	77	78	78	130
DIODE CR41 BODY	87	87	87	87	130
DIODE CR46 BODY	80	80	80	80	130
CAPACITOR C6 BODY	57	57	57	57	105
CAPACITOR C35 BODY	74	74	74	74	125

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
CAPACITOR C72 BODY	73	72	72	73	125
CAPACITOR C76 BODY	75	75	75	75	125
BRIDGE DIODE BR1 body	86	85	85	85	130
OUTPUT CONNECTOR J1	76	76	76	76	105
TEST AMBIENT	50	50	50	50	--
CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	132V/63 Hz	132V/6 0Hz	132V/5 0Hz	132V/4 7Hz	--
INDUCTOR L1 COIL	80	80	80	80	145
INDUCTOR L2 COIL	77	76	76	76	145
INDUCTOR L3 COIL	73	73	73	73	145
INDUCTOR L4 COIL	69	69	69	69	145
INDUCTOR L5 COIL	62	62	62	62	145
INDUCTOR L6 COIL	56	56	56	56	145
INDUCTOR L7 COIL	54	54	54	54	145
INDUCTOR L8 COIL	70	70	70	70	145
INDUCTOR L9 COIL	72	71	71	71	145
INDUCTOR L16 COIL	72	72	72	72	145
INDUCTOR L18 COIL	73	73	73	72	145
TRANSFORMER T1	62	62	62	62	90
TRANSFORMER T2 CLASS H	72	72	72	72	155
TRANSFORMER T3 CLASS H	78	78	78	78	155
TRANSFORMER T4	73	73	73	73	90
TRANSFORMER T5 CLASS H	77	77	77	77	155
TRANSFORMER T101	66	65	65	65	90
TRANSFORMER T102	68	68	68	68	90
PWB under TRANSFORMER T2	67	67	67	67	130
PWB under TRANSFORMER T3	71	71	71	71	130

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
PWB under TRANSFORMER T5	77	77	77	77	130
TRANSISTOR Q9 BODY	60	59	60	59	130
TRANSISTOR Q16 BODY	55	55	55	55	130
TRANSISTOR Q17 BODY	57	57	57	57	130
TRANSISTOR Q21 BODY	68	68	68	68	130
DIODE CR29 BODY	75	75	75	75	130
DIODE CR41 BODY	84	84	84	84	130
DIODE CR46 BODY	76	76	76	76	130
CAPACITOR C6 BODY	55	55	55	55	105
CAPACITOR C35 BODY	71	71	71	71	125
CAPACITOR C72 BODY	70	70	70	70	125
CAPACITOR C76 BODY	72	72	72	72	125
BRIDGE DIODE BR1 body	74	74	74	74	130
OUTPUT CONNECTOR J1	73	73	73	73	105
TEST AMBIENT	50	50	50	50	--
CAR2548FP series OUTPUT at low line input: 48V/27.1A, 5Vsb/1A 1300W	90V/63 Hz At 30 ° C	90V/60 Hz At 30 ° C	90V/50 Hz At 30 ° C	90V/47 Hz At 30 ° C	--
INDUCTOR L1 COIL	95	95	94	94	125
INDUCTOR L2 COIL	93	93	92	93	125
INDUCTOR L3 COIL	77	77	77	77	125
INDUCTOR L4 COIL	51	51	51	51	125
INDUCTOR L5 COIL	47	47	47	47	125
INDUCTOR L6 COIL	44	44	44	44	125
INDUCTOR L7 COIL	44	44	44	43	125
INDUCTOR L8 COIL	68	69	69	69	125
INDUCTOR L9 COIL	64	64	64	64	125
INDUCTOR L16 COIL	65	65	65	65	125

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTOR L18 COIL	62	62	62	62	125
TRANSFORMER T1	48	48	48	48	70
TRANSFORMER T2 CLASS H	68	68	68	68	135
PWB under TRANSFORMER T2	53	53	53	53	110
TRANSFORMER T3 CLASS H	79	79	79	79	135
PWB under TRANSFORMER T3	62	62	62	62	110
TRANSFORMER T4	57	58	58	58	70
TRANSFORMER T5 CLASS H	69	69	70	70	135
PWB under TRANSFORMER T5	68	68	68	68	110
TRANSFORMER T101	56	56	57	56	70
TRANSFORMER T102	59	59	59	59	70
TRANSISTOR Q9 BODY	49	49	49	49	110
TRANSISTOR Q16 BODY	49	49	49	50	110
TRANSISTOR Q17 BODY	48	48	48	48	110
TRANSISTOR Q21 BODY	51	51	51	51	110
DIODE CR29 BODY	66	66	66	66	110
DIODE CR41 BODY	74	74	74	74	110
DIODE CR46 BODY	79	79	79	79	110
CAPACITOR C6 BODY	43	43	43	43	85
CAPACITOR C35 BODY	66	66	66	66	105
CAPACITOR C72 BODY	57	57	57	57	105
CAPACITOR C76 BODY	63	63	63	63	105
BRIDGE DIODE BR1 body	74	74	74	74	110
RELAY K1 body	45	45	45	45	70
FUSE F1 BODY	83	83	83	83	105
OUTPUT CONNECTOR J1	69	69	69	69	85
TEST AMBIENT	30	30	30	30	--
CAR2548FP series OUTPUT at low line input: 48V/27.1A, 5Vsb/1A 1300W	132V/63 Hz At 30 ° C	132V/6 0Hz At 30 ° C	132V/5 0Hz At 30 ° C	132V/4 7Hz At 30 ° C	--
INDUCTOR L1 COIL	62	62	62	62	125
INDUCTOR L2 COIL	62	62	62	62	125

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
INDUCTOR L3 COIL	55	55	55	55	125
INDUCTOR L4 COIL	46	46	46	46	125
INDUCTOR L5 COIL	44	44	44	44	125
INDUCTOR L6 COIL	38	39	38	39	125
INDUCTOR L7 COIL	41	41	41	41	125
INDUCTOR L8 COIL	65	66	66	66	125
INDUCTOR L9 COIL	61	61	61	61	125
INDUCTOR L16 COIL	62	62	62	62	125
INDUCTOR L18 COIL	59	59	59	59	125
TRANSFORMER T1	44	44	44	44	70
TRANSFORMER T2 CLASS H	66	66	66	66	135
PWB under TRANSFORMER T2	49	50	49	49	110
TRANSFORMER T3 CLASS H	73	73	73	73	135
PWB under TRANSFORMER T3	58	58	58	58	110
TRANSFORMER T4	52	52	52	52	70
TRANSFORMER T5 CLASS H	65	66	66	66	135
PWB under TRANSFORMER T5	64	64	64	64	110
TRANSFORMER T101	52	52	52	52	70
TRANSFORMER T102	55	55	55	55	70
TRANSISTOR Q9 BODY	46	46	46	46	110
TRANSISTOR Q16 BODY	43	43	43	43	110
TRANSISTOR Q17 BODY	42	42	42	42	110
TRANSISTOR Q21 BODY	47	47	47	47	110
DIODE CR29 BODY	63	63	63	64	110
DIODE CR41 BODY	70	70	70	70	110
DIODE CR46 BODY	74	74	74	74	110
CAPACITOR C6 BODY	38	38	38	38	85
CAPACITOR C35 BODY	63	63	63	63	105

IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
CAPACITOR C72 BODY	54	54	54	54	54	105	
CAPACITOR C76 BODY	60	60	60	60	60	105	
BRIDGE DIODE BR1 body	60	60	60	60	60	110	
RELAY K1 body	41	41	41	41	41	70	
FUSE F1 BODY	59	59	59	59	59	105	
OUTPUT CONNECTOR J1	58	58	58	58	58	85	
TEST AMBIENT	30	30	30	30	30	--	
Supplementary information:							
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
Supplementary information:							
Note 1: Tma should be considered as directed by applicable requirement							
Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9)							

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			N/A
Penetration (mm).....:				—
Object/ Part No./Material		Manufacturer/t rademark	T softening (°C)	
supplementary information:				

IEC 62368-1				
Clause	Requirement + Test		Result - Remark	Verdict
5.4.1.10.3	TABLE: Ball pressure test of thermoplastics			Pass
Allowed impression diameter (mm)		≤ 2 mm		—
Object/Part No./Material	Manufacturer/trademark	Test temperature (°C)	Impression diameter (mm)	
Bobbin/Header material made by E I Dupont, Cat. No. FR530	--	125	1.5	
Header material made by E I Dupont, Cat. No. FR515	--	125	1.4	
Header material Phenolic, Chang chun Plastic, T373J	--	125	1.2	
Bobbin material made by RTP, Cat. No. RTP205FR	--	125	0.6	
Input/Output Connector made by MOLEX , cat.no. 87663 series	--	125	1.2	
Alternate Input/Output Connector made by FCI USA, Power-blade series	--	125	1.1	
Alternate Input/Output Connector made by Tyco, Multi-beam XL series	--	125	1.2	
Supplementary information:				
standarized materials				

5.4.2.2, 5.4.2.4 and 5.4.3	TABLE: Minimum Clearances/Creepage distance						Pass
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Frequency (kHz) ¹	Required cl (mm)	cl (mm) ²	Required ³ cr (mm)	cr (mm)
CAR2548FP MAIN POWER BD. PRIMARY TO SECONDARY (REINFORCED INSULATION)	--	--	--	--	--	--	--
T4 PIN 6 to T4 PIN 2	+465 -0	303	139	* 3.9	7.0	6.5	7.0
T4 PIN 5 to T4 PIN 2	+795 - 390	332	139	* 3.9	8.0	7.0	8.0
T4 PIN 7 to T4 PIN 2	+45 - 405	184	139	* 3.9	7.0	5.2	7.0
T4 PIN 8 to T4 PIN 2	+75 - 385	184	139	* 3.9	7.0	5.2	7.0
T4 PIN 6 to T4 PIN 1	+415 - 15	302	139	* 3.9	7.0	6.5	7.0
T4 PIN 5 to T4 PIN 1	+735 - 405	340	139	* 3.9	8.0	7.1	8.0

IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
T4 PIN 7 to T4 PIN 1	+55 - 435	187	139	* 3.9	7.0	5.5	7.0
T4 PIN 8 to T4 PIN 1	+35 - 375	185	139	* 3.9	7.0	5.2	7.0
T4 PIN 6 to T4 PIN 3	+475 - 15	303	139	* 3.9	7.0	6.6	7.0
T4 PIN 5 to T4 PIN 3	+725 - 345	330	139	* 3.9	8.0	7.0	8.0
T4 PIN 7 to T4 PIN 3	+35 - 395	183	139	* 3.9	7.0	5.2	7.0
T4 PIN 8 to T4 PIN 3	+105 - 385	186	139	* 3.9	7.0	5.2	7.0
T4 PIN 6 to T4 PIN 4	+415 - 15	303	139	* 3.9	7.0	6.5	7.0
T4 PIN 5 to T4 PIN 4	+735 - 395	339	139	* 3.9	8.0	7.1	8.0
T4 PIN 7 to T4 PIN 4	+55 - 445	187	139	* 3.9	7.0	5.5	7.0
T4 PIN 8 to T4 PIN 4	+35 - 375	184	139	* 3.9	7.0	5.2	7.0
T4 PIN 6 to T4 PIN E1	+455 - 65	265	139	* 3.9	7.0	5.5	7.0
T4 PIN 5 to T4 PIN E1	+675 - 405	292	139	* 3.9	8.0	6.4	8.0
T4 PIN 7 to T4 PIN E1	+50 - 435	215	139	* 3.9	7.0	5.5	7.0
T4 PIN 8 to T4 PIN E1	+75 - 445	219	139	* 3.9	7.0	5.5	7.0
T4 PIN 6 to T4 PIN E2	+365 - 55	263	139	* 3.9	7.0	5.5	7.0
T4 PIN 5 to T4 PIN E2	+675 - 455	302	139	* 3.9	8.0	6.5	8.0
T4 PIN 7 to T4 PIN E2	+0 -505	218	139	* 3.9	7.0	5.7	7.0
T4 PIN 8 to T4 PIN E2	+0 -425	215	139	* 3.9	7.0	5.5	7.0
T5-1 PIN to T5 PIN 1	+445 - 485	218	<30	* 3.9	8.0	5.5	8.0
T5-2 PIN to T5 PIN 1	+425 - 465	195	<30	* 3.9	8.0	5.5	8.0
T5-1 PIN to T5 PIN 2	+515 - 505	253	<30	* 3.9	8.0	5.7	8.0
T5-2 PIN to T5 PIN 2	+445 - 475	203	<30	* 3.9	8.0	5.5	8.0

IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
T5-1 PIN to T5 PIN 4	+595 - 515	291	< 30	* 3.9	8.0	6.4	8.0
T5-2 PIN to T5 PIN 4	+455 - 495	225	< 30	* 3.9	8.0	5.7	8.0
T2-1 PIN to T2 PIN 1	+415 - 450	196	< 30	* 3.9	8.0	5.5	8.0
T2-2 PIN to T2 PIN 1	+375 - 425	225	< 30	* 3.9	8.0	5.5	8.0
T2-1 PIN to T2 PIN 2	+435 - 455	204	< 30	* 3.9	8.0	5.5	8.0
T2-2 PIN to T2 PIN 2	+400 - 425	202	< 30	* 3.9	8.0	5.5	8.0
T2-1 PIN to T2 PIN 4	+445 - 465	225	< 30	* 3.9	8.0	5.5	8.0
T2-2 PIN to T2 PIN 4	+415 - 435	196	< 30	* 3.9	8.0	5.5	8.0
T3-1 PIN to T3 PIN 1	+385 - 425	224	< 30	* 3.9	8.0	5.5	8.0
T3-2 PIN to T3 PIN 1	+515 - 435	291	< 30	* 3.9	8.0	6.4	8.0
T3-1 PIN to T3 PIN 2	+400 - 425	204	< 30	* 3.9	8.0	5.5	8.0
T3-2 PIN to T3 PIN 2	+435 - 425	251	< 30	* 3.9	8.0	5.5	8.0
T3-1 PIN to T3 PIN 4	+415 - 425	199	< 30	* 3.9	8.0	5.5	8.0
T3-2 PIN to T3 PIN 4	+380 - 425	220	< 30	* 3.9	8.0	5.5	8.0
T1 PIN 3 (DC-) to T1 PIN 2	+35 - 385	184	< 30	* 3.9	5.8	5.2	5.8
T1 PIN 4 to T4 PIN E1	+75 - 455	221	< 30	* 3.9	5.8	5.5	5.8
J102 PIN 2 to J101 PIN 5	+45 - 395	185	< 30	* 3.9	5.5	5.2	5.5
C45 + to T4 PIN 4	+45 - 365	176	< 30	* 3.9	6.0	5.2	6.0
T1 PIN 3 to J402 PIN 1	+35 - 375	188	< 30	* 3.9	6.4	5.2	6.4
J401 PIN 16 to J402 PIN 1	+55 - 375	190	< 30	* 3.9	5.7	5.2	5.7
CAR2548FP MAIN POWER BD.	--	--	--	--	--	--	--
PRIMARY TO CHASSIS (BASIC INSULATION)	--	--	--	--	--	--	--

IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
T4 PIN 6 to CHASSIS	+405 -0	298	139	* 2.0	4.0	3.2	4.0
T4 PIN 5 to CHASSIS	+735 - 415	336	139	* 2.0	4.0	3.5	4.0
T4 PIN 7 to CHASSIS	+45 - 455	187	139	* 2.0	4.0	2.8	4.0
T4 PIN 8 to CHASSIS	+35 - 375	184	139	* 2.0	4.0	2.6	4.0
T5-1 PIN to CHASSIS	+505 - 455	251	< 30	* 2.0	4.0	2.9	4.0
T5-2 PIN to CHASSIS	+445 - 395	228	< 30	* 2.0	4.0	2.8	4.0
T2-1 PIN to CHASSIS	+445 - 405	227	< 30	* 2.0	4.0	2.8	4.0
T2-2 PIN to CHASSIS	+425 - 405	228	< 30	* 2.0	4.0	2.8	4.0
T3-1 PIN to CHASSIS	+425 - 395	227	< 30	* 2.0	4.0	2.8	4.0
T3-2 PIN to CHASSIS	+415 - 375	249	< 30	* 2.0	4.0	2.6	4.0
Q3 D to CHASSIS	+415 - 375	210	< 30	* 2.0	4.0	2.6	4.0
C4 + to CHASSIS	+415 -0	298	< 30	* 2.0	4.0	3.2	4.0
C4 - to CHASSIS	+0 -375	185	< 30	* 2.0	4.0	2.6	4.0
CR6 C to CHASSIS	+405 -0	192	< 30	* 2.0	4.0	2.6	4.0
CAR2548FP MAIN POWER BD. PRIMARY TO PRIMARY (FUNCTIONAL INSULATION)	--	--	--	--	--	--	--
Q3 D to Q3 S	+405 – 0	283	< 30	* 2.0	** 2900Vdc	3.2	** 2900Vdc
Q7 D to Q7 S	+415 – 0	273	< 30	* 2.0	** 2900Vdc	3.2	** 2900Vdc
Q8 D to Q8 S	+405 – 0	275	< 30	* 2.0	** 2900Vdc	3.2	** 2900Vdc
Q6 D to Q6 S	+735 – 55	414	< 30	* 2.6	** 3700Vdc	4.2	** 3700Vdc
C4 + to C4 -	+405 – 0	383	< 30	* 2.0	** 2900Vdc	4.0	** 2900Vdc
Supplementary information:							
Note 1: Only for frequency above 30 kHz							
Note 2: See table 5.4.2.4 if this is based on electric strength test							
Note 3: Provide Material Group							

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

FI: Functional insulation; BI: Basic insulation; SI: Supplementary insulation; RI: Reinforced insulation

* The required clearances have been adjusted by multiplying the clearance requirement at sea level by factor of 1.29 for operating altitude of 4000 meter.

** The Dielectric Strength Test for deficiency spacing has also been adjusted by a multiplying factor of 1.24 for operating altitude of 4000 meter. Hipot Test time: 1 minute.

5.4.2.3	TABLE: Minimum Clearances distances using required withstand voltage			N/A
	Overvoltage Category (OV):			
	Pollution Degree:			
Clearance distanced between:		Required withstand voltage	Required cl (mm)	Measured cl (mm)
Supplementary information:				

5.4.2.4	TABLE: Clearances based on electric strength test			N/A
Test voltage applied between:	Required cl (mm)	Test voltage (kV) peak/ r.m.s. / d.c.	Breakdown Yes / No	
Supplementary information:				

5.4.4.2, 5.4.4.5 c) 5.4.4.9	TABLE: Distance through insulation measurements					N/A
Distance through insulation di at/of:	Peak voltage (V)	Frequency (kHz)	Material	Required DTI (mm)	DTI (mm)	
Supplementary information:						
No solid insulation used.						
Triple Insulated Wire used in transformer, tapes not used for insulation.						

5.4.9	TABLE: Electric strength tests			Pass
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No
Functional:				
Q6 D to Q6 S		DC	* 3100Vdc	No
Q8 D to Q8 S		DC	* 2900Vdc	No
Q7 D to Q7 S		DC	* 2900Vdc	No

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.9	TABLE: Electric strength tests		Pass
Test voltage applied between:	Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No
C4 (+) to C4 (-)	DC	* 2900Vdc	No
Secondary traces to secondary traces	DC	1000Vdc	No
Secondary traces to chassis	DC	1000Vdc	No
Basic/supplementary:			
Power supply CAR2548TN series and CAR2548FP series AC input to chassis enclosure	DC	3100 Vdc	No
Test conducted on 1 layer of NOMEX insulator for Basic insulation between PWB and chassis	DC	3100 Vdc	No
Test conducted on 1 layer of FORMEX GK insulator for Basic insulation between PWB and chassis	DC	3100 Vdc	No
Test conducted on 1 layer of Kapton tape Permacel, cat.no. P221 and P222	DC	3100 Vdc	No
Test conducted on 1 layer of alternate Kapton tape Ideal, cat.no. 7170 and 7270	DC	3100 Vdc	No
Test conducted on 1 layer of alternate Kapton tape Changshu Fubang, cat.no. FK-01 series	DC	3100 Vdc	No
Test conducted on 1 layer of alternate Kapton tape Suzhou Creative, cat.no. KPT201 series	DC	3100 Vdc	No
Sleeving covering internal wires for Supplementary insulation	DC	3100 Vdc	No
Reinforced:			
Power supply CAR2548TN series and CAR2548FP series AC input to secondary outputs (with Y-caps removed).	DC	4300 Vdc	No
CAR2548TN series and CAR2548FP series Transformers T1, T2, T3, T4, T5, T101, T102 primary to secondary winding.	DC	4300 Vdc	No
Routine Tests:			
Supplementary information:			
** The required clearances have been adjusted by multiplying the clearance requirement at sea level by factor of 1.29 for operating altitude of 4000 meter. * The dielectric strength test for deficiency spacing has also been adjusted by a multiplying factor of 1.24 for operating altitude of 4000 meter			

5.5.2.2	TABLE: Stored discharge on capacitors	Pass
----------------	--	------

IEC 62368-1					
Clause	Requirement + Test			Result - Remark	Verdict
Supply Voltage (V), Hz	Test Location	Operating Condition (N, S)	Switch position On or off	Measured Voltage (after 2 seconds)	ES Classification
264V, 63HZ	L to N	N	N/A	0	ES1
264V, 63HZ	L to N	R88 OC	N/A	0	ES1
264V, 63HZ	L to N	TZ1 OC	N/A	0	ES1
264V, 63HZ	L to N	RT1 OC	N/A	8V	ES1
Supplementary information:					
X-capacitors installed for testing are: bleeding resistor rating: R87, R88, R89=100k Ω , RT1=10 Ω ICX: N/A Notes: A. Test Location: Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth B. Operating condition abbreviations: N – Normal operating condition (e.g., normal operation, or open fuse); S –Single fault condition					

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.6.6.2	TABLE: Resistance of protective conductors and terminations			N/A
Accessible part	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
Supplementary information:				

5.7.2.2, 5.7.4	TABLE: Earthed accessible conductive part		Pass
Supply voltage :			—
Location	Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7	Touch current (mA)	
	1	Normal:4.16m Apk Reverse:4.16 mApk	
	2*		
	3		
	4		
	5		
	6		
	8		
Supplementary Information:			
Notes: [1] Supply voltage is the anticipated maximum Touch Voltage [2] Earthed neutral conductor [Voltage differences less than 1% or more] [3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3 [4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable. [5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.			

IEC 62368-1					
Clause	Requirement + Test			Result - Remark	Verdict
6.2.2	Table: Electrical power sources (PS) measurements for classification				N/A
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s ^{*)}	PS Classification
A		Power (W) :			
		V _A (V) :			
		I _A (A) :			
Supplementary Information:					
(*) Measurement taken only when limits at 3 seconds exceed PS1 limits					

6.2.3.1	Table: Determination of Potential Ignition Sources (Arcing PIS)				N/A
Location		Open circuit voltage After 3 s (V _p)	Measured r.m.s current (I _{rms})	Calculated value (V _p × I _{rms})	Arcing PIS? Yes / No
Supplementary information:					
An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V _p) and normal operating condition rms current (I _{rms}) is greater than 15.					

6.2.3.2	Table: Determination of Potential Ignition Sources (Resistive PIS)				N/A
Circuit Location (x-y)	Operating Condition (Normal / Describe Single Fault)	Measured wattage or VA During first 30 s (W / VA)	Measured wattage or VA After 30 s (W / VA)	Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment)	Resistive PIS? Yes/No
Supplementary Information:					
A combination of voltmeter, VA and ammeter I _A may be used instead of a wattmeter. If a separate voltmeter and ammeter are used, the product of (V _A × I _A) is used to determine Resistive PIS classification. A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.					

8.5.5	TABLE: High Pressure Lamp		N/A
Description		Values	Energy Source Classification
Lamp type			—
Manufacturer			—

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Cat no.:		—	
Pressure (cold) (MPa)		MS_	
Pressure (operating) (MPa)		MS_	
Operating time (minutes)		—	
Explosion method		—	
Max particle length escaping enclosure (mm) .:		MS_	
Max particle length beyond 1 m (mm).....:		MS_	
Overall result			
Supplementary information:			

B.2.5 TABLE: Input test									Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
90V 63 Hz	--	12.794	--	1150.3	--	F1 rated 20A	12.794	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	
100V 63 Hz	--	11.412	16	1138.1	--	F1 rated 20A	11.412	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	
120V 63 Hz	--	9.409	16	1124.9	--	F1 rated 20A	9.409	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	
132V 63 Hz	--	8.504	--	1118.4	--	F1 rated 20A	8.504	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	
90V 60 Hz	--	12.799	--	1150.7	--	F1 rated 20A	12.799	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	
100V 60 Hz	--	11.414	16	1138.5	--	F1 rated 20A	11.414	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	
120V 60 Hz	--	9.406	16	1124.4	--	F1 rated 20A	9.406	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.2.5 TABLE: Input test								Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
132V 60 Hz	--	8.507	--	1118.1	--	F1 rated 20A	8.507	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
90V 50 Hz	--	12.814	--	1150.6	--	F1 rated 20A	12.814	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
100V 50 Hz	--	11.434	16	1138.4	--	F1 rated 20A	11.434	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
120V 50 Hz	--	9.427	16	1123.8	--	F1 rated 20A	9.427	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
132V 50 Hz	--	8.530	--	1117.4	--	F1 rated 20A	8.530	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
90V 47 Hz	--	12.826	--	1150.6	--	F1 rated 20A	12.826	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
100V 47 Hz	--	11.446	16	1138.4	--	F1 rated 20A	11.446	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
120V 47 Hz	--	9.441	16	1123.8	--	F1 rated 20A	9.441	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
132V 47 Hz	--	8.542	--	1117.0	--	F1 rated 20A	8.542	CAR2548FP series OUTPUT: 48V/20.8A, 3.3V/1A 1000W
180V 63 Hz	--	15.489	--	2773.0	--	F1 rated 20A	15.489	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 63 Hz	--	13.836	16	2750.0	--	F1 rated 20A	13.836	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.2.5 TABLE: Input test								Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
240V 63 Hz	--	11.471	16	2726.0	--	F1 rated 20A	11.471	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
264V 63 Hz	--	10.374	--	2715.0	--	F1 rated 20A	10.374	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 60 Hz	--	15.495	--	2773.0	--	F1 rated 20A	15.495	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 60 Hz	--	13.847	16	2750.0	--	F1 rated 20A	13.847	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
240V 60 Hz	--	11.478	16	2726.0	--	F1 rated 20A	11.478	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
264V 60 Hz	--	10.388	--	2717.0	--	F1 rated 20A	10.388	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 50 Hz	--	15.564	--	2774.0	--	F1 rated 20A	15.564	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 50 Hz	--	13.906	16	2750.0	--	F1 rated 20A	13.906	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
240V 50 Hz	--	11.536	16	2726.0	--	F1 rated 20A	11.536	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
264V 60 Hz	--	10.433	--	2716.0	--	F1 rated 20A	10.433	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 60 Hz	--	15.598	--	2774.0	--	F1 rated 20A	15.598	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
200V 60 Hz	--	13.924	16	2751.0	--	F1 rated 20A	13.924	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
240V 60 Hz	--	11.544	16	2727.0	--	F1 rated 20A	11.544	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict

B.2.5	TABLE: Input test							Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
264V 60 Hz	--	10.465	--	2716.0	--	F1 rated 20A	10.465	CAR2548FP series OUTPUT: 48V/52A, 3.3V/1A 2500W
180V 60 Hz	--	13.014	--	1170.1	--	F1 rated 20A	13.014	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
200V 60 Hz	--	11.583	16	1156.5	--	F1 rated 20A	11.583	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
240V 60 Hz	--	9.545	16	1140.7	--	F1 rated 20A	9.545	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
264V 60 Hz	--	8.635	--	1135.7	--	F1 rated 20A	8.635	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
90V 50 Hz	--	13.015	--	1170.5	--	F1 rated 20A	13.015	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
100V 50 Hz	--	11.580	16	1155.9	--	F1 rated 20A	11.580	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
120V 50 Hz	--	9.537	16	1140.1	--	F1 rated 20A	9.537	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
132V 50 Hz	--	8.634	--	1135.3	--	F1 rated 20A	8.634	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W
90V 50 Hz	--	13.018	--	1170.1	--	F1 rated 20A	13.018	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W

IEC 62368-1									
Clause		Requirement + Test				Result - Remark		Verdict	
B.2.5	TABLE: Input test								Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
100V 50 Hz	--	11.587	16	1156.1	--	F1 rated 20A	11.587	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	
120V 50 Hz	--	9.552	16	1139.1	--	F1 rated 20A	9.552	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	
132V 50 Hz	--	8.653	--	1135.2	--	F1 rated 20A	8.653	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	
90V 50 Hz	--	13.027	--	1170.5	--	F1 rated 20A	13.027	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	
100V 50 Hz	--	11.593	16	1155.7	--	F1 rated 20A	11.593	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	
120V 50 Hz	--	9.564	16	1139.0	--	F1 rated 20A	9.564	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	
132V 50 Hz	--	8.659	--	1134.3	--	F1 rated 20A	8.659	CAR2548TN series OUTPUT: -54V/18.5A, 3.3V/1A 1000W	
90V 50 Hz	--	15.411	--	2758.0	--	F1 rated 20A	15.411	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W	
100V 50 Hz	--	13.776	16	2736.0	--	F1 rated 20A	13.776	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W	
120V 50 Hz	--	11.431	16	2717.0	--	F1 rated 20A	11.431	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.2.5 TABLE: Input test								Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
132V 50 Hz	--	10.352	--	2703.0	--	F1 rated 20A	10.352	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
180V 50 Hz	--	15.417	--	2758.0	--	F1 rated 20A	15.417	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
200V 50 Hz	--	13.783	16	2735.0	--	F1 rated 20A	13.783	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
240V 50 Hz	--	11.434	16	2714.0	--	F1 rated 20A	11.434	CAR2548TN series OUTPUT: - 54V/46.25A, 3.3V/1A 2500W
264V 60 Hz	--	10.360	--	2702.0	--	F1 rated 20A	10.360	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
180V 50 Hz	--	15.471	--	2758.0	--	F1 rated 20A	15.471	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
200V 50 Hz	--	13.845	16	2736.0	--	F1 rated 20A	13.845	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
240V 50 Hz	--	11.488	16	2714.0	--	F1 rated 20A	11.488	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
264V 50 Hz	--	10.417	--	2703.0	--	F1 rated 20A	10.417	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
180V 47 Hz	--	15.507	--	2759.0	--	F1 rated 20A	15.507	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.2.5 TABLE: Input test								Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
200V 47 Hz	--	13.876	16	2737.0	--	F1 rated 20A	13.876	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
240V 47 Hz	--	11.519	16	2714.0	--	F1 rated 20A	11.519	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
264V 47 Hz	--	10.443	--	2703.0	--	F1 rated 20A	10.443	CAR2548TN series OUTPUT: -54V/46.25A, 3.3V/1A 2500W
90V, 63Hz	--	16.396A	--	1512.5W	--	F1 rated 20A	16.396A	48V/27.1A 5Vsb/1A 1300W
100V, 63Hz	--	14.545A	16	1483.9W	--	F1 rated 20A	14.545A	48V/27.1A 5Vsb/1A 1300W
120V, 63Hz	--	11.972A	16	1456.5W	--	F1 rated 20A	11.972A	48V/27.1A 5Vsb/1A 1300W
132V, 63Hz	--	10.820A	--	1443.7W	--	F1 rated 20A	10.820A	48V/27.1A 5Vsb/1A 1300W
90V, 60Hz	--	16.390A	--	1512.0W	--	F1 rated 20A	16.390A	48V/27.1A 5Vsb/1A 1300W
100V, 60Hz	--	14.541A	16	1483.5W	--	F1 rated 20A	14.541A	48V/27.1A 5Vsb/1A 1300W
120V, 60Hz	--	11.964A	16	1455.6W	--	F1 rated 20A	11.964A	48V/27.1A 5Vsb/1A 1300W
132V, 60Hz	--	10.825A	--	1443.9W	--	F1 rated 20A	10.825A	48V/27.1A 5Vsb/1A 1300W
90V, 50Hz	--	16.412A	--	1512.8W	--	F1 rated 20A	16.412A	48V/27.1A 5Vsb/1A 1300W
100V, 50Hz	--	14.591A	16	1486.0W	--	F1 rated 20A	14.591A	48V/27.1A 5Vsb/1A 1300W
120V, 50Hz	--	12.029A	16	1459.1W	--	F1 rated 20A	12.029A	48V/27.1A 5Vsb/1A 1300W
132V, 50Hz	--	10.853A	--	1443.9W	--	F1 rated 20A	10.853A	48V/27.1A 5Vsb/1A 1300W
90V, 47Hz	--	16.419A	--	1512.1W	--	F1 rated 20A	16.419A	48V/27.1A 5Vsb/1A 1300W
100V, 47Hz	--	14.601A	16	1485.4W	--	F1 rated 20A	14.601A	48V/27.1A 5Vsb/1A 1300W

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Clause		Requirement + Test				Result - Remark		Verdict	
B.2.5		TABLE: Input test							Pass
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
120V, 47Hz	--	12.048A	16	1459.2W	--	F1 rated 20A	12.048A	48V/27.1A 5Vsb/1A 1300W	
132V, 47Hz	--	10.865A	--	1443.2W	--	F1 rated 20A	10.865A	48V/27.1A 5Vsb/1A 1300W	
Supplementary information:									

B.3	TABLE: Abnormal operating condition tests							Pass
Ambient temperature (°C)								—
Power source for EUT: Manufacturer, model/type, output rating ...								—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
CAR2548FP Stalled fans with full load	Unit run full load with no force air	240	7 minutes	F1 at AC line, F1 at AC neutral	0A	--	--	Unit operate at full load with no airflow for 7 minutes, unit stop working and fuse in EMI board open when T2 reached 151 °C, T3 reached 155 °C, T5 reached 154 °C, T4 reached 111 °C, at 25 °C ambient
CAR2548TN -54V Output Overload Test	-54V output overloaded to 58A when 3.3Vsb/1A	240	4 hrs	F1 at AC line, F1 at AC neutral	12.48A	--	--	T2 = 97°C T3 = 101°C T5 = 111°C at 50°C ambient,

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Clause	Requirement + Test				Result - Remark			Verdict
B.3	TABLE: Abnormal operating condition tests							Pass
Ambient temperature (°C):								—
Power source for EUT: Manufacturer, model/type, output rating ..:								—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
CAR2548TN 3.3Vsb Output Overload Test	3.3Vsb output overloaded to 1.92A when - 54V/46.25 A	240	4 hrs	F1 at AC line, F1 at AC neutr al	11.48A	--	--	T4 = 89°C at 50°C ambient,
CAR2548FP 48V Output Overload Test	48V output overloaded to 58.4A when 3.3Vsb/1A	240	4 hrs	F1 at AC line, F1 at AC neutr al	12.997A	--	--	T2 = 113°C T3 = 99°C T5 = 121°C at 50°C ambient,
CAR2548FP 3.3Vsb Output Overload Test	3.3Vsb output overloaded to 1.8A when 48V/52A	240	4 hrs	F1 at AC line, F1 at AC neutr al	11.535A	--	--	T4 = 90°C at 50°C ambient,
CAR2548TN -54V transformer Winding Overload Test	-54V transforme r Winding overloaded to 57.8A when 3.3Vsb/1A	180	4 hrs	F1 at AC line, F1 at AC neutr al	16.54A	--	--	T2 = 100°C T3 = 105°C T5 = 115°C at 50°C ambient,
CAR2548TN 3.3Vsb transformer Winding Overload Test	3.3Vsb transforme r Winding overloaded to 1.8A when - 54V/46.25 A	180	4 hrs	F1 at AC line, F1 at AC neutr al	15.48A	--	--	T4 = 92°C at 50°C ambient,

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Clause	Requirement + Test	Result - Remark	Verdict

B.3	TABLE: Abnormal operating condition tests							Pass
Ambient temperature (°C)								—
Power source for EUT: Manufacturer, model/type, output rating ..								—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
CAR2548FP 48V transformer Winding Overload Test	48V transformer Winding overloaded to 57.4A when 3.3Vsb/1A	180	4 hrs	F1 at AC line, F1 at AC neutral	17.182A	--	--	T2 = 115°C T3 = 104°C T5 = 125°C at 50°C ambient,
CAR2548FP 3.3Vsb transformer Winding Overload Test	3.3Vsb transformer Winding overloaded to 1.8A when 48V/52A	180	4 hrs	F1 at AC line, F1 at AC neutral	15.528A	--	--	T4 = 96°C at 50°C ambient,
Supplementary information:								
Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column "Abnormal/Fault." Specify if test condition by indicating "Abnormal" then the condition for a Clause B.3 test or "Single Fault" then the condition for Clause B.4. Due to the similar design, abnormal tests conducted on CAR2548FP series also represent tests on CAR2548TN series After each fault test, the power supply was hipot tested with 4300Vdc between primary and secondary, and 3100 Vdc between primary and chassis; no breakdown of insulation. During each abnormal test, cheesecloth and paper tissue were used to placed underneath and over the unit under test; after each abnormal, the cheesecloth and tissue remain intact, no flame, no molten metal. Also during each abnormal, the output did not exceed 42.4 Vpk or 60 Vdc in longer than 0.2 sec. In addition, the 71 Vpk and 120 Vdc limit was not exceeded at any time.								

B.4	TABLE: Fault condition tests							Pass
Ambient temperature (°C)								—
Power source for EUT: Manufacturer, model/type, output rating ..								—
Component No.	Fault Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
CAR2548FP L1 L-N	short	240	1 sec	F1 at AC line, F1 at AC neutral	0A	--	--	Both Fuses open immediately,

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
CAR2548FP BR1 AC to (+)	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Both Fuses open immediately,
CAR2548FP Primary C6	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Fuse in the Main Board open immediately,
CAR2548FP Primary Q4 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Fuse in EMI Board open immediately, Q3, Q4, Q16, Q17 fail .
CAR2548FP Primary Q6 G-S	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0.230A	--	--	All outputs shut down immediately
CAR2548FP Primary C45	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0.244A	--	--	All outputs shut down immediately
CAR2548FP Primary Q22 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Fuse in EMI Board open immediately, Q7, Q8, Q21, Q22 fail
CAR2548FP Primary C81	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Fuse in the Main Board open immediately,

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
CAR2548FP Primary Q7 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Fuse in EMI Board open immediately, Q7, Q8, Q21, Q22 fail.
CAR2548FP Primary Q24 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Fuse in EMI Board open immediately, Q9, Q10, Q23, Q24 fail
CAR2548FP Primary Q23 D-S	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Fuse in EMI Board open immediately, Q9, Q10, Q23, Q24 fail
CAR2548FP Secondary L8	short	240	1 hour	F1 at AC line, F1 at AC neutr al	11.43A	--	--	Unit runs stable. All outputs remain below SELV level. T2: 93 ° C, T3: 90 ° C, T5: 88 ° C, At test ambient 25 ° C.
CAR2548FP CR18	short	240	1 sec	F1 at AC line, F1 at AC neutr al	0A	--	--	Outputs shut down immediately. No output overshoot exceeds ES1 level.
CAR2548FP 48V Output short circuit Test	48V output Short circuit 0.2A when 3.3Vsb/1A	240	4 hr	F1 at AC line, F1 at AC neutr al	0.462A	--	--	T2 = 55°C T3 = 55°C T5 = 56°C at 50°C ambient

IEC 62368-1								
Clause	Requirement + Test				Result - Remark			Verdict
CAR2548FP 3.3Vsb Output short circuit Test	3.3Vsb output Short circuit 2.2A	240	4 hr	F1 at AC line, F1 at AC neutral	0.494A	--	--	T4 = 77°C at 50°C ambient All outputs shut down,
Supplementary information:								
Due to the similar design, abnormal tests conducted on CAR2548FP series also represent tests on CAR2548TN series After each fault test, the power supply was hipot tested with 4300Vdc between primary and secondary, and 3100 Vdc between primary and chassis; no breakdown of insulation. During each abnormal test, cheesecloth and paper tissue were used to placed underneath and over the unit under test; after each abnormal, the cheesecloth and tissue remain intact, no flame, no molten metal. Also during each abnormal, the output did not exceed 42.4 Vpk or 60 Vdc in longer than 0.2 sec. In addition, the 71 Vpk and 120 Vdc limit was not exceeded at any time.								

Annex M	TABLE: Batteries								N/A	
The tests of Annex M are applicable only when appropriate battery data is not available										
Is it possible to install the battery in a reverse polarity position? :										
	Non-rechargeable batteries			Rechargeable batteries						
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging		
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	
Max. (cell) Temperature during fault condition										
Max. (cell) Temperature during direct short condition										
Max. (cell) Temperature during direct short condition										
Test results:									Verdict	
- Chemical leaks										
- Explosion of the battery										
- Emission of flame or expulsion of molten metal										
- Electric strength tests of equipment after completion of tests										
Supplementary information:										

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

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Annex M.4	Table: Additional safeguards for equipment containing secondary lithium batteries					N/A
Battery/Cell No.	Test conditions	Measurements			Observation	
		U	I (A)	Temp (°C)		
	Normal					
	Abnormal					
	Single fault –SC/OC					
Supplementary Information:						
Battery identification	Charging at T _{lowest} (°C)	Observation	Charging at T _{highest} (°C)	Observation		
Supplementary Information:						

Annex Q.1	TABLE: Circuits intended for interconnection with building wiring (LPS)					N/A
Note: Measured UOC (V) with all load circuits disconnected:						
Output Circuit	Components	U _{oc} (V)	I _{sc} (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
Supplementary Information:						
SC=Short circuit, OC=Open circuit						

T.2, T.3, T.4, T.5	TABLE: Steady force test				N/A
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation
Supplementary information:					

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

T.6, T.9	TABLE: Impact tests			N/A
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation
Supplementary information:				

T.7	TABLE: Drop tests			N/A
Part/Location	Material	Thickness (mm)	Drop Height (mm)	Observation
Supplementary information:				

T.8	TABLE: Stress relief test				N/A
Part/Location	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation
Supplementary information:					

Enclosure
National Differences

Australia / New Zealand

EU Group and National Differences

Japan

USA / Canada

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT	
IEC 62368-1 (AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES (Audio/video, information and communication technology equipment)	
Differences according to	AS/NZS 62368.1:2018
Attachment Form No.	AU_NZ_ND_IEC62368_1B
Attachment Originator	JAS-ANZ
Master Attachment	2019-02-04
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	NATIONAL DIFFERENCES	Pass
Appendix ZZ	Variations to IEC 62368-1:2014 (ED. 2.0) for Australia and New Zealand	Pass
ZZ1 Scope	This Appendix lists the normative variations to IEC 62368-1:2014 (ED. 2.0)	Pass
ZZ2 Variations	The following modifications are required for Australian/New Zealand conditions:	Pass
2	Add the following to the list of normative references: The following normative documents are referenced in Appendix ZZ: -AS/NZS 3112, <i>Approval and test specification—Plugs and socket-outlets</i> -AS/NZS 3123, <i>Approval and test specification—Plugs, socket-outlets and couplers for general industrial application</i> -AS/NZS 3191, <i>Electric flexible cords</i> -AS/NZS 60065, <i>Audio, video and similar electronic apparatus—Safety requirements (IEC 60065:2015 (ED.8.0) MOD)</i> -AS/NZS 60320.1, <i>Appliance couplers for household and similar general purposes, Part 1: General requirements (IEC 60320-1, Ed.2.1 (2007) MOD)</i> -AS/NZS 60320.2.2, <i>Appliance couplers for household and similar general purposes Part 2.2: Interconnection couplers for household and similar equipment (IEC 60320-2-2, Ed.2.0 (1998) MOD)</i> -AS/NZS 60695.2.11, <i>Fire hazard testing, Part 2.11: Glowing/hot wire based test methods—Glow-wire flammability test method for end-products</i> -AS/NZS 60695.11.5, <i>Fire hazard testing, Part 11.5: Test flames—Needle-flame test method—</i>	N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<i>Apparatus, confirmatory test arrangement and guidance</i> -AS/NZS 60695.11.10, <i>Fire hazard testing, Part 11.10: Test flames—50 W horizontal and vertical flame test methods</i> -AS/NZS 60884.1, <i>Plugs and socket-outlets for household and similar purposes, Part 1: General requirements</i> -AS/NZS 60950.1:2015, <i>Information technology equipment—Safety, Part 1: General requirements (IEC 60950-1, Ed.2.2 (2013), MOD)</i> IEC 61032:1997, <i>Protection of persons and equipment by enclosures—Probes for verification</i> -AS/NZS 61558.1:2008 (including Amendment 2:2015), <i>Safety of Power Transformers, Power Supplies, Reactors and Similar Products, Part 1: General requirements and tests (IEC 61558-1 Ed 2.1, MOD)</i> -AS/NZS 61558.2.16, <i>Safety of transformers, reactors, power supply units and similar products for voltages up to 1 100 V, Part 2.16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units.</i>		
4.1.1	Application of requirements and acceptance of materials, components and subassemblies 1 Replace the text 'IEC 60950-1' with 'AS/NZS 60950.1:2015'. 2 Replace the text 'IEC 60065' with 'AS/NZS 60065'.		N/A
4.7	Equipment for direct insertion into mains socket-outlets		N/A
4.7.2	Requirements Delete the text of the second paragraph and replace with the following: Equipment with a plug portion, suitable for insertion into a 10 A 3-pin flat-pin socket-outlet complying with AS/NZS 3112 shall comply with the requirements in AS/NZS 3112 for equipment with integral pins for insertion into socket-outlets.		N/A
4.7.3	Compliance Criteria Delete the first paragraph and Note 1 and Note 2 and replace with the following: Compliance is checked by inspection and, if necessary, by the tests in AS/NZS 3112.		N/A

IEC62368_1B - ATTACHMENT																							
Clause	Requirement + Test		Result - Remark	Verdict																			
4.8	Delete existing clause title and replace with the following: 4.8 Products containing coin/button cell batteries			N/A																			
4.8.1	General 1 Second dashed point, delete the text and replace with the following: – include coin/button cell batteries with a diameter of 32 mm or less. 2 After the second dashed point, insert the following Note: NOTE 1: Batteries are specified in IEC 60086-2. 3 After the third dashed point, renumber the existing Note as 'NOTE 2'. 4 Fifth dashed point, delete the word 'lithium'.			N/A																			
4.8.2	Instructional Safeguard First line, delete the word 'lithium'.			N/A																			
4.8.3	Construction First line, after the word 'Equipment' insert the words 'containing one or more coin/button batteries and'			N/A																			
4.8.5	Compliance criteria Delete the first paragraph and replace with the following: Compliance is checked by applying a force of 30 N +/-1 N for 10 s to the battery compartment door/cover by a rigid test finger according to test probe 11 of IEC 61032:1997 at the most unfavourable place and in the most unfavourable direction. The force shall be applied in one direction at a time.			N/A																			
5.4.10.2	Test Methods			N/A																			
5.4.10.2.1	General Delete the first paragraph and replace with the following: In Australia only, the separation is checked by the test of both Clause 5.4.10.2.2 and Clause 5.4.10.2.3. In New Zealand, the separation is checked by the test of either Clause 5.4.10.2.2 or Clause 5.4.10.2.3.			N/A																			
Table 29	Replace the table with the following: <table><tr><th rowspan="2">Parts</th><th colspan="2">Impulse test</th><th colspan="2">Steady state test</th></tr><tr><th>New Zealand</th><th>Australia</th><th>New Zealand</th><th>Australia</th></tr><tr><td>Parts indicated in Clause 5.4.10.1 a) ^a</td><td>2.5 kV 10/700 µs</td><td>7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment. 10/700 µs</td><td>1.5 kV</td><td>3 kV</td></tr><tr><td>Parts indicated in Clause 5.4.10.1 b) and c) ^b</td><td colspan="2">1.5 kV 10/700 µs ^c</td><td>1.0 kV</td><td>1.5 kV</td></tr></table> ^a Surge suppressors shall not be removed. ^b Surge suppressors may be removed, provided that such devices pass the impulse test of Clause 5.4.10.2.2 when tested as components outside the equipment. ^c During this test, it is allowed for a surge suppressor to operate and for a sparkover to occur in a GDT.			Parts	Impulse test		Steady state test		New Zealand	Australia	New Zealand	Australia	Parts indicated in Clause 5.4.10.1 a) ^a	2.5 kV 10/700 µs	7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment. 10/700 µs	1.5 kV	3 kV	Parts indicated in Clause 5.4.10.1 b) and c) ^b	1.5 kV 10/700 µs ^c		1.0 kV	1.5 kV	N/A
Parts	Impulse test		Steady state test																				
	New Zealand	Australia	New Zealand	Australia																			
Parts indicated in Clause 5.4.10.1 a) ^a	2.5 kV 10/700 µs	7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment. 10/700 µs	1.5 kV	3 kV																			
Parts indicated in Clause 5.4.10.1 b) and c) ^b	1.5 kV 10/700 µs ^c		1.0 kV	1.5 kV																			

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.10.2.2	After the first paragraph, <i>insert</i> new Notes 201 and 202 as follows: NOTE 201 For Australia, the 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines. NOTE 202 For Australia, the value of 2.5 kV for Clause 5.4.10.1 a) was chosen to ensure the adequacy of the insulation concerned and does not necessarily simulate likely overvoltages.		N/A
5.4.10.2.3	After the first paragraph, <i>insert</i> new Notes 201 and 202 as follows: NOTE 201 For Australia, where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used. NOTE 202 The 3 kV and 1.5 kV values for Australia have been determined considering the low frequency induced voltages from the power supply distribution system.		N/A
6	Electrically-caused fire		N/A
6.1	General After the first paragraph, <i>insert</i> the following new paragraph: Alternatively, the requirements of Clauses 6.2 to 6.5.2 are considered to be fulfilled if the equipment complies with the requirements of Clause 6.202		N/A
6.6	After Clause 6.6, add the new Clauses 6.201 and 6.202 as follows: 6.201 External power supplies, docking stations and other similar devices and 6.202 Resistance to fire—Alternative tests (see special national conditions)		N/A
8.5.4	Special categories of equipment comprising moving parts		N/A
8.5.4.1	Large data storage equipment In the first dashed row and the second dashed rows replace 'IEC 60950-1:2005' with 'AS/NZS 60950.1:2015'.		N/A
8.6	Stability of equipment		N/A
8.6.1 and Table 36	Requirements 1. Table 36, <i>insert</i> Footnote c at the end of the 'Glass slide' heading, and add a new Footnote c after the text of Footnote b in the last row of Table 36 as follows: c The glass slide test is not applicable to floor standing equipment, even though the equipment may have controls or a display.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	2. Table 36, fifth row, <i>insert</i> '201' at the end of 'No stability requirements' 3. Table 36, ninth row, <i>insert</i> '201' at the end of 'No stability requirements' 4. Table 36, add the following new footnote: 201 MS2 and MS3 television sets and display devices, designed only for fixing to a wall, ceiling or equipment rack, are not subjected to stability requirements only if the instructional safeguard of Clause 8.6.1.201 is provided. Otherwise, the glass slide requirements of Clause 8.6.4 and horizontal force requirements of Clause 8.6.5 apply. 5. Second paragraph beneath Table 36, delete the words 'MS2 and MS3 television sets' and replace with 'MS2 and MS3 television sets and display devices'		
8.6.1	After Clause 8.6.1 <i>add</i> the following new clauses: 8.6.1.201 Instructional safeguard for fixed-mount television sets (see special national conditions)		N/A
Annex F Paragraph F.3.5.1	Mains appliance outlet and socket-outlet markings <i>Replace</i> 'IEC 60320-2-2' with 'AS/NZS 60320.2.2'.		N/A
Annex G Paragraph G.4.2	Mains connectors 1 In the second line <i>insert</i> 'or AS/NZS 3123' after 'IEC 60906-1'. 2 In the second line <i>insert</i> 'or AS/NZS 60320 series' after 'IEC 60320 series' 3 <i>Add</i> the following new paragraph: 10 A or 15 A 250 V flat pin plugs for the connection of equipment to mains-powered socket-outlets for household or similar general use shall comply with AS/NZS 3112 or AS/NZS 60884.1.		N/A
Paragraph G.5.3.1	Transformers, General 1 In the third dashed point replace 'IEC 61558-1 and the relevant parts of IEC 61558-2' with 'AS/NZS 61558-1 and the relevant parts of AS/NZS 61558.2' 2 In the fourth dashed point <i>replace</i> 'IEC 61558-2-16' with 'AS/NZS 61558.2.16'.		N/A
Paragraph G.7.1	Mains supply cords, General In the fourth dashed paragraph, <i>replace</i> 'IEC 60320-1' with 'AS/NZS 60320.1'		N/A
Table G.5	Sizes of conductors		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	1 In the second row, first column, <i>delete</i> '6' and <i>replace</i> with '7.5' 2 In the second row, second column, <i>delete</i> '0,75' and <i>replace</i> with '0.75^b' 3 <i>Delete</i> Note 1. 4 <i>Replace</i> 'NOTE 2' with 'NOTE:'. 5 <i>Delete</i> the text of 'Footnote b' and <i>replace</i> with the following: ^b This nominal cross-sectional area is only allowed for Class II appliances if the length of the power supply cord, measured between the point where the cord, or cord guard, enters the appliance, and the entry to the plug does not exceed 2 m (0.5 mm² three-core supply flexible cords are not permitted; see AS/NZS 3191). 6 In Footnote c <i>replace</i> 'IEC 60320-1' with 'AS/NZS 60320.1' 7 In Footnote d <i>replace</i> 'IEC 60320-1' with 'AS/NZS 60320.1'		
Annex M Paragraph M.3.2	Protection circuits for batteries provided within the equipment, Test method After the first dashed point add the following Note: NOTE 201: In cases where the voltage source is provided by power from an unassociated power source, consideration should be given to the effects of possible single fault conditions in the unassociated equipment. If the power source is unknown then it should be assumed that the maximum limit of SELV may be applied to the source input under assumed single fault conditions in the source when assessing the charging circuit in the equipment under test.		N/A
	Special national conditions (if any)		Pass
6.201	External power supplies, docking stations and other similar devices For external power supplies, docking stations and other similar devices, during and after abnormal operating conditions and during single fault conditions the output voltage— – at all ES1 outlets or connectors shall not increase by more than 10% of its rated output voltage under normal operating condition; and – of a USB outlet or connector shall not increase by more than 3 V or 10% of its rated output voltage under normal operating conditions, whichever is higher.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	For equipment with multiple rated output voltages, the requirements apply with the equipment configured for each rated output voltage in turn. NOTE: This is intended to reduce the possibility of battery fire or explosion in attached equipment or accessories when charging secondary lithium batteries. Compliance shall be checked by measurement, taking into account the abnormal operating conditions of Annex B.3 and the simulated single-fault conditions of Annex B.4		
6.202	Resistance to fire - Alternative tests		N/A
6.202.1	General Parts of non-metallic material shall be resistant to ignition and spread of fire. This requirement does not apply to decorative trims, knobs and other parts unlikely to be ignited or to propagate flames from inside the equipment, or the following: a) Components that are contained in an enclosure having a flammability category of V-0 according to AS/NZS 60695.11.10 and having openings only for the connecting wires filling the openings completely, and for ventilation not exceeding 1 mm in width regardless of length. b) The following parts which would contribute negligible fuel to a fire: – small mechanical parts, the mass of which does not exceed 4 g, such as mounting parts, gears, cams, belts and bearings; – small electrical components, such as capacitors with a volume not exceeding 1 750 mm³, integrated circuits, transistors and optocoupler packages, if these components are mounted on material of flammability category V-1, or better, according to AS/NZS 60695.11.10. NOTE: In considering how to minimize propagation of fire and what 'small parts' are, account should be taken of the cumulative effect of small parts adjacent to each other for the possible effect of propagating the fire from one part to another. <i>Compliance shall be checked by the tests of Clauses 6.202.2, 6.202.3 and 6.202.4.</i> For the base material of printed boards, compliance shall be checked by the test of Clause 6.202.5.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	The tests shall be carried out on parts of non-metallic material which have been removed from the equipment. When the glow-wire test is carried out, the parts shall be placed in the same orientation as they would be in normal use. These tests are not carried out on internal wiring.		
6.202.2	Testing of non-metallic materials Parts of non-metallic material shall be subject to the glow-wire test of AS/NZS 60695.2.11 which shall be carried out at 550°C. Parts for which the glow-wire test cannot be carried out, such as those made of soft or foamy material, shall meet the requirements specified in ISO 9772 for category FH-3 material. The glow-wire test shall be not carried out on parts of material classified at least FH-3 according to ISO 9772 provided that the relevant part is not thinner than the sample tested.		N/A
6.202.3	Testing of insulating materials Parts of insulating material supporting Potential Ignition Sources shall be subject to the glow-wire test of AS/NZS 60695.2.11 which shall be carried out at 750°C. The test shall be also carried out on other parts of insulating material which are within a distance of 3 mm of the connection. NOTE: Contacts in components such as switch contacts are considered to be connections		N/A
	For parts which withstand the glow-wire test but produce a flame, other parts above the connection within the envelope of a vertical cylinder having a diameter of 20 mm and a height of 50 mm shall be subjected to the needle-flame test. However, parts shielded by a barrier which meets the needle-flame test need not be tested		N/A
	The needle-flame test shall be made in accordance with AS/NZS 60695.11.5 with the following modifications		N/A

IEC62368_1B - ATTACHMENT													
Clause	Requirement + Test		Result - Remark	Verdict									
	<table><tr><td>Clause of AS/NZS 60695.11.5</td><td>Change</td></tr><tr><td>9 Test procedure</td><td></td></tr><tr><td>9.2 Application of needle-flame</td><td>Delete the first and second paragraphs and replace with the following: The specimen shall be arranged so that the flame can be applied to a vertical or horizontal edge as shown in the examples of Figure 1. If possible the flame shall be applied at least 10 mm from a corner. The duration of application of the test flame shall be 30 s +1 s.</td></tr><tr><td>9.3 Number of test specimens</td><td>Replace with the following: The test shall be made on one specimen. If the specimen does not withstand the test, the test may be repeated on two further specimens, both of which shall withstand the test.</td></tr><tr><td>11 Evaluation of test results</td><td>Replace with the following: The duration of burning (tb) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15 s.</td></tr></table> The needle-flame test shall not be carried out on parts of material classified as V-0 or V-1 according to AS/NZS 60695.11.10, provided that the relevant part is not thinner than the sample tested.	Clause of AS/NZS 60695.11.5	Change	9 Test procedure		9.2 Application of needle-flame	Delete the first and second paragraphs and replace with the following: The specimen shall be arranged so that the flame can be applied to a vertical or horizontal edge as shown in the examples of Figure 1. If possible the flame shall be applied at least 10 mm from a corner. The duration of application of the test flame shall be 30 s +1 s.	9.3 Number of test specimens	Replace with the following: The test shall be made on one specimen. If the specimen does not withstand the test, the test may be repeated on two further specimens, both of which shall withstand the test.	11 Evaluation of test results	Replace with the following: The duration of burning (tb) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15 s.		
Clause of AS/NZS 60695.11.5	Change												
9 Test procedure													
9.2 Application of needle-flame	Delete the first and second paragraphs and replace with the following: The specimen shall be arranged so that the flame can be applied to a vertical or horizontal edge as shown in the examples of Figure 1. If possible the flame shall be applied at least 10 mm from a corner. The duration of application of the test flame shall be 30 s +1 s.												
9.3 Number of test specimens	Replace with the following: The test shall be made on one specimen. If the specimen does not withstand the test, the test may be repeated on two further specimens, both of which shall withstand the test.												
11 Evaluation of test results	Replace with the following: The duration of burning (tb) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15 s.												
6.202.4	Testing in the event of non-extinguishing material If parts, other than enclosures, do not withstand the glow wire tests of Clause 6.202.3, by failure to extinguish within 30 s after the removal of the glow wire tip, the needle-flame test detailed in Clause 6.202.3 shall be made on all parts of non-metallic material which are within a distance of 50 mm or which are likely to be impinged upon by flame during the tests of Clause 6.202.3. Parts shielded by a separate barrier which meets the needle-flame test need not be tested. NOTE 1: If the enclosure does not withstand the glow-wire test the equipment is considered to have failed to meet the requirements of Clause 6.202 without the need for consequential testing. NOTE 2: If other parts do not withstand the glow-wire test due to ignition of the tissue paper and if this indicates that burning or glowing particles can fall onto an external surface underneath the equipment, the equipment is considered to have failed to meet the requirements of Clause 6.202 without the need for consequential testing. NOTE 3: Parts likely to be impinged upon by the flame are considered to be those within the envelope of a vertical cylinder having a radius of 10 mm and a height equal to the height of the flame, positioned above the point of the material supporting, in contact with, or in close proximity to, connections.			N/A									
6.202.5	Testing of printed boards The base material of printed boards shall be subjected to the needle-flame test of Clause			N/A									

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	6.202.3. The flame shall be applied to the edge of the board where the heat sink effect is lowest when the board is positioned as in normal use. The flame shall not be applied to an edge, consisting of broken perforations, unless the edge is less than 3 mm from a potential ignition source. The test is not carried out if— – the printed board does not carry any potential ignition source; – the base material of printed boards, on which the available apparent power at a connection exceeds 15 VA operating at a voltage exceeding 50 V and equal or less than 400 V (peak) a.c. or d.c. under normal operating conditions, is of flammability category V-1 or better according to AS/NZS 60695.11.10, or the printed boards are protected by an enclosure meeting the flammability category V-0 according to AS/NZS 60695.11.10, or made of metal, having openings only for connecting wires which fill the openings completely; or – the base material of printed boards, on which the available equipment power at a connection exceeds 15 VA operating at a voltage exceeding 400 V (peak) a.c. or d.c. under normal operating conditions, and base material of printed boards supporting spark gaps which provides protection against overvoltages, is of flammability category V-0 according to AS/NZS 60695.11.10 or the printed boards are contained in a metal enclosure, having openings only for connecting wires which fill the openings completely. <i>Conformance</i> shall be determined using the smallest thickness of the material. NOTE: Available apparent power is the maximum apparent power which can be drawn from the supplying circuit through a resistive load whose value is chosen to maximize the apparent power for more than 2 min when the circuit supplied is disconnected.		
6.202.6	For open circuit voltages greater than 4 kV Potential ignition sources with open circuit voltages exceeding 4 kV (peak) a.c. or d.c. under normal operating conditions shall be contained in a FIRE ENCLOSURE which shall comply with flammability category V-1 or better according to AS/NZS 60695.11.10.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
8.6.1.201	8.6.1.201 Instructional safeguard for fixed-mount television sets MS2 and MS3 television sets and display devices designed only for fixed mounting to a wall or ceiling or equipment rack shall, where required in Table 36, footnote 201, have an instructional safeguard in accordance with Clause F.5 which may be on the equipment or included in the installation instructions or equivalent document accompanying the equipment. The elements of the instructional safeguard shall be as follows: – element 1a: not available; – element 2: 'Stability Hazard' or equivalent wording; – element 3: 'The television set may fall, causing serious personal injury or death' or equivalent text; – element 4: the following or equivalent text: To prevent injury, this television set must be securely attached to the floor/wall in accordance with the installation instructions		N/A
8.6.1.202	Restraining device MS2 and MS3 television sets and display devices that are not solely fixed-mounted should be provided with a restraining device such as a fixing point to facilitate restraining the equipment from toppling forward. The restraining device shall be capable of withstanding a pull of 100 N in all directions without damage. Where a restraining device is provided, instructions shall be provided in the instructions for installation or instructions for use to ensure correct and safe installation.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT	
IEC 62368-1	
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES	
(Audio/video, information and communication technology equipment - Part 1: Safety requirements)	
Differences according to	EN 62368-1:2014+A11:2017
Attachment Form No.	EU_GD_IEC62368_1B_II
Attachment Originator	Nemko AS
Master Attachment	9/22/2017
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	CENELEC COMMON MODIFICATIONS (EN)				Pass																																				
	Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed “Z”.				Pass																																				
CONTENT S	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords				Pass																																				
	Delete all the “country” notes in the reference document (IEC 62368-1:2014) according to the following list: <table> <tr> <td>0.2.1</td> <td>Note</td> <td>1</td> <td>Note 3</td> <td>4.1.15</td> <td>Note</td> </tr> <tr> <td>4.7.3</td> <td>Note 1 and 2</td> <td>5.2.2.2</td> <td>Note</td> <td>5.4.2.3.2.2 Table 13</td> <td>Note c</td> </tr> <tr> <td>5.4.2.3.2.4</td> <td>Note 1 and 3</td> <td>5.4.2.5</td> <td>Note 2</td> <td>5.4.5.1</td> <td>Note</td> </tr> <tr> <td>5.5.2.1</td> <td>Note</td> <td>5.5.6</td> <td>Note</td> <td>5.6.4.2.1</td> <td>Note 2 and 3</td> </tr> <tr> <td>5.7.5</td> <td>Note</td> <td>5.7.6.1</td> <td>Note 1 and 2</td> <td>10.2.1 Table 39</td> <td>Note 2, 3 and 4</td> </tr> <tr> <td>10.5.3</td> <td>Note 2</td> <td>10.6.2.1</td> <td>Note 3</td> <td>F.3.3.6</td> <td>Note 3</td> </tr> </table>				0.2.1	Note	1	Note 3	4.1.15	Note	4.7.3	Note 1 and 2	5.2.2.2	Note	5.4.2.3.2.2 Table 13	Note c	5.4.2.3.2.4	Note 1 and 3	5.4.2.5	Note 2	5.4.5.1	Note	5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3	5.7.5	Note	5.7.6.1	Note 1 and 2	10.2.1 Table 39	Note 2, 3 and 4	10.5.3	Note 2	10.6.2.1	Note 3	F.3.3.6	Note 3	Pass
0.2.1	Note	1	Note 3	4.1.15	Note																																				
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5.7.5	Note	5.7.6.1	Note 1 and 2	10.2.1 Table 39	Note 2, 3 and 4																																				
10.5.3	Note 2	10.6.2.1	Note 3	F.3.3.6	Note 3																																				
	For special national conditions, see Annex ZB.				Pass																																				
1	Add the following note: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.				N/A																																				
4.Z1	Protective devices included as integral parts of the equipment or as parts of the building installation:				N/A																																				
	a) Included as parts of the equipment				N/A																																				
	b) For components in series with the mains; by devices in the building installation				N/A																																				
	c) For pluggable type B or permanently connected: by devices in the building installation				N/A																																				

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.2.3.2.4	Add the following to the end of this subclause: The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.		N/A
10.2.1	Add the following to c) and d) in table 39: For additional requirements, see 10.5.1.		N/A
10.5.1	Add the following after the first paragraph: For RS 1 compliance is checked by measurement under the following conditions: In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or presets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made. NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm ² , at any point 10 cm from the outer surface of the apparatus. Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made. For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level. NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.		N/A
10.6.1	Add the following paragraph to the end of the subclause: EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.		N/A
10.Z1	Add the following new subclause after 10.6.5. 10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body-mounted devices, attention is drawn to EN 50360 and EN 50566		N/A
G.7.1	Add the following note: NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Bibliography	Add the following standards: Add the following notes for the standards indicated: IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.		Pass
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		N/A
4.1.15	Denmark, Finland, Norway and Sweden To the end of the subclause the following is added: Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord." In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"		N/A
4.7.3	United Kingdom To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex		N/A
5.2.2.2	Denmark After the 2nd paragraph add the following: A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.11.1 and Annex G	Finland and Sweden To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		N/A
5.5.2.1	Norway After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.6	Finland, Norway and Sweden To the end of the subclause the following is added: Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2.		N/A
5.6.1	Denmark Add to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. <i>Justification:</i> In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.		N/A
5.6.4.2.1	Ireland and United Kingdom After the indent for pluggable equipment type A , the following is added: – the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.		N/A
5.6.5.1	Ireland and United Kingdom To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm ² to 1,5 mm ² in cross-sectional area.		N/A
5.7.5	Denmark To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A
5.7.6.1	Norway and Sweden To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Apparatus connected to the protective earthing		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)" NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): "Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet." Translation to Swedish: "Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet."		
5.7.6.2	Denmark To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .		N/A
B.3.1 and B.4	Ireland and United Kingdom The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4 are met		N/A
G.4.2	Denmark: Appliances rated ≤13 A provided with a plug according to DS 60884-2-D1:2011.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Class I equipment provided with socket-outlets provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having rated >13 A or poly-phase equipment provided with a supply cord with a plug, plug in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. Mains socket outlets intended for providing power to Class II apparatus rated 2,5 A in accordance with DS 60884-2-D1:2011 standard sheet DKA 1-4a. Other current rating socket outlets in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. Mains socket-outlets with earth in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a		
G.4.2	United Kingdom To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
G.7.1	United Kingdom To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
G.7.1	Ireland To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.2	Ireland and United Kingdom To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm ² is allowed for equipment which is rated over 10 A and up to and including 13 A.		N/A
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A
10.5.2	Germany The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. <i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int +49-531-592-6320, Internet: http://www.ptb.de		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62368-1 (JAPAN) NATIONAL DIFFERENCES (Audio/video, information and communication technology equipment – Part 1: Safety requirements)	
Differences according to	J62368-1 (H30)
Attachment Form No.....	JP_ND_IEC62368_1B
Attachment Originator	UL (JP)
Master Attachment.....	Date 2018-11-22
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	National Differences	—
4.1.2	Where the component, or a characteristic of a component, is a safeguard or a part of a safeguard, components shall comply with the requirements of this standard or, where specified in a requirements clause, with the safety aspects of the relevant JIS component standards or IEC component standards, or components shall have properties equivalent to or better than these.	N/A
5.6.1	Mains socket-outlet and appliance outlet shall comply with Clause G.4.2A if they are incorporated as part of the equipment.	N/A
5.6.2.1	Mains connection of class 0I equipment: Instructional safeguard in accordance with Clause F.3.6.1A; Mains plug having a lead wire for protective earthing connection of class 0I equipment; Independent main protective earthing terminal installed by ordinary person.	N/A
5.6.2.2	This requirement does not apply to internal conductor of the cord set that is covered by the sheath of mains cord and is formed together with mains plug and appliance connector.	N/A
5.6.3	In case of class 0I equipment using power supply cord having two conductors (no earthing conductor), the conductor of protective earthing lead wire shall comply with either of the following:	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– use of annealed copper wire with 1.6 mm diameter or corrosion-inhibiting metal wire having size and strength that are equivalent to or more than the above copper wire – single core cord or single core cab tire cable with 1.25 mm² or more cross-sectional area		
5.7.3	For class 0I equipment that is provided with mains socket-outlet in the configuration as specified in JIS C 8282 series or JIS C 8303, or otherwise being considered to comply with relevant regulations, or that is provided with mains appliance outlet as specified in JIS C 8283-2-2 for the purpose of interconnection, the measurement is conducted on the system of the interconnected equipment having a single connection to the mains.		N/A
5.7.4	In case of class 0I equipment, touch current shall not exceed 1.41 mA peak or for sinusoidal wave, 1.0 mA r.m.s. when measured using the network specified in Figure 4 of IEC 60990.		N/A
6.4.3.3	A fuse complying with JIS C 6575 series or a fuse having equivalent characteristics shall open within 1 s. For Class A fuse of JIS C 6575, replace “2.1 times” by “1.35 times” and in case of Class B fuse of JIS C 6575, replace “2.1 times” by “1.6 times”. A fuse not complying with JIS C 6575 series shall be tested with the breaking capacity taken into account.		N/A
8.5.4.2.1	Only three-phase stationary equipment rated more than 200 V ac can be considered as being for use in locations where children are not likely to be present, when complying with Clause F.4.		N/A
8.5.4.2.2	For equipment installed where children may be present, an instructional safeguard shall be provided by easily understandable wording in accordance with Clause F.5, except that element 3 is optional.		N/A
8.5.4.2.4	The media destruction device is tested according to Clause V.1.2 with applicable jointed test probes		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	to the opening. And then the wedge probe per Figure V.4 shall not contact any moving part.		
8.5.4.2.5	The wedge probe of Figure V.4 and applicable jointed test probes specified in Clause V.1.2 shall not contact any moving part. Instructional safeguard shall not be used instead of equipment safeguard for preventing access to hazardous moving parts.		N/A
9.2.6, Table 38	Handles, Knobs, grips, etc. and external surfaces either held, touched or worn against the body in normal use (> 1 min) ^{b,c}		N/A
F.3.5.1	Instructional safeguard of class 0I equipment in accordance with Clause F.5 when a mains socket-outlet as specified in JIS C 8282 series, JIS C 8303 or relevant regulation to which class I equipment can be connected is provided in accordance with Clause G.4.2A except for the cases where the socket-outlet is accessible only to skilled persons.		N/A
F.3.5.3	If the fuse is necessary for the safeguard function, the symbols indicating pre-arcing time-current characteristic.		N/A
F.3.6.1A	Marking for class 0I equipment The requirements of Clauses F.3.6.1.1 and F.3.6.1.3 shall be applied to class 0I equipment. For class 0I equipment, a marking of instructions and instructional safeguard shall be provided regarding the earthing connection.		N/A
F.3.6.2.1	Symbols, IEC 60417-5172 (2003-02) or IEC 60417-6092 (2011-10), shall not be used for class I equipment or class 0I equipment.		N/A
F.4	Instruction for audio equipment with terminals classified as ES3 in accordance with Table E.1, and for other equipment with terminals marked in accordance with F.3.6.1 and F.3.6.1A. Installation instruction for the protective earthing connection for class 0I equipment provided with independent main protective earthing terminal, where the cord for the protective earthing		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	connection is not provided within the package for the equipment.		
G.3.2.1	The thermal link when tested as a separate component, shall comply with the requirements of JIS C 6691 or have properties equivalent to or better than that.		N/A
G.3.4	Except for devices covered by Clause G.3.5, overcurrent protective devices used as a safeguard shall comply with the relevant part of JIS C 6575 (corresponding to IEC60127) or shall have equivalent characteristics. If there are no applicable IEC standards, overcurrent protective devices used as a safeguard shall comply with their applicable IEC standards.		N/A
G.4.1	This requirement is not applicable to Clauses G.4.2 and G.4.2A.		N/A
G.4.2	Mains connector shall comply with JIS C 8282 series, JIS C 8283 series, JIS C 8285, JIS C 8303 or IEC 60309 series. Mains plugs and socket-outlets shall comply with JIS C 8282 series, JIS C 8303, IEC 60309 series, or have equivalent or better performance. A power supply cord set provided with appliance connector that can fit appliance inlet complying with JIS C 8283-1 shall comply with JIS C 8286. Construction preventing mechanical stress not to transmit to the soldering part of inlet terminal. Consideration for an equipment rated not more than 125 V provided with Type C14 and C18 appliance coupler complying with JIS C 8283 series.		N/A
G.4.2A	Mains socket-outlet and interconnection coupler provided with the class II, class I and class 0I equipment respectively.		N/A
G.7.1	A mains supply cord need not include the protective earthing conductor for class 0I		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	equipment provided with independent protective earthing conductor.		
G.8.3.3	Withstand $1,71 \times 1.1 \times U_0$ for 5 s.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62368-1 2th Ed. U.S.A. NATIONAL DIFFERENCES Audio/video, information and communication technology equipment – Part 1: Safety requirements	
Differences according to	CSA/UL 62368-1:2014
Attachment Form No.	US&CA_ND_IEC623681B
Attachment Originator	UL(US)
Master Attachment	Date 2015-06
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IEC 62368-1 - US and Canadian National Differences Special National Conditions based on Regulations and Other National Differences			
1.1	All equipment is to be designed to allow installation according to the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, for such equipment marked or otherwise identified, installation is allowed per the Standard for the Protection of Information Technology Equipment, ANSI/NFPA 75.	Complies	Pass
1.4	Additional requirements apply to some forms of power distribution equipment, including sub-assemblies.		N/A
4.1.17	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the NEC.		N/A
	For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the NEC generally are required to have special construction features and identification markings.		N/A
4.8	Lithium coin / button cell batteries have modified special construction and performance requirements.		N/A
5.6.3	Protective earthing conductors comply with the minimum conductor sizes in Table G.5, except as required by Table G.7ADV.1 for cord connected equipment, or Annex DVH for permanently connected equipment	To be evaluated in the end product	N/A
5.7.7	Equipment intended to receive telecommunication ringing signals complies with a special touch current measurement tests.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
6.5.1	PS3 wiring outside a fire enclosure complies with single fault testing in B.4, or be current limited per one of the permitted methods.		N/A
Annex F (F.3.3.8)	Output terminals provided for supply of other equipment, except mains, supply are marked with a maximum rating or references to which equipment it is permitted to be connected.		N/A
Annex G (G.7.1)	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.		N/A
Annex G (G.7.3)	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.		N/A
	Flexible power supply cords are required to be compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC.		N/A
Annex G (G.7.5)	Minimum cord length is required to be 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement. Power supply cords are required to be no longer than 4.5 m in length if used in ITE Rooms.		N/A
Annex H.2	Continuous ringing signals under normal operating conditions up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.		N/A
Annex H.4	For circuits with other than ringing signals and with voltages exceeding 42.4 V _{peak} or 60 V d.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.		N/A
Annex M	Battery packs for stationary applications comply with special component requirements.		N/A
Annex DVA (1)	Equipment intended for use in spaces used for environmental air are subjected to special flammability requirements for heat and visible smoke release.		N/A
	For ITE room applications, automated information storage systems with combustible media greater than 0.76 m ³ (27 cu ft) have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.		N/A
	Consumer products designed or intended primarily for children 12 years of age or younger are subject to additional requirements in accordance with U.S. & Canadian Regulations.		N/A

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	Baby monitors additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors.		N/A
Annex DVA (5.6.3)	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.		N/A
Annex DVA (6.3)	The maximum quantity of flammable liquid stored in equipment complies with NFPA 30.		N/A
Annex DVA (6.4.8)	For ITE room applications, enclosures with combustible material measuring greater than 0.9 m ² (10 sq ft) or a single dimension greater than 1.8 m (6 ft) have a flame spread rating of 50 or less. For equipment with the same dimensions for other applications, an external surface that is not a fire enclosure requires a min. flammability classification of V-1.		N/A
Annex DVA (10.3.1)	Equipment with lasers meets the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
Annex DVA (10.5.1)	Equipment that produces ionizing radiation complies with the U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
Annex DVA (F.3.3.3)	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. Additional considerations apply for voltage ratings that exceed the attachment cap rating or are lower than the "Normal Operating Condition" in Table 2 of CAN/CSA C22.2 No. 235."		N/A
Annex DVA (F.3.3.5)	Equipment identified for ITE (computer) room installation is marked with the rated current		N/A
Annex DVA (G.1)	Vertically-mounted disconnect switches and circuit breakers have the "on" position indicated by the handle in the up position		N/A
Annex DVA (G.3.4)	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.		N/A
Annex DVA (G.4.2)	Equipment with isolated ground (earthing) receptacles complies with NEC 250.146(D) and CEC 10-112 and 10-906(8).		N/A
Annex DVA (G.4.3)	Where a fuse is used to provide Class 2 or Class 3 current limiting, it is not operator-accessible unless it is non- interchangeable.		N/A

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Annex DVA (G.5.3)	Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require special transformer overcurrent protection.		N/A
Annex DVA (G.5.4)	Motor control devices are required for cord-connected equipment with a mains-connected motor if the equipment is rated more than 12 A, or if the equipment has a nominal voltage rating greater than 120 V, or if the motor is rated more than 1/3 hp (locked rotor current over 43 A).		N/A
Annex DVA (Annex M)	For ITE room applications, equipment with battery systems capable of supplying 750 VA for five minutes have a battery disconnect means that may be connected to the ITE room remote power-off circuit.		N/A
Annex DVA (Q)	Wiring terminals intended to supply Class 2 outputs according to the NEC or CEC Part 1 are marked with the voltage rating and "Class 2" or equivalent; marking is located adjacent to the terminals and visible during wiring.		N/A
Annex DVB (1)	Additional requirements apply for equipment used for entertainment purposes intended for installation in general patient care areas of health care facilities.		N/A
Annex DVC (1)	Additional requirements apply for equipment intended for mounting under kitchen cabinets.		N/A
Annex DVE (4.1.1)	Some equipment, components, sub-assemblies and materials associated with the risk of fire, electric shock, or personal injury have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. Components required to comply include: appliance couplers, attachment plugs, battery back-up systems, battery packs, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), power supply cords, direct plug-in equipment, electrochemical capacitor modules (energy storage modules with ultra-capacitors), enclosures (outdoor), flexible cords and cables, fuses (branch circuit), ground-fault current interrupters, interconnecting cables, data storage equipment, printed wiring, protectors for communications circuits, receptacles, surge protective devices, vehicle battery adapters, wire connectors, and wire and cables.		N/A
Annex DVH	Equipment for permanent connection to the mains supply is subjected to additional requirements.		N/A

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Annex DVH (DVH.1)	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains are in accordance with the NEC/CEC.		N/A
Annex DVH (DVH.3.2)	Terminals for permanent wiring, including protective earthing terminals, are suitable for U.S./Canadian wire gauge sizes, rated 125 percent of the equipment rating, and are specially marked when specified.		N/A
Annex DVH (DVH.3.2)	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm ²).		N/A
Annex DVH (DVH.4)	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.		N/A
Annex DVH (DVH 5.5)	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, complies with special earthing, wiring, marking and installation instruction requirements.		N/A
Annex DVI (6.7)	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses.		N/A
Annex DVJ (10.6.1)	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.		N/A

Enclosures

Enclosures

Type	Supplement Id	Description
Photographs	03-01	Overall View - Connector Side
Photographs	03-02	Overall View - Fan Side
Photographs	03-03	Internal View 1
Photographs	03-04	Internal View 2
Photographs	03-05	Trace - Main Board
Photographs	03-06	Trace - PFC/Bias Control Board
Diagrams	04-01	Specification of Inductor L1
Diagrams	04-02	Specification of Inductor L2
Diagrams	04-03	Specification of Inductor L3
Diagrams	04-04	Specification of Inductor L4
Diagrams	04-05	Specification of Inductor L5
Diagrams	04-06	Specification of Inductor L6
Diagrams	04-07	Specification of Inductor L7
Diagrams	04-08	Specification of Transformer T2, T3, T5
Diagrams	04-09	Specification of Transformer T4
Diagrams	04-10	Specification of DC fan
Diagrams	04-11	Dimension of metal enclosure
Diagrams	04-12	Dimension of insulation sheet
Schematics + PWB	05-01	PWB layout

Enclosures

Photographs ID 03-01



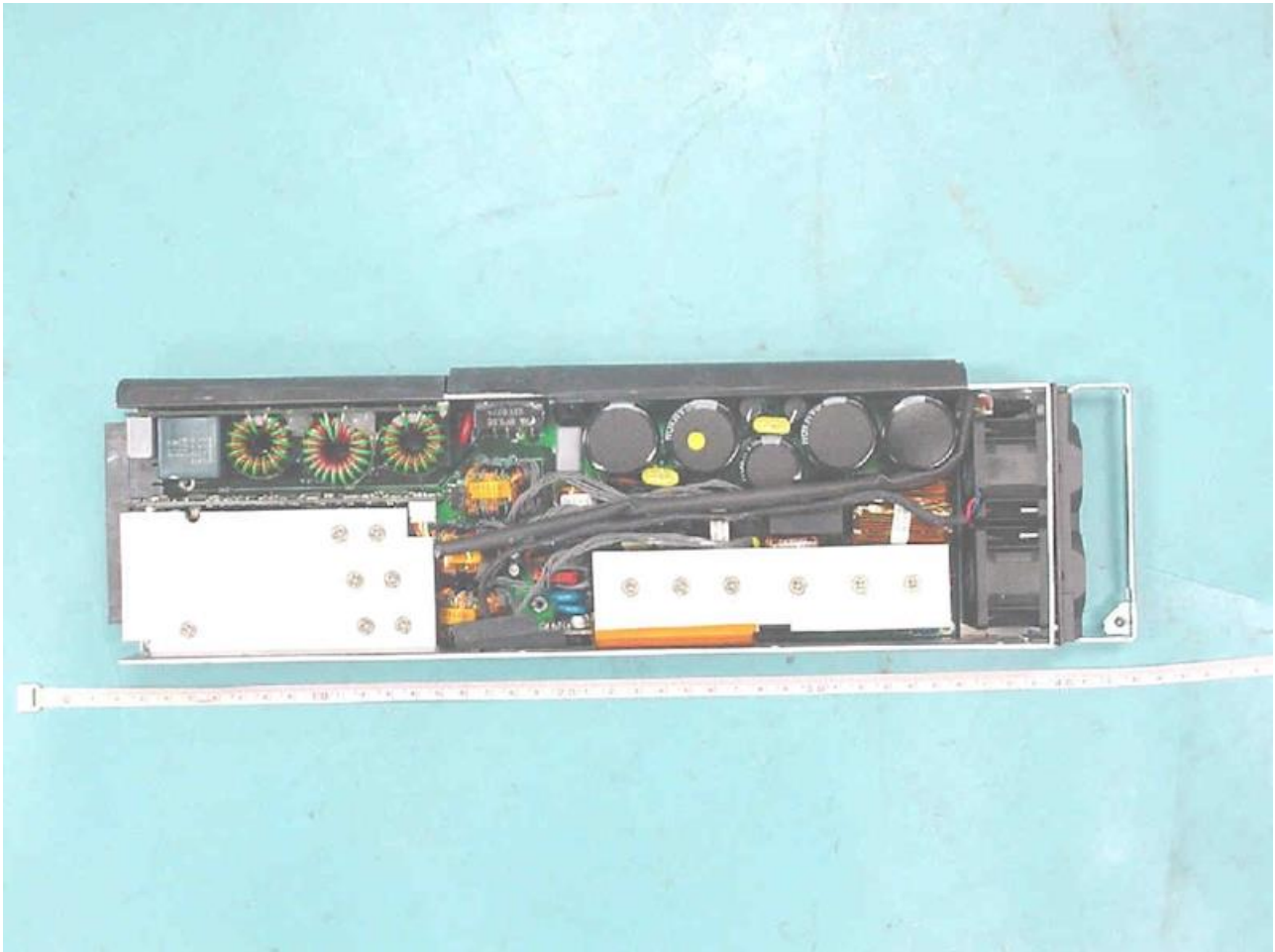
Enclosures

Photographs ID 03-02



Enclosures

Photographs ID 03-03



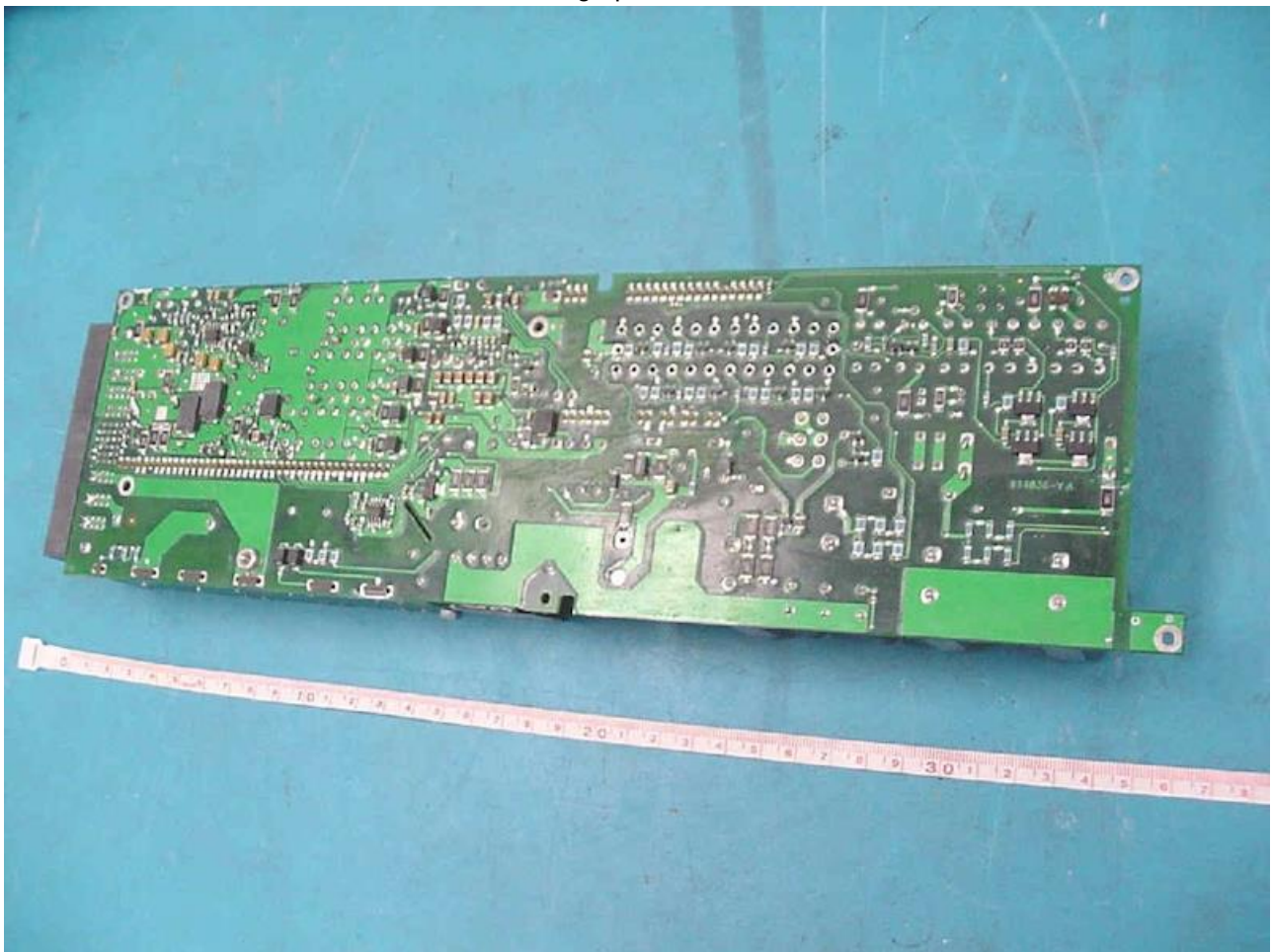
Enclosures

Photographs ID 03-04



Enclosures

Photographs ID 03-05



Enclosures

Photographs ID 03-06

