Ref. Certif. No.

DK-96731-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	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 preparing the Report .....:	UL-CCIC Company Limited 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

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	Victor Liu
Approved by (name + signature) .....:		Jie Qian / Reviewer	Jie Qian

☐	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):	**Testing Location:**
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)	**CBTL: UL-CCIC Company Limited, No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China**

Summary of compliance with National Differences:

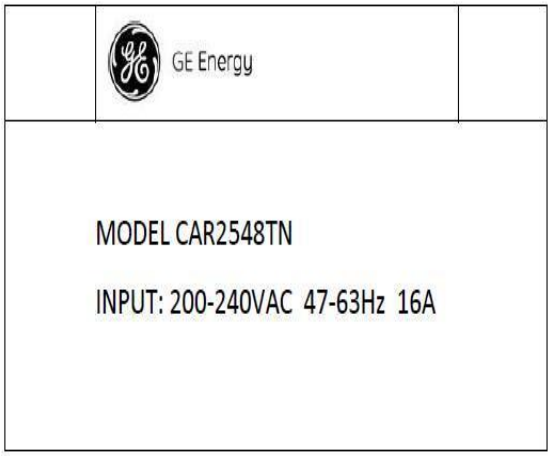
List of countries addressed: Australia / New Zealand, EU Group and National Differences, Japan, USA / Canada

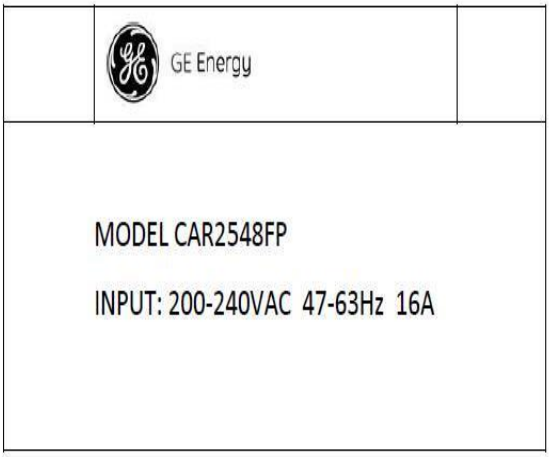
EU Group and National Differences applies to CENELEC member countries: Austria , Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal,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

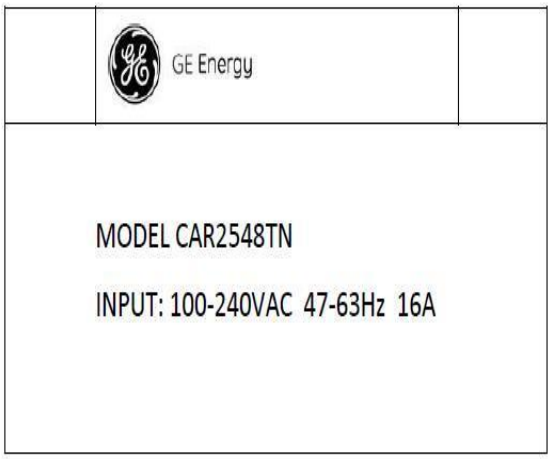
☒ **The product fulfils the requirements of:** EN 62368-1:2014 + A11:2017

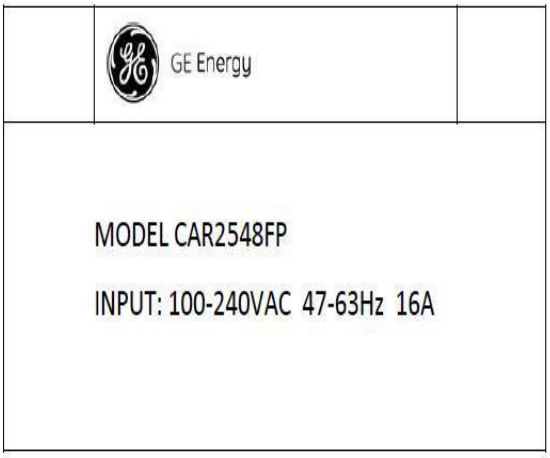
Copy of marking plate:

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 IECEE 02:	
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

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				

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
4.1.15	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

IEC 62368-1			
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	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
5.3.2.1	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	—

IEC 62368-1			
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

IEC 62368-1			
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 *N* ..... :		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

IEC 62368-1			
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 Uc = 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	Ringing signal		N/A
H.3.1.1	Frequency (Hz) .....:		—
H.3.1.2	Voltage (V) .....:		—

IEC 62368-1			
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

IEC 62368-1			
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 EFECTS 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)**	**Comments**

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	—
	Tma (°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/60Hz	180V/50Hz	180V/47Hz	--
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/6 0Hz	264V/5 0Hz	264V/4 7Hz	--
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/6 0Hz	132V/5 0Hz	132V/4 7Hz	--
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/60Hz	264V/50Hz	264V/47Hz	--
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/60Hz At 30 ° C	132V/50Hz At 30 ° C	132V/47Hz 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	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	--
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/trademark	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

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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

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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=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					

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:4.16mApk 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 (Vp)	Measured r.m.s current (Irms)	Calculated value (V_p x 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 (Vp) and normal operating condition rms current (Irms) 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 IA may be used instead of a wattmeter. If a separate voltmeter and ammeter are used, the product of (VA x IA) 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 minu tes	F1 at AC line, F1 at AC neutr al	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 neutr al	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 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/46.25 A	180	4 hrs	F1 at AC line, F1 at AC neutral	15.48A	--	--	T4 = 92°C at 50°C ambient,

IEC 62368-1			
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 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,

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 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, 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

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

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:						

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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, *Approval and test specification—Plugs and socket-outlets* -AS/NZS 3123*, Approval and test specification—Plugs, socket-outlets and couplers for general industrial application* -AS/NZS 3191, *Electric flexible cords* -AS/NZS 60065, *Audio, video and similar electronic apparatus—Safety requirements* *(IEC 60065:2015 (ED.8.0) MOD)* -AS/NZS 60320.1, *Appliance couplers for household and similar general purposes,* *Part 1: General requirements (IEC 60320-1, Ed.2.1 (2007) MOD)* -AS/NZS 60320.2.2, *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)* -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* -AS/NZS 60695.11.5, *Fire hazard testing, Part 11.5: Test flames—Needle-flame test method—*		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Apparatus, confirmatory test arrangement and guidance -AS/NZS 60695.11.10, *Fire hazard testing, Part 11.10: Test flames—50 W* *horizontal and vertical flame test methods* -AS/NZS 60884.1, *Plugs and socket-outlets for household and similar purposes,* *Part 1: General requirements* -AS/NZS 60950.1:2015, *Information technology equipment—Safety, Part 1: General requirements (IEC 60950-1, Ed.2.2 (2013), MOD)* *IEC 61032:1997, Protection of persons and equipment by enclosures—Probes for* *verification* -AS/NZS 61558.1:2008 (including Amendment 2:2015*), Safety of Power Transformers,* *Power Supplies, Reactors and Similar Products, Part 1: General requirements and* *tests (IEC 61558-1 Ed 2.1, MOD)* -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.*		
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:		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

[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.

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.10.2.2	After the first paragraph, *insert* 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, *insert* 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, *insert* 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, *insert* 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

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Clause	Requirement + Test	Result - Remark	Verdict
	2. Table 36, fifth row, *insert* '[201]' at the end of 'No stability requirements' 3. Table 36, ninth row, *insert* '[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 *add* 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** *Replace* '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 *insert* 'or AS/NZS 3123' after 'IEC 60906-1'. 2 In the second line *insert* 'or AS/NZS 60320 series' after 'IEC 60320 series' 3 *Add* 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 *replace* '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, *replace* '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, *delete* '6' and *replace* with '7.5' 2 In the second row, second column, *delete* '0,75' and *replace* with '0.75[b] 3 *Delete* Note 1. 4 *Replace* 'NOTE 2' with 'NOTE:'. 5 *Delete* the text of 'Footnote b' and *replace* 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 *replace* 'IEC 60320-1' with 'AS/NZS 60320.1' 7 In Footnote d *replace* '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. *Compliance shall be checked by the tests of Clauses 6.202.2, 6.202.3 and 6.202.4.* 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.		
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. *Conformance* 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 of 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

	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
CONTENTS	**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:		Pass
	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

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

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

IEC62368_1B - ATTACHMENT			
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. *Justification:* 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

IEC62368_1B - ATTACHMENT			
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

IEC62368_1B - ATTACHMENT			
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. *Justification:* 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

	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 mm^2 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 JIC 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 × 1.1 × 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

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

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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 Vpeak 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 m3 (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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Clause	Requirement + Test	Result - Remark	Verdict
	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 m2 (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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Clause	Requirement + Test	Result - Remark	Verdict
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 1are 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

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
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 mm2).		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

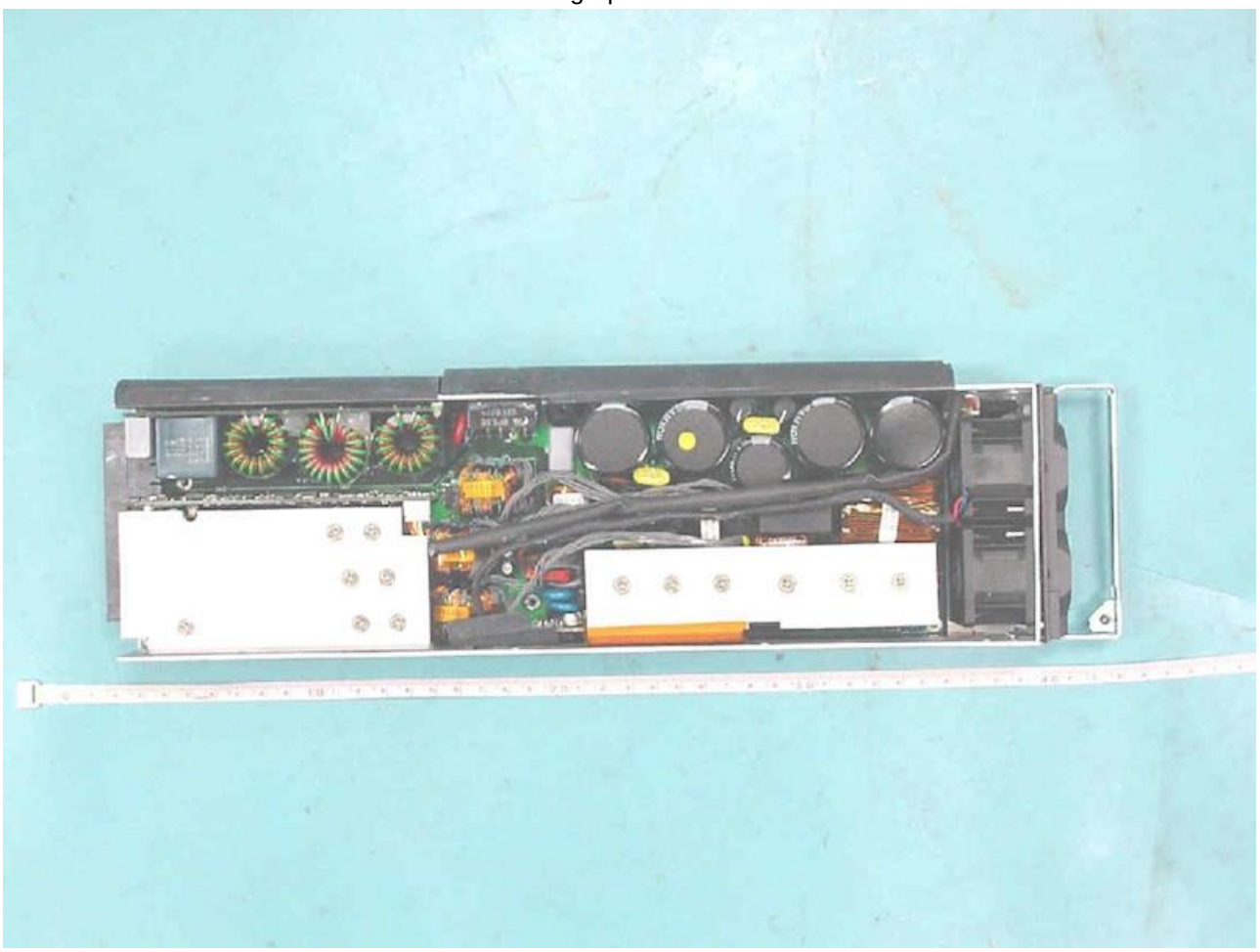
Type	Supplement Id	Description
Photographs	03-01	Overal View - Connector Side
Photographs	03-02	Overal View - Fan Side
Photographs	03-03	Internal View 1
Photographs	03-04	Internal View 2
Photographs	03-05	Trace - Main Board
Photographs	03-06	Trace - PFC/Bias Control Board
Diagrams	04-01	Specification 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

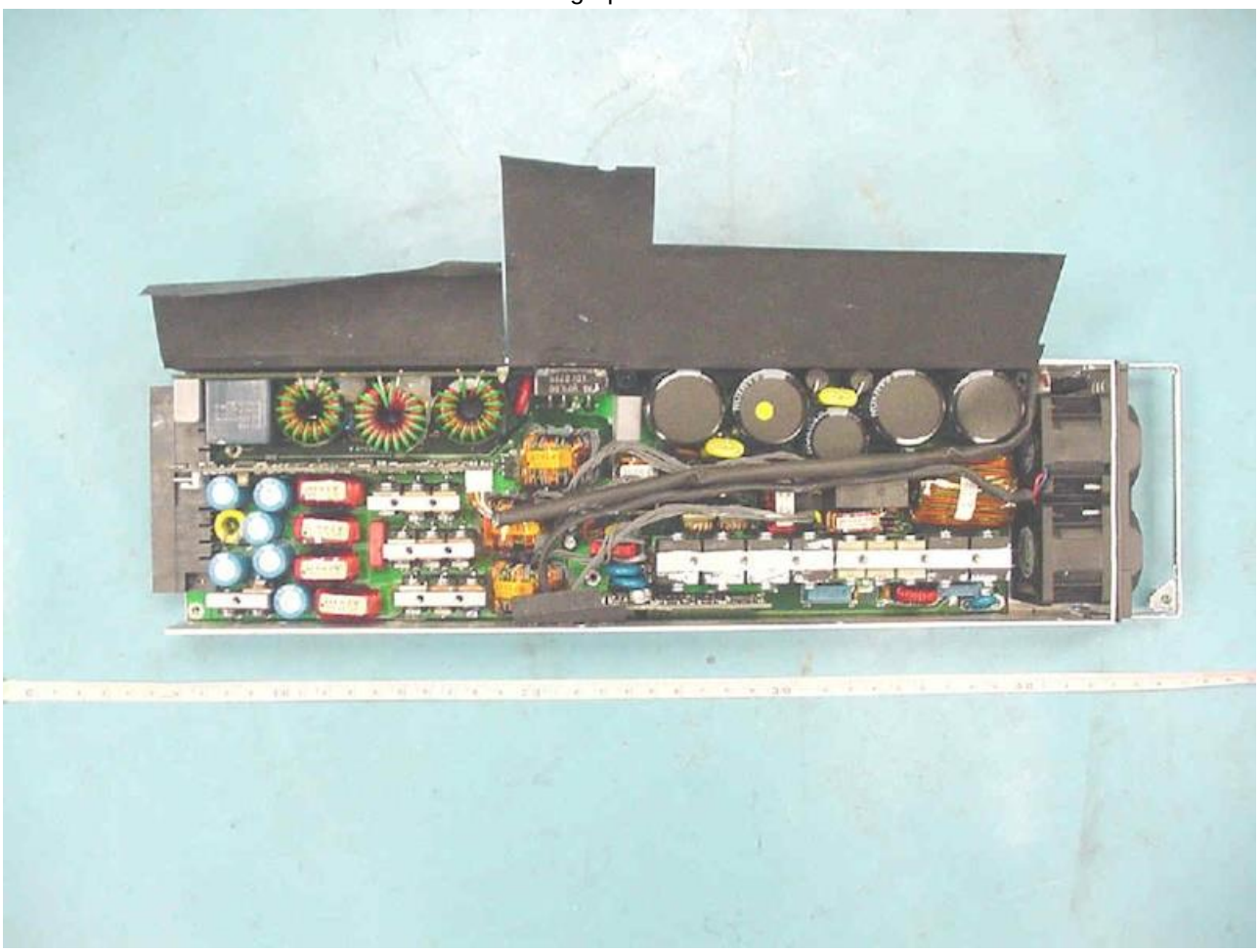
Photographs ID 03-02

Photographs ID 03-03



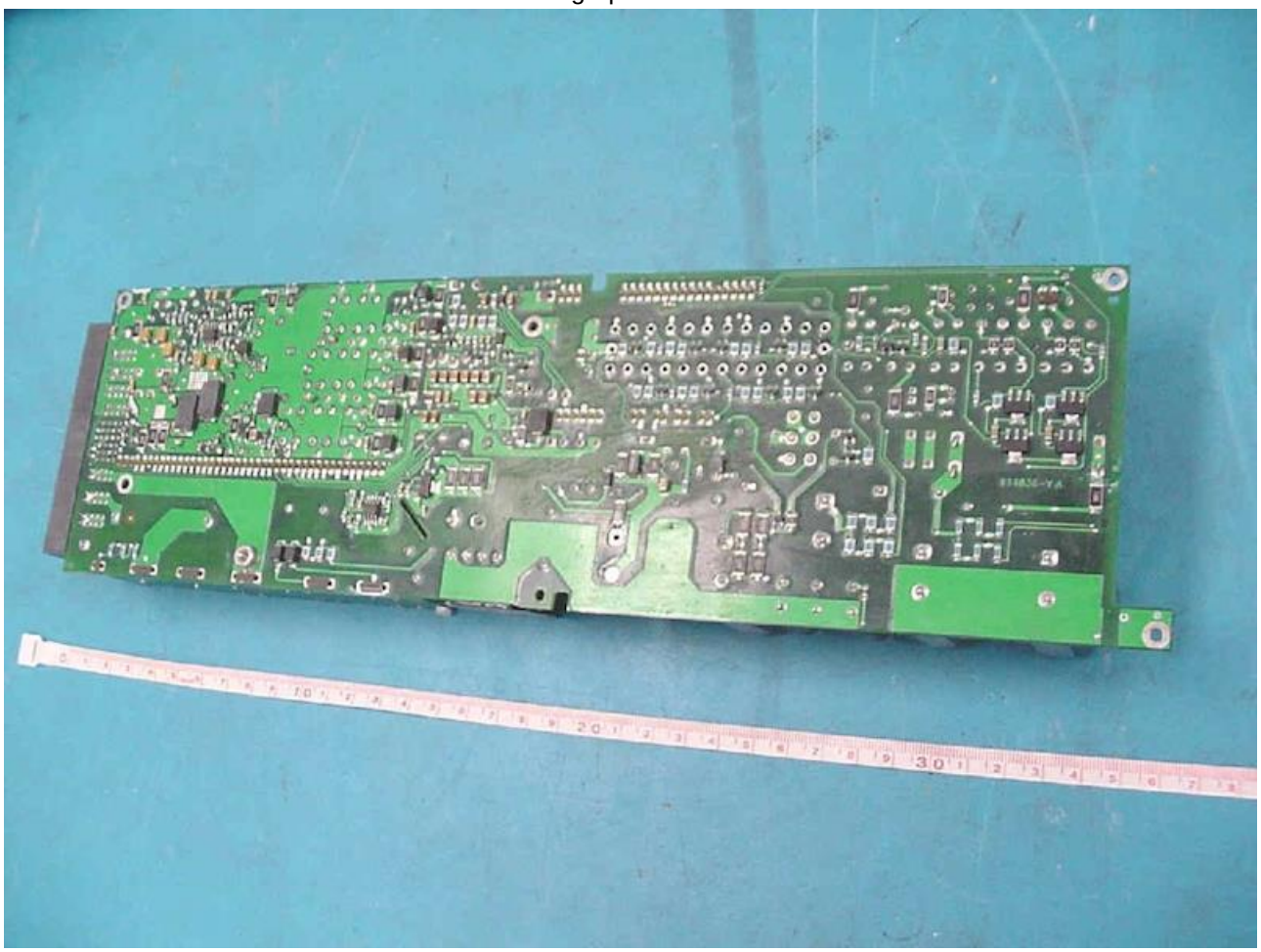
Enclosures

Photographs ID 03-04



Enclosures

Photographs ID 03-05



Photographs ID 03-06