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TEST REPORT
IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006
Information technology equipment – Safety –
Part 1: General requirements

Report Reference No. ..... :	139234	
Date of issue ..... :	January 11, 2009	
Total number of pages	95 pages and refer to page 13	
CB Testing Laboratory Name :	Nemko Taiwan	Phone: (+ 886) 2 8797 8790
Address ..... :	5 Fl., No. 409, Sec.2, Tiding Blvd., Neihu, Taipei 114, Taiwan	
Applicant's name ..... :	FSP Group Inc.	
Address ..... :	No. 22, Jianguo East Road, Taoyuan City 330, Taiwan	
Manufacturer's name ..... :	Same as applicant	
Address ..... :	Same as applicant	
Factory's name ..... :	See name and address of production-sites (Factories) for details.	
Address ..... :	See name and address of production-sites (Factories) for details.	
Test specification:		
Standard ..... :	☒ IEC 60950-1:2005 (2nd Edition) and/or ☒ EN 60950-1:2006, A11:2009	
Test procedure ..... :	CB	
Non-standard test method..... :	N/A	
Test Report Form No. ..... :	IECEN60950_1C (With unofficial A11)	
Test Report Form(s) Originator..... :	SGS Fimko Ltd (Nemko)	
Master TRF..... :	Dated 2007-06 (2008 02)	

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.

Report No. 139234

Test item description.....:	Switching Power Supply for building-in
Trade Mark .....:	1),4) FSP; 2) SPI; 3) Amacrox; 5) AOpen
Manufacturer .....:	Same as applicant
Model/Type reference .....:	1) FSP.-80.(85) (The first dot "." in the model name can be 460, 500 or 550 to denote different total output power. The second dot "." in the model name can be GHN or GCM to denote different enclosure shape.) 2) SPI.ACHBB (The dot "." in the model name can be 460, 500 or 550 to denote different total output power.) 3) AX.-85PLUS (The dot "." in the model name can be 450 or 550 to denote different total output power.) 4) EPSILON 85PLUS 500; EVEREST 85PLUS 500 5) AT85PLUS-550
Ratings .....:	I/P: See page 17 and 18. DC-outputs: See page 17 and 18.

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Testing procedure and testing location:	
☒ **CB Testing Laboratory**:	Nemko Taiwan
Testing location/ address ..... :	5 Fl., No. 409, Sec.2, Tiding Blvd., Neihu, Taipei 114, Taiwan
☐ **Associated CB Laboratory:**	
Testing location/ address ..... :	
Tested by (name + signature)..... :	Mars Chen
Approved by (+ signature)..... :	Wilson Wang
☐ Testing procedure: TMP	
Tested by (name + signature)..... :	
Approved by (+ signature)..... :	
Testing location/ address ..... :	
☐ Testing procedure: WMT	
Tested by (name + signature)..... :	
Witnessed by (+ signature) ..... :	
Approved by (+ signature)..... :	
Testing location/ address ..... :	
☐ Testing procedure: SMT	
Tested by (name + signature)..... :	
Approved by (+ signature)..... :	
Supervised by (+ signature)..... :	
Testing location/ address ..... :	
☐ Testing procedure: RMT	
Tested by (name + signature)..... :	
Approved by (+ signature)..... :	
Supervised by (+ signature)..... :	
Testing location/ address ..... :	

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Name and address of production-sites (Factories):

1. Shenzhen Huili Electronics Co., Ltd.
   Blk. C, Bldg. 7, County 73, Baoan Shenzhen, Guangdong, P.R. China

2. Fortron/Source (China) Corp.
   F2, The 2nd industrial Park Mabu, Xi Xiang, Baoan Area, Shenzhen, Guangdong, P.R. China

3. Zhonghan Electronics (Shenzhen) Co. Ltd.
   Juyuan Industrial Zone, Tangwei Village, Fuyong Town, Baoan District, ShenZhen, P.R. China

4. Wuxi SPI Technology Co., Ltd.
   No. 96, Xin Mei Road, New District, Wuxi City, Jiangsu, China

5. Wuxi Zhonghan Technology Co., Ltd.
   No. 96, Xin Mei Road, New District, Wuxi City, Jiangsu, China

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
1.6.2 Electrical data 1.7.11 Durability 2.1.1.5 c1) Max. V, A, VA test 2.1.1.7 Discharge of capacitors in equipment 2.2 Evaluation of voltage limiting components in SELV circuits 2.6.3.4 Resistance of earthing conductors and their terminations 2.9.2 Humidity conditioning 2.10.2 Working voltage measurement 2.10.3 and 2.10.4 Clearance and creepage distance measurements 2.10.5 Distance through insulation measurements 4.2.2 Steady force test, 10 N 4.2.3 Steady force test, 30 N 4.2.4 Steady force test, 250 N 4.2.5 Impact test 4.5 Thermal requirements 5.1 Touch current measurement 5.2 Electric strength tests 5.3 Fault condition test Annex C.2 Transformers Operation condition: Refer to General Product Information	See page 3

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Radio and television interference suppression compliance with the EMC directive is necessary for achieving type certification. The appliance shall comply with the relevant EMC standards, depending on the equipment in question. In NO, compliance with standards for radio interference suppression is a part of Nemko's certification. In FI, DK and SE compliance is not necessary for achieving safety certification.	The power supply has not been tested for EMC, the end product must be tested with this power supply installed.
Power supply for building-in.	Compliance with requirements regarding building-in, protection against electric shock must be checked in the end use.
1.5, 3.2.5 Power supply cord set.	Component for building-in, should be considered when install in the end product.
1.7.2.1, NOTE 3 Language of safety markings/instructions.	Instructions and equipment marking related to safety is applied in the language that is acceptable in the country in which the equipment is to be sold.
2.1.1.5 Energy hazards	The +12V1, +12V2, +12V3 and +12V4 outputs from the power supply represents an energy hazard. Must be considered for the end product.
2.7.5 Protection by several devices.	The standard require also a protective device in the neutral phase when connected to IT power system. For Norway, this is not required; refer to Lists of Decisions from OSM.
2.7.6 Warning to service personnel.	After operation of the protective device, the equipment is still under voltage if it is connected to an IT power system. A warning is required for service personnel. Norway does not require this warning.
Summary of compliance with National Differences: All CENELEC members as listed in EN 60950-1: 2006, A11: 2009. All CB members countries listed in CB Bulletin No. 112A, dated December 2006 as follows: Austria (AT), Australia (AU), Canada (CA), Germany (DE), Denmark (DK), Finland (FI), France (FR), United Kingdom (GB), Italy (IT), Japan (JP), Korea (KR), The Netherlands (NL), Norway (NO), Poland (PL), Sweden (SE), Singapore (SG), Slovenia (SI) and United States of America (US). All country differences listed in the CB Bulletin are covered by the Common Modifications, Special National Conditions, National Deviations, and National Requirements noted above except for the following countries which are documented in Country Differences. Attachments attached to this report: refer to List of attachments for details.	

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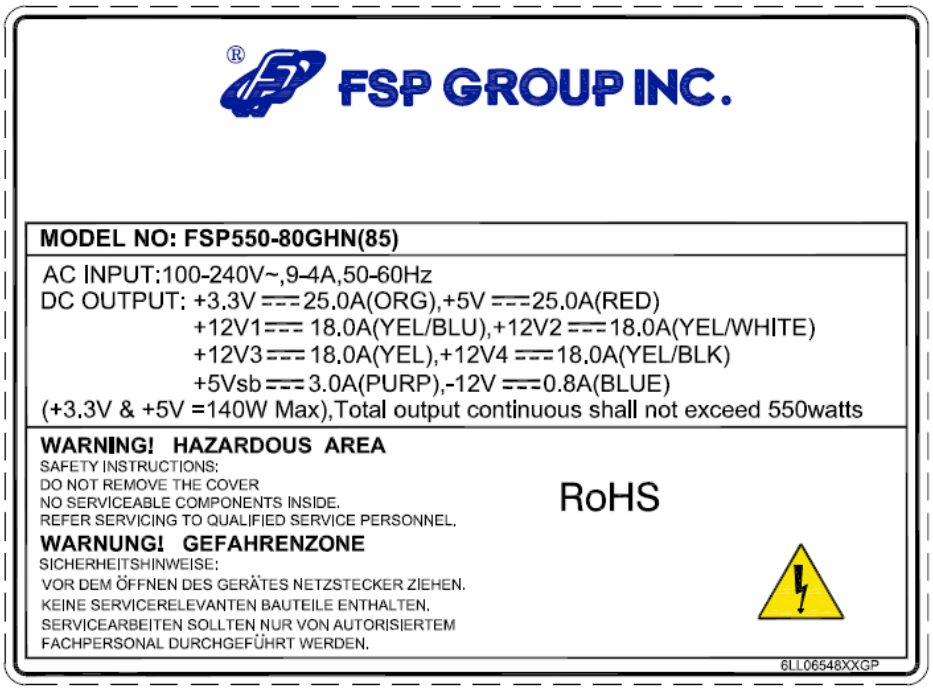

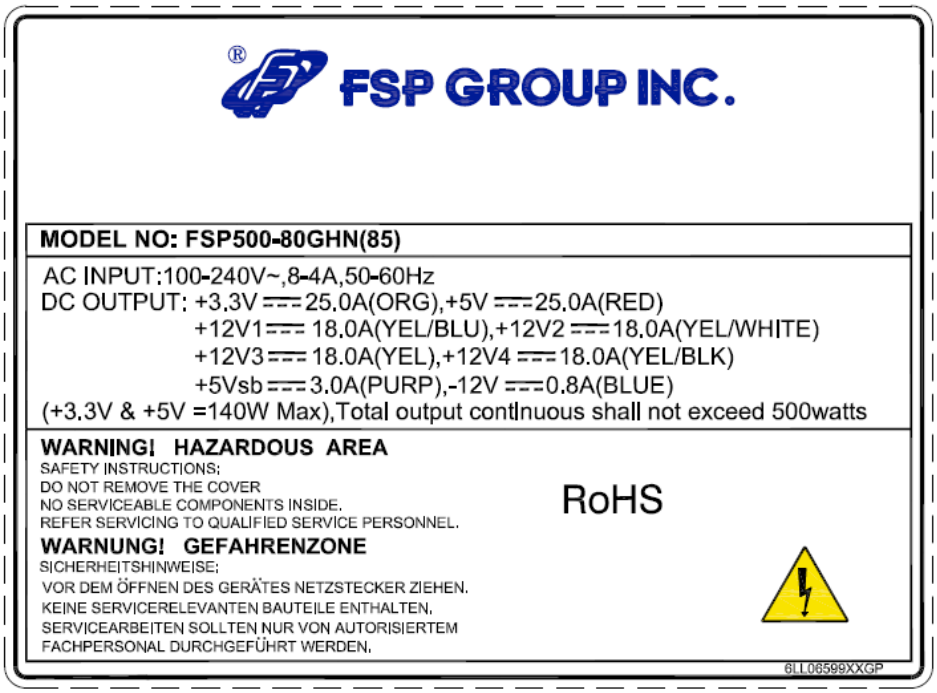

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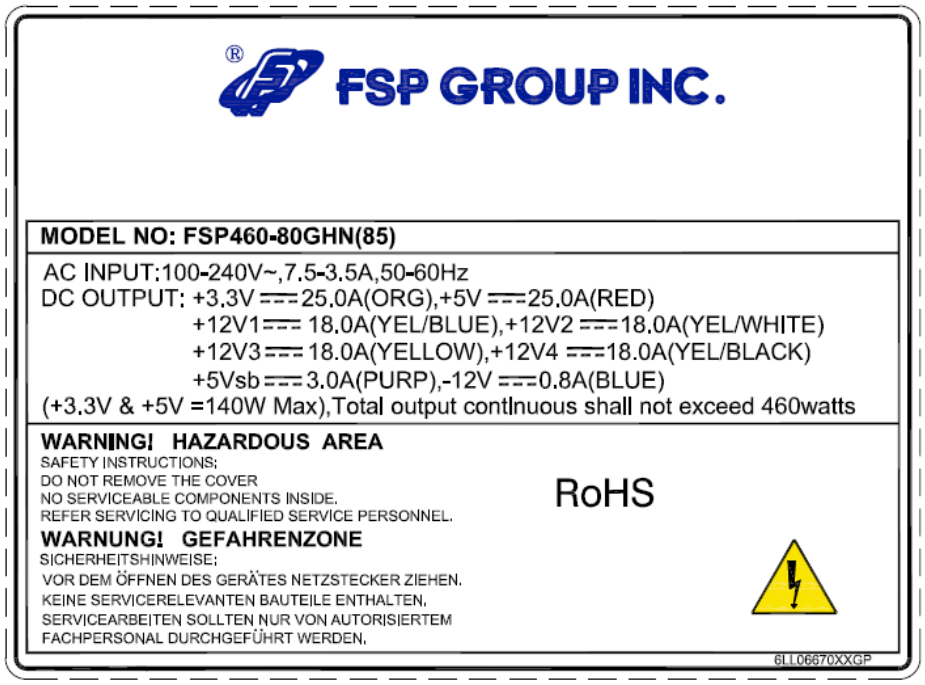

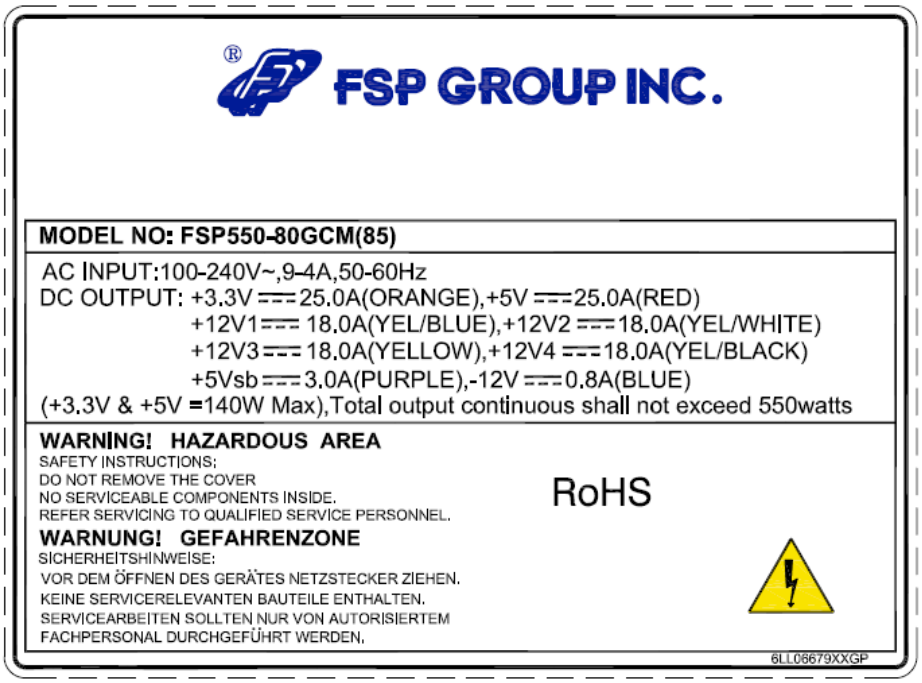

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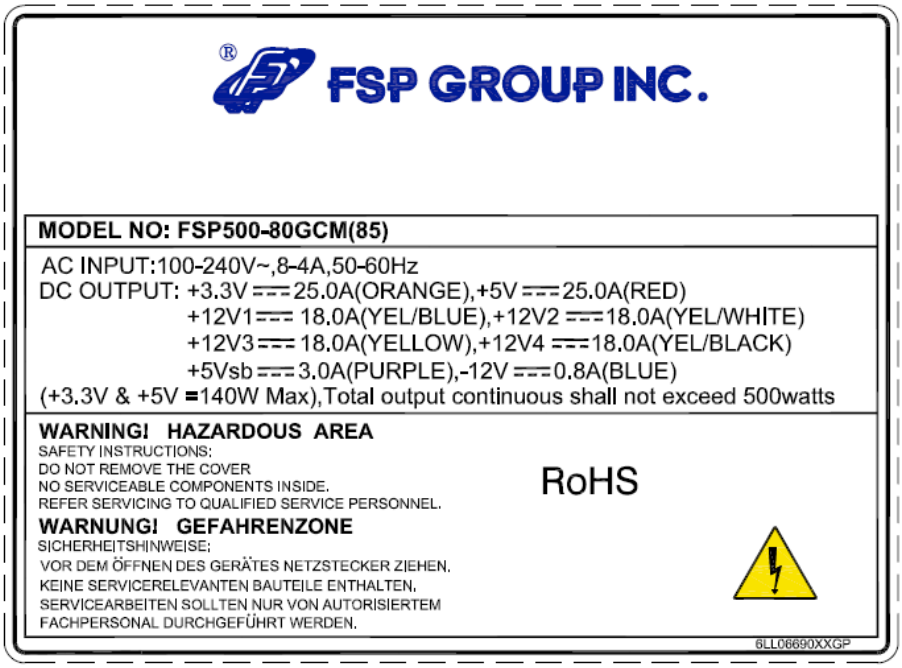

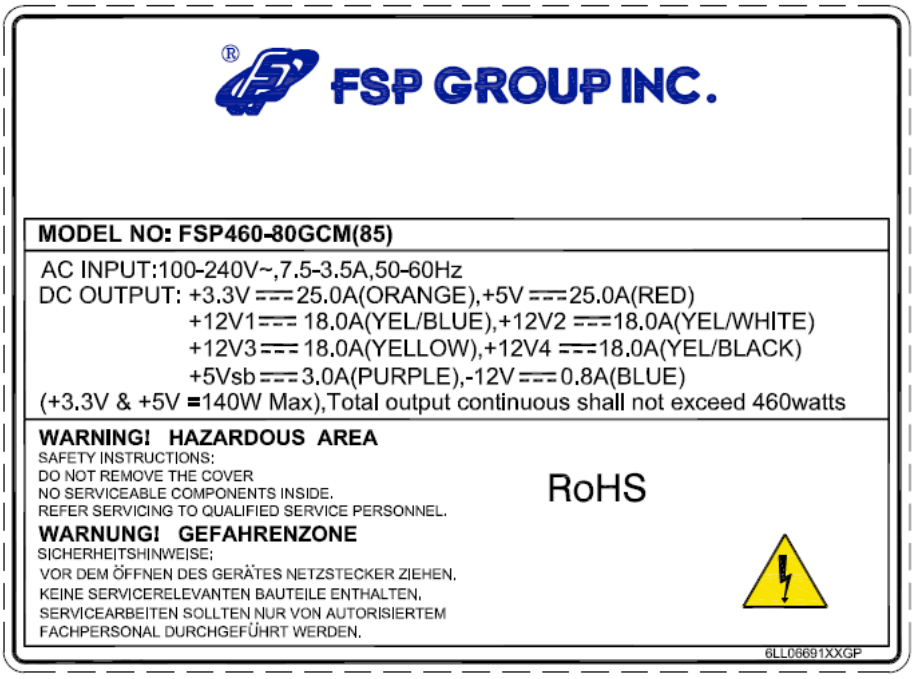

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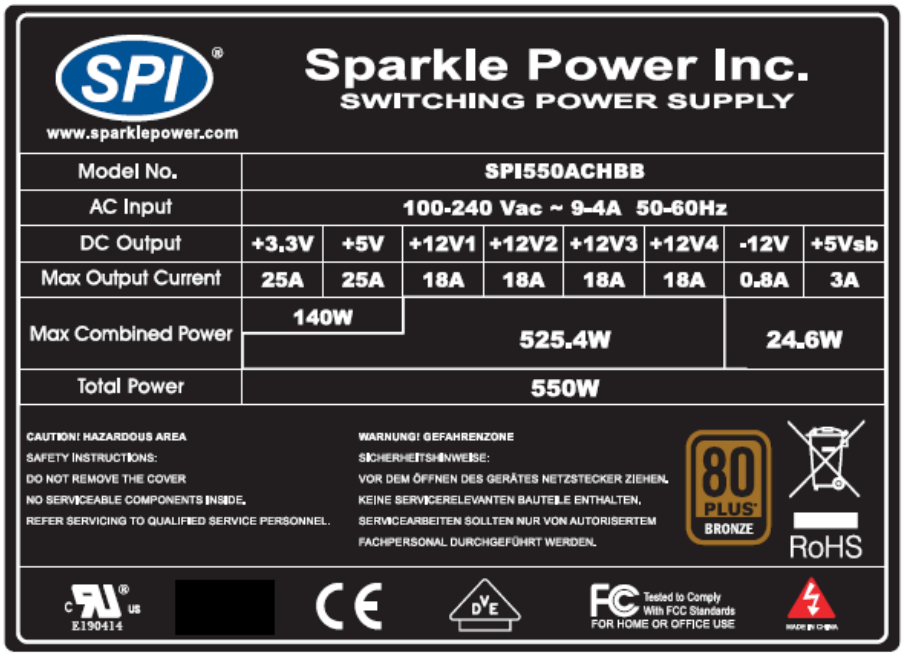

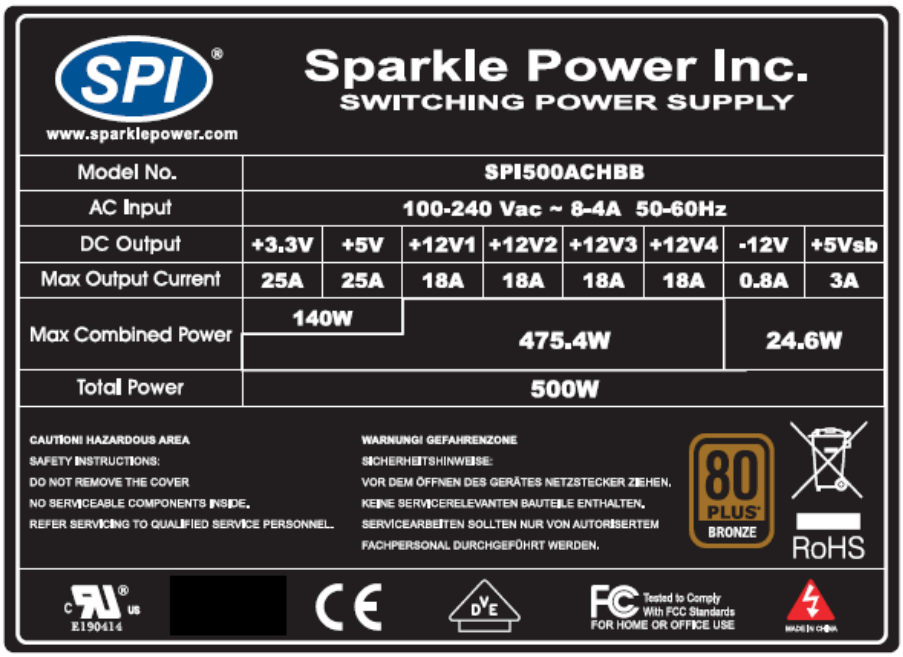

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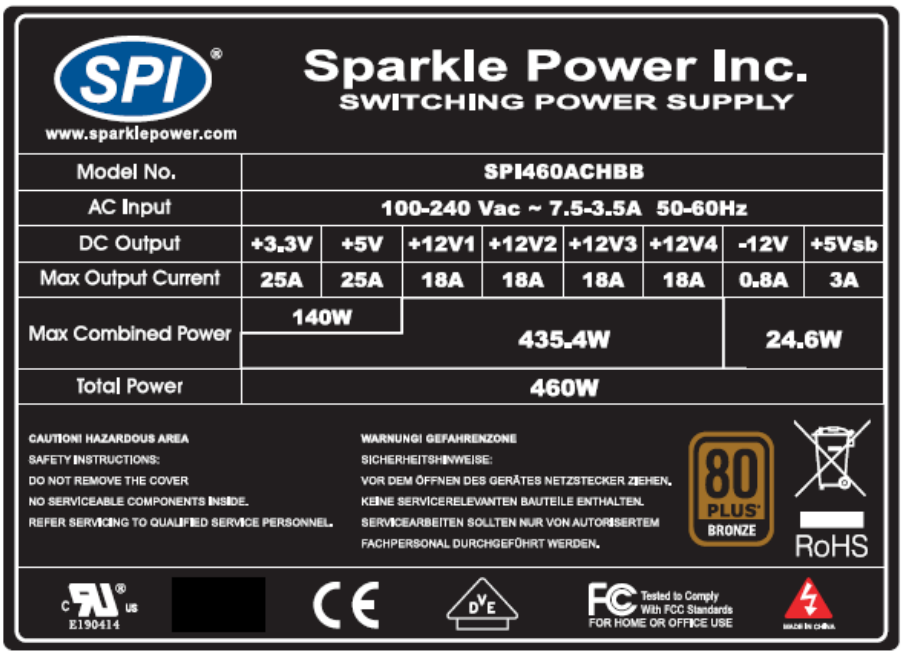

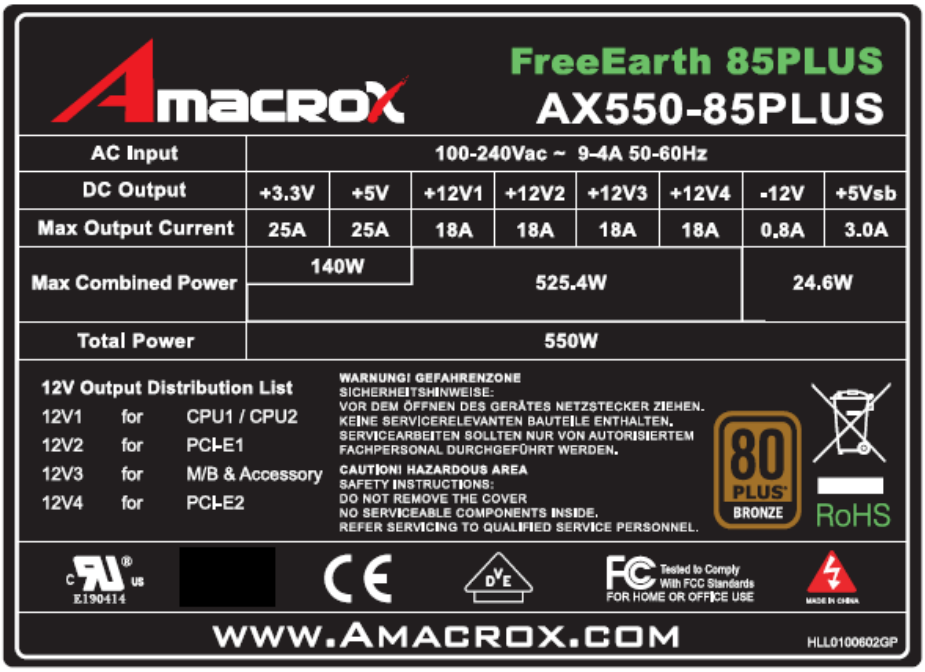

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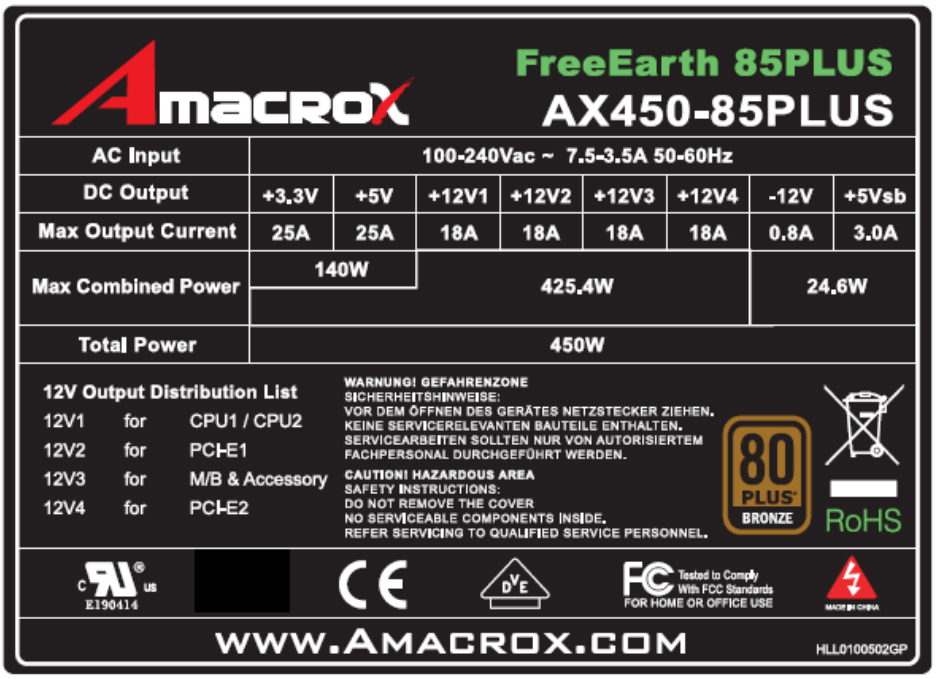

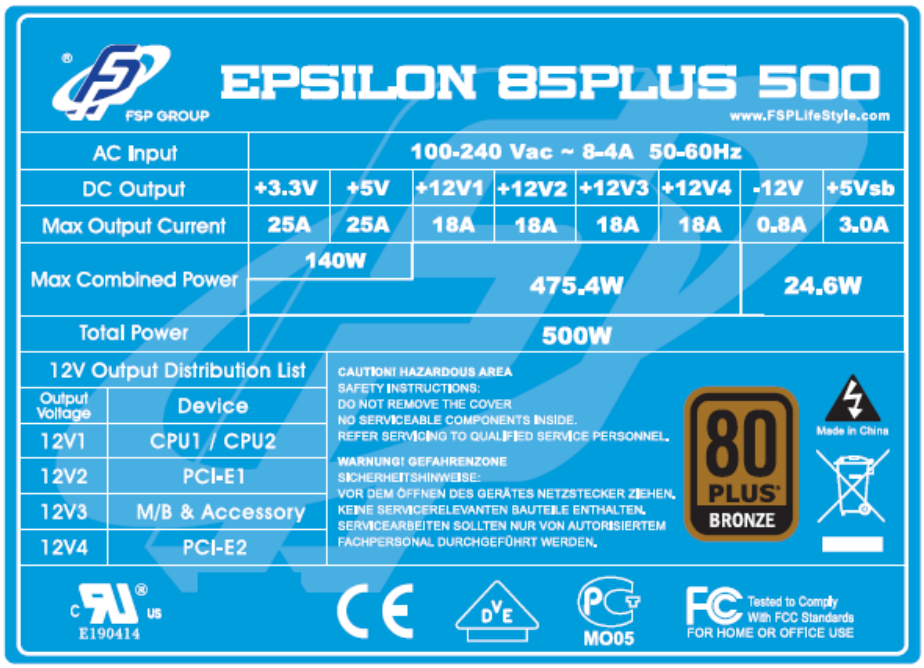

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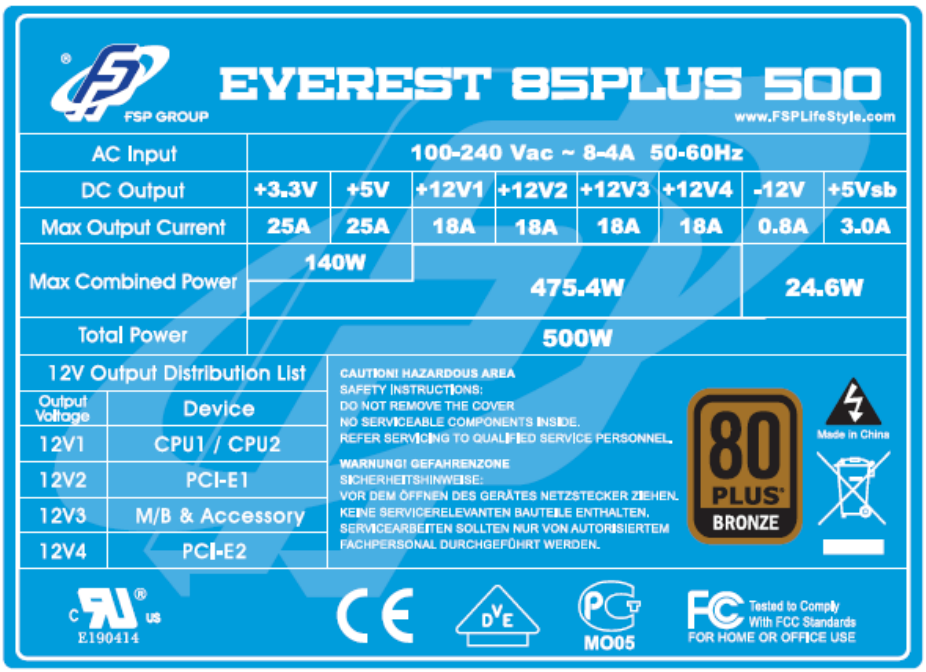

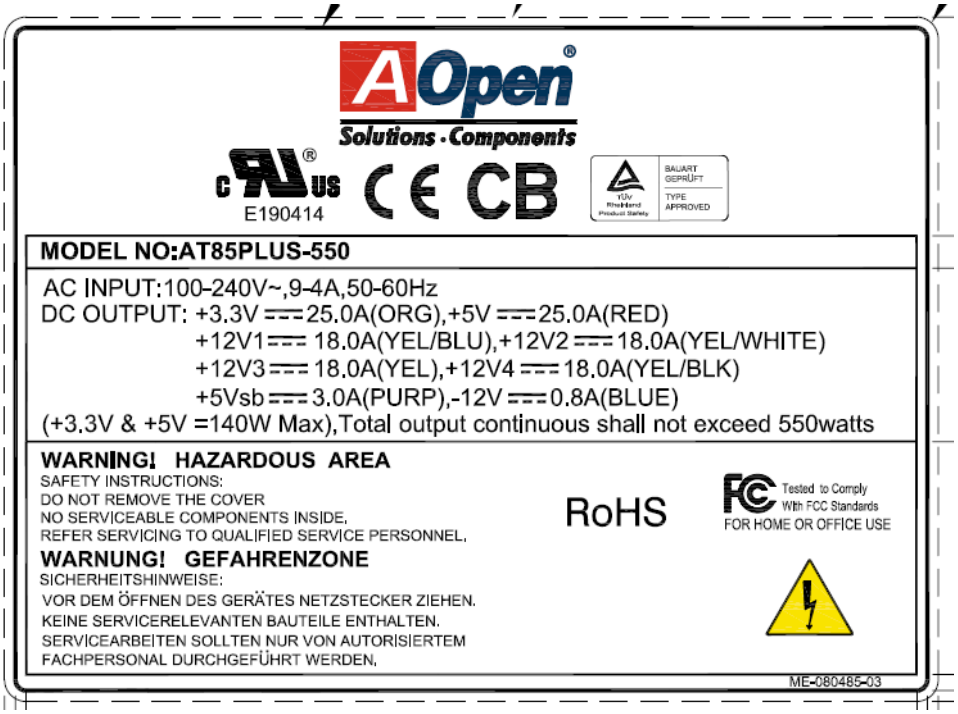

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List of attachments:

1. Photos (5 pages)
2. PCB layout (3 pages)
3. Transformer specification(s) (9 pages)

In addition the following national deviations according to IEC 60950-1 :2001 in CB bulletin 112A:
1. Australian differences (AS/NZS 60950.1-2003) (8 pages)
2. Singapore differences (3 pages)

In addition the following national deviations according to IEC 60950-1:2005 in CB bulletin 112A:
1. Korean differences (1 page)
2. Canadian differences (6 pages)
3. US differences (7 pages)

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Test item particulars ..... :	
Equipment mobility ..... :	[] movable [] hand-held [] transportable [] stationary [x] for building-in [] direct plug-in
Connection to the mains ..... :	[x] pluggable equipment [x] type A [] type B [] permanent connection [x] detachable power supply cord [] non-detachable power supply cord [] not directly connected to the mains
Operating condition ..... :	[x] continuous [] rated operating / resting time:
Access location ..... :	[x] operator accessible [] restricted access location
Over voltage category (OVC) ..... :	[] OVC I [x] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values ..... :	±10%
Tested for IT power systems ..... :	[x] Yes [] No
IT testing, phase-phase voltage (V) ..... :	230V
Class of equipment ..... :	[x] Class I [] Class II [] Class III [] Not classified
Considered current rating (A) ..... :	16A or 20A (for US and Canadian)
Pollution degree (PD) ..... :	[] PD 1 [x] PD 2 [] PD 3
IP protection class ..... :	IPX0
Altitude during operation (m) ..... :	Up to 2000m
Altitude of test laboratory (m) ..... :	Up to 2000m
Mass of equipment (kg) ..... :	For model FSP.-80GHN(85): 1.88kg Dimensions: 150 by 143 by 86.8 mm. For model FSP.-80GCM(85): 1.80kg Dimensions: 150 by 143 by 86.8 mm.
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 ..... :	December, 2009
Date(s) of performance of tests ..... :	December, 2009 – January, 2010

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General remarks:

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 testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

Throughout this report a point is used as the decimal separator.

General product information:
The equipment under test is class I switching power supply for building-in provided with metal enclosure and ventilated by one fan.

The EUT also fulfill IEC 60950-1 first edition requirement.

For model FSP.-80GHN(85): There are three pcbs provided in the PSU, CB(A) board contain primary circuits only, main board contains primary and secondary circuits, NK(B) board contain secondary circuits only.
For model FSP.-80GCM(85): There are four pcbs provided in the PSU, CB(A) board contain primary circuits only, main board contains primary and secondary circuits, NK(B) board and CN(D) board contain secondary circuits only.

Circuit characteristics: The equipment contains primary, secondary (SELV), limited current circuits.

Maximum recommended ambient (Tmra): 50°C

Models FSP.-80GHN(85) and FSP.-80GCM(85) are identical except model name, HS5, CN(D) board and enclosure shape.
Models SPI.ACHBB and AX.85PLUS are identical to models FSP.-80GHN(85) except model name and trade mark.
Model EPSILON85PLUS 500 is identical to model FSP500-80GHN(85) except model name and trade mark.
Model EVEREST 85PLUS 500 is identical to model FSP500-80GCM(85) except model name and trade mark.
Model AT85PLUS-550 is identical to model FSP550-80GCM(85) except model name and trade mark.

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General product information: (Continued)

Operation condition:

For model FSP550-80GHN(85), FSP550-80GCM(85):

Condition A: 25A +3.3V, 11.5A +5V, 18A +12V1, 14.2A +12V2, 0A +12V3, 0 A +12V4, 3A +5Vsb, 0.8A -12V

Condition B: 4.6A +3.3V, 25A +5V, 18A +12V1, 14.2A +12V2, 0A +12V3, 0 A +12V4, 3A +5Vsb, 0.8A -12V

Condition C: 0A +3.3V, 1A +5V, 0A +12V1, 7.4A +12V2, 18A +12V3, 18 A +12V4, 3A +5Vsb, 0.8A -12V

Condition D: 0A +3.3V, 0A +5V, 0A +12V1, 0A +12V2, 0A +12V3, 0A +12V4, 3A +5Vsb, 0A -12V

For model FSP500-80GHN(85), FSP500-80GCM(85):

Condition A: 25A +3.3V, 11.5A +5V, 18A +12V1, 10A +12V2, 0A +12V3, 0 A +12V4, 3A +5Vsb, 0.8A -12V

Condition B: 4.6A +3.3V, 25A +5V, 18A +12V1, 10A +12V2, 0A +12V3, 0 A +12V4, 3A +5Vsb, 0.8A -12V

Condition C: 0A +3.3V, 1A +5V, 0A +12V1, 3.2A +12V2, 18A +12V3, 18 A +12V4, 3A +5Vsb, 0.8A -12V

For model FSP460-80GHN(85), FSP460-80GCM(85):

Condition A: 25A +3.3V, 11.5A +5V, 18A +12V1, 6.7A +12V2, 0A +12V3, 0 A +12V4, 3A +5Vsb, 0.8A -12V

Condition B: 4.6A +3.3V, 25A +5V, 18A +12V1, 6.7A +12V2, 0A +12V3, 0 A +12V4, 3A +5Vsb, 0.8A -12V

Condition C: 0A +3.3V, 1A +5V, 0A +12V1, 0A +12V2, 18A +12V3, 18 A +12V4, 3A +5Vsb, 0.8A -12V

Unless otherwise specified, the tests were performed on FSP550-80GHN(85) and FSP550-80GCM(85) to represent other similar models. All testing is performed in load condition A if nothing else is mentioned.

1.1.2 - Additional requirements:

Exposure to extreme temperatures, excessive dust, moisture or vibration; to flammable gases; to corrosive or explosive atmospheres:

This equipment is intended to operate in a "normal" environment (Offices and homes).

Electromedical equipment connected to the patient:

This equipment is not an electromedical equipment intended to be physically connected to a patient.

Equipment used in vehicles, ships or aircrafts, in tropical countries, or at elevations > 2000m:

This equipment is intended to operate in a "normal" environment (Offices and homes).

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General product information: (Continued)

DC output rating:

Model	Input rating	DC output rating
FSP550-80GHN(85)	9-4A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., Output max. combine power is 550W
FSP500-80GHN(85)	8-4A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., Output max. combine power is 500W
FSP460-80GHN(85)	7.5-3.5A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., Output max. combine power is 460W
FSP550-80GCM(85)	9-4A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., Output max. combine power is 550W
FSP500-80GCM(85)	8-4A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., Output max. combine power is 500W
FSP460-80GCM(85)	7.5-3.5A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., Output max. combine power is 460W
SPI550ACHBB	9-4A 100-240V 50-60Hz	25A +3.3V, 25A +5V, 18A +12V1, 18A +12V2, 18A +12V3, 18A +12V4, 3A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., +3.3V & +5V & +12V1 & +12V2 & +12V3 & +12V4 = 525.4W Output max. combine power is 550W
SPI500ACHBB	8-4A 100-240V 50-60Hz	25A +3.3V, 25A +5V, 18A +12V1, 18A +12V2, 18A +12V3, 18A +12V4, 3A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., +3.3V & +5V & +12V1 & +12V2 & +12V3 & +12V4 = 475.4W Output max. combine power is 500W

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General product information: (Continued)

DC output rating:

Model	Input rating	DC output rating
SPI460ACHBB	7.5-3.5A 100-240V 50-60Hz	25A +3.3V, 25A +5V, 18A +12V1, 18A +12V2, 18A +12V3, 18A +12V4, 3A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., +3.3V & +5V & +12V1 & +12V2 & +12V3 & +12V4 = 435.4W Output max. combine power is 460W
AX550-85PLUS	9-4A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., +3.3V & +5V & +12V1 & +12V2 & +12V3 & +12V4 = 525.4W Output max. combine power is 550W
AX450-85PLUS	7.5-3.5A 100-240V 50-60Hz	25A +3.3V, 25A +5V, 18A +12V1, 18A +12V2, 18A +12V3, 18A +12V4, 3A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., +3.3V & +5V & +12V1 & +12V2 & +12V3 & +12V4 = 425.4W Output max. combine power is 450W
EPSILON 85PLUS 500	8-4A 100-240V 50-60Hz	25A +3.3V, 25A +5V, 18A +12V1, 18A +12V2, 18A +12V3, 18A +12V4, 3A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., +3.3V & +5V & +12V1 & +12V2 & +12V3 & +12V4 = 475.4W Output max. combine power is 500W
EVEREST 85PLUS 500	8-4A 100-240V 50-60Hz	25A +3.3V, 25A +5V, 18A +12V1, 18A +12V2, 18A +12V3, 18A +12V4, 3A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., +3.3V & +5V & +12V1 & +12V2 & +12V3 & +12V4 = 475.4W Output max. combine power is 500W
AT85PLUS-550	9-4A 100-240V 50-60Hz	25.0A +3.3V, 25.0A +5V, 18.0A +12V1, 18.0A +12V2, 18.0A +12V3, 18.0A +12V4, 3.0A +5Vsb, 0.8A -12V +3.3V & +5V = 140W Max., Output max. combine power is 550W

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IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General		—
	Comply with IEC 60950-1 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 60950-1 and the relevant component standard. Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 60950-1.	P
1.5.3	Thermal controls	No thermal controls.	N
1.5.4	Transformers	Transformers used are suitable for their intended applications and comply with relevant parts of this standard and particularly Annex C, see Annex C – Transformers.	P
1.5.5	Interconnecting cables	The interconnecting cables contain only SELV.	P
1.5.6	Capacitors bridging insulation	X1 or X2 and Y1 or Y2 capacitors according to IEC 60384-14:1993. Double / reinforced insulation is bridged by single capacitor (CY8). Capacitor separately certified, ref. List of Critical Components. Circuit complies with 2.4.	P
1.5.7	Resistors bridging insulation	Refer below:	—

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Clause	Requirement + Test	Result - Remark	Verdict
1.5.7.1	Resistors bridging functional, basic or supplementary insulation	1) Certified discharge resistors (RX4) bridging functional insulation before fuse, complied with requirement. 2) No special requirement for RX1 and RX2 (two in series) bridging primary functional insulation after fuse.	**P**
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits	No resistors bridging double or reinforced insulation.	**N**
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable	No antenna or coaxial cable.	**N**
1.5.8	Components in equipment for IT power systems	Certified capacitors connected between line and earth, ref. List of Critical Components.	**P**
1.5.9	Surge suppressors	Certified VDR connected between line and neutral after fuse, ref. List of Critical Components and Annex Q.	**P**
1.5.9.1	General	Refer to sub-clause 1.5.9.	**P**
1.5.9.2	Protection of VDRs	Mains fuse F1 used as protection of varistor which located after mains fuse.	**P**
1.5.9.3	Bridging of functional insulation by a VDR	Refer to sub-clause 1.5.9.	**P**
1.5.9.4	Bridging of basic insulation by a VDR	No Varistor bridging basic insulation.	**N**
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR	No Varistor bridging supplementary, double or reinforced insulation.	**P**

1.6	Power interface		**P**
1.6.1	AC power distribution systems	TN, and IT for Norway.	**—**
1.6.2	Input current	(see appended table 1.6.2)	**P**
1.6.3	Voltage limit of hand-held equipment	The equipment is not hand-held.	**N**
1.6.4	Neutral conductor	Neutral is insulated from earth with basic insulation throughout the equipment.	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
1.7	Marking and instructions		P
1.7.1	Power rating	The required marking is located on the outside surface of the equipment.	P
	Rated voltage(s) or voltage range(s) (V) ..... :	100-240V	—
	Symbol for nature of supply, for d.c. only ..... :	The equipment is for a.c. supply.	N
	Rated frequency or rated frequency range (Hz) ... :	50-60Hz	—
	Rated current (mA or A) ..... :	See page 17 and 18 for details	—
	Manufacturer's name or trade-mark or identification mark ..... :	1),4) FSP 2) SPI 3) Amacrox 5) AOpen	—
	Model identification or type reference ..... :	1) FSP.-80.(85) 2) SPI.ACHBB 3) AX.-85PLUS 4) EPSILON 85PLUS 500; EVEREST 85PLUS 500 5) AT85PLUS-550	—
	Symbol for Class II equipment only ..... :	The equipment is Class I.	N
	Other markings and symbols ..... :	The additional marking does not give rise to misunderstandings.	P
	Certification marks ..... :	Refer to copy of marking plate.	—
1.7.2	Safety instructions and marking	Must be checked in the end product.	N
1.7.2.1	General	Refer to sub-clause 1.7.2.	N
1.7.2.2	Disconnect devices	The appliance coupler is acting as disconnect device.	N
1.7.2.3	Overcurrent protective device	Not applicable for pluggable equipment type A equipment.	N

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Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.4	IT power distribution systems	The following or similar information should be given in the installation instruction:"This product is also designed for IT power distribution system with phase-to-phase voltage 230V".	**P**
1.7.2.5	Operator access with a tool	All areas containing hazard(s) are inaccessible to the operator.	**P**
1.2.7.6	Ozone	The equipment not containing Ozone.	**N**
1.7.3	Short duty cycles	The equipment is intended for continuous operation.	**N**
1.7.4	Supply voltage adjustment ..... :	No voltage selector.	**N**
	Methods and means of adjustment; reference to installation instructions ..... :		**—**
1.7.5	Power outlets on the equipment ..... :	No standard power outlet.	**N**
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) ..... :	Fuse location and marking: F1 and T10A 250V	**P**
1.7.7	Wiring terminals	Refer below:	**—**
1.7.7.1	Protective earthing and bonding terminals ..... :	Appliance inlet, marking of the protective earthing terminal is not applicable.	**N**
1.7.7.2	Terminals for a.c. mains supply conductors	The equipment is not permanently connected or provided with a non-detachable power supply cord.	**N**
1.7.7.3	Terminals for d.c. mains supply conductors	The equipment is not permanently connected or provided with a non-detachable power supply cord.	**N**
1.7.8	Controls and indicators	Refer below:	**—**
1.7.8.1	Identification, location and marking ..... :	No controls.	**N**
1.7.8.2	Colours ..... :	No controls.	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
1.7.8.3	Symbols according to IEC 60417 .....:	The mains switch is marked with the symbols: "O" and "I" (IEC 60417-1 No. 5008 and 5007).	P
1.7.8.4	Markings using figures .....:	No controls.	N
1.7.9	Isolation of multiple power sources .....:	Only one connection supplying hazardous voltages and energy levels to the equipment.	N
1.7.10	Thermostats and other regulating devices .....:	No thermostats or other regulating devices.	N
1.7.11	Durability	The marking withstands required tests.	P
1.7.12	Removable parts	No marking is placed on removable parts.	P
1.7.13	Replaceable batteries .....:	No battery in the equipment.	N
	Language(s) .....:		—
1.7.14	Equipment for restricted access locations.....:	Equipment not intended for installation in RAL.	N

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	Refer below:	—
2.1.1.1	Access to energized parts	This is a component level power supply. Protection must be checked in the end product.	—
	Test by inspection ..... :		—
	Test with test finger (Figure 2A) ..... :		—
	Test with test pin (Figure 2B) ..... :		—
	Test with test probe (Figure 2C) ..... :	No TNV circuits in the equipment.	N
2.1.1.2	Battery compartments	No battery compartments in the equipment.	N
2.1.1.3	Access to ELV wiring	No internal wiring at ELV accessible to the operator.	N
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.4	Access to hazardous voltage circuit wiring	All accessible parts are separated from internal wiring at hazardous voltage by double or reinforced insulation.	**P**
2.1.1.5	Energy hazards ..... :	The +12V1, +12V2, +12V3 and +12V4 outputs from the power supply represents an energy hazard. Must be considered for the end product. (See appended table 2.1.1.5)	**—**
2.1.1.6	Manual controls	No shafts of knobs etc. at ELV or hazardous voltage or TNV.	**N**
2.1.1.7	Discharge of capacitors in equipment	The capacitance of the input circuit is > 0.1µF. The measurements were performed in the fuse in and fuse out condition.	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
	Measured voltage (V); time-constant (s) ..... :	Condition A: No load, Fuse in: CX1=0.68uF, CX3=0.47uF, CX4=0.33uF, RX1=RX2=470kΩ, RX4=2.2MΩ (measured 370 Vpeak, 37% Vpeak=137V) Time constant is measured to 390ms. Fuse out: CX4=0.33uF, RX4=2.2MΩ (measured 376 Vpeak, 37% Vpeak=139V) Time constant is measured to 596ms. Condition B: No load, Fuse in: CX1=0.68uF, CX3=0.47uF, CX4=0.22uF, RX1=RX2=470kΩ, RX4=3.3MΩ (measured 370 Vpeak, 37% Vpeak=137V) Time constant is measured to 350ms. Fuse out: CX4=0.22uF, RX4=3.3MΩ (measured 376 Vpeak, 37% Vpeak=139V) Time constant is measured to 534ms.	P
2.1.1.8	Energy hazards – d.c. mains supply	The equipment is not connected to d.c. mains supply	N
	a) Capacitor connected to the d.c. mains supply . :		—
	b) Internal battery connected to the d.c. mains supply ..... :		—
2.1.1.9	Audio amplifiers ..... :	No such parts.	N
2.1.2	Protection in service access areas	Checked by inspection, unintentional contact is unlikely during service operations.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.1.3	Protection in restricted access locations	Equipment not intended for installation in RAL.	**N**
2.2	SELV circuits		**P**
2.2.1	General requirements	SELV limits are not exceeded under normal condition and after a single fault.	**P**
2.2.2	Voltages under normal conditions (V) ..... :	Within SELV limits.	**P**
2.2.3	Voltages under fault conditions (V) ..... :	Within SELV limits. (see appended table 2.2)	**P**
2.2.4	Connection of SELV circuits to other circuits .....:	SELV circuits are only connected to other SELV, limited current circuits and protective earth.	**P**
2.3	TNV circuits		**N**
2.3.1	Limits	Refer below:	**N**
	Type of TNV circuits ..... :	No TNV circuits in the equipment.	**—**
2.3.2	Separation from other circuits and from accessible parts		**N**
2.3.2.1	General requirements		**N**
2.3.2.2	Protection by basic insulation		**N**
2.3.2.3	Protection by earthing		**N**
2.3.2.4	Protection by other constructions ..... :		**N**
2.3.3	Separation from hazardous voltages		**N**
	Insulation employed..... :		**—**
2.3.4	Connection of TNV circuits to other circuits		**N**
	Insulation employed..... :		**—**
2.3.5	Test for operating voltages generated externally		**N**
2.4	Limited current circuits		**P**
2.4.1	General requirements	Limits are not exceeded.	**P**
2.4.2	Limit values	***1)*** 0.7 mA ***2)*** 47.32 mA	**—**

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Clause	Requirement + Test	Result - Remark	Verdict
	Frequency (Hz) ..... :	***1)*** 60.0 Hz ***2)*** 67.6 kHz	—
	Measured current (mA)..... :	***1)*** 0.59 mA ***2)*** 8.7 mA	—
	Measured voltage (V) ..... :	***1)*** 1.18 Vp ***2)*** 17.4 Vp	—
	Measured circuit capacitance (nF or µF)..... :	Total capacitance is < 0.1µF	**P**
2.4.3	Connection of limited current circuits to other circuits	Under normal operating condition and no fault condition can cause higher current.	**P**
2.5	Limited power sources		**N**
	a) Inherently limited output	No limited power source.	**N**
	b) Impedance limited output		**N**
	c) Regulating network limited output under normal operating and single fault condition		**N**
	d) Overcurrent protective device limited output		**N**
	Max. output voltage (V), max. output current (A), max. apparent power (VA)..... :		**N**
	Current rating of overcurrent protective device (A) .:		**N**
2.6	Provisions for earthing and bonding		**P**
2.6.1	Protective earthing	Accessible conductive parts are reliably connected to protective earth.	**P**
2.6.2	Functional earthing	Functional earthing is separated from hazardous voltages by reinforced insulation.	**P**
2.6.3	Protective earthing and protective bonding conductors	Refer below:	—
2.6.3.1	General	Refer below:	—
2.6.3.2	Size of protective earthing conductors	Power supply cord not provided with the equipment.	**N**
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
2.6.3.3	Size of protective bonding conductors	Refer to 2.6.3.4	**N**
	Rated current (A), cross-sectional area (mm^2), AWG ..... :	Refer to 2.6.3.4	—
	Protective current rating (A), cross-sectional area (mm^2), AWG ..... :	Refer to 2.6.3.4	—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min) ..... :	For model GSP.-80GHN(85): From the appliance inlet to the end of chassis: U=0.28V⇒8.75mΩ(32A/ 2min.) U=0.37V⇒9.25mΩ(40A/ 2min.) From the appliance inlet to PCB output "-": U=0.29V⇒9.06mΩ(32A/ 2min.) U=0.39V⇒9.75mΩ(40A/ 2min.) For model GSP.-80GCM(85): From the appliance inlet to the end of chassis: U=0.34V⇒10.63mΩ(32A/ 2min.) U=0.45V⇒11.25mΩ(40A/ 2min.) From the appliance inlet to PCB output "-": U=0.29V⇒9.06mΩ(32A/ 2min.) U=0.39V⇒9.75mΩ(40A/ 2min.)	**P**
2.6.3.5	Colour of insulation..... :	All insulated protective earth conductors are used coloured green and yellow.	**P**
2.6.4	Terminals	Refer below:	—
2.6.4.1	General	Refer below:	—
2.6.4.2	Protective earthing and bonding terminals	Refer below:	—
	Rated current (A), type, nominal thread diameter (mm) ..... :	The equipment is provided with an appliance inlet.	**P**
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	The equipment is provided with an appliance inlet.	**N**
2.6.5	Integrity of protective earthing	Refer below:	—

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Clause	Requirement + Test	Result - Remark	Verdict
2.6.5.1	Interconnection of equipment	No interconnection of equipment.	**N**
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	There are no switches or overcurrent protective devices in the protective earthing / bonding conductors.	**N**
2.6.5.3	Disconnection of protective earth	It is not possible to disconnect protective earth without disconnecting mains; an appliance coupler will be used as disconnect device.	**P**
2.6.5.4	Parts that can be removed by an operator	No operator removable parts with protective earth connection except supply cord.	**P**
2.6.5.5	Parts removed during servicing	Protective earthed parts cannot be removed in a way which impair safety.	**P**
2.6.5.6	Corrosion resistance	No risk of corrosion.	**P**
2.6.5.7	Screws for protective bonding	Adequate connection of protective bonding.	**P**
2.6.5.8	Reliance on telecommunication network or cable distribution system	No TNV circuits in the equipment.	**N**
2.7	Overcurrent and earth fault protection in primary circuits		**P**
2.7.1	Basic requirements	Protective devices are integrated in the equipment, see also Sub-clause 5.3.	**P**
	Instructions when protection relies on building installation	Protective devices are integrated in the equipment.	**P**
2.7.2	Faults not simulated in 5.3.7	Considered.	**P**
2.7.3	Short-circuit backup protection	Adequate protective device.	**P**
2.7.4	Number and location of protective devices ..... :	In Norway, IT power distribution system is used. Equipment with a single protective device is accepted in Norway.	**P**
2.7.5	Protection by several devices	Only one protective device. See Sub-clause 2.7.4.	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
2.7.6	Warning to service personnel..... :	After operation of the protective device, the equipment is still under voltage if it is connected to an IT-power distribution system. A warning is required for service personnel. Norway does not require this warning. See also Sub-clause 2.7.4.	**N**
2.8	Safety interlocks		**N**
2.8.1	General principles	No safety interlock provided.	**N**
2.8.2	Protection requirements		**N**
2.8.3	Inadvertent reactivation		**N**
2.8.4	Fail-safe operation		**N**
2.8.5	Moving parts		**N**
2.8.6	Overriding		**N**
2.8.7	Switches and relays		**N**
2.8.7.1	Contact gaps (mm) ..... :		**N**
2.8.7.2	Overload test		**N**
2.8.7.3	Endurance test		**N**
2.8.7.4	Electric strength test		**N**
2.8.8	Mechanical actuators		**N**
2.9	Electrical insulation		**P**
2.9.1	Properties of insulating materials	Neither natural rubber, materials containing asbestos nor hygroscopic materials are used as insulation. No driving belts or couplings used.	**N**
2.9.2	Humidity conditioning	Humidity treatment performed for 120h.	**P**
	Relative humidity (%), temperature (°C) ..... :	95%, 40°C.	**—**
2.9.3	Grade of insulation	Insulation is considered to be functional, basic, supplementary, reinforced or double insulation.	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
2.9.4	Separation from hazardous voltages	The accessible conductive parts, including SELV circuits and their related windings, are separated from parts at hazardous voltage by double insulation or reinforced insulation.	P
	Method(s) used ..... :	Method 1 is used.	—
2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	Refer below	—
2.10.1.1	Frequency ..... :	Considered.	P
2.10.1.2	Pollution degrees ..... :	The equipment is considered located within pollution degree II.	P
2.10.1.3	Reduced values for functional insualtion	The functional are comply with 5.3.4 a) and c)	P
2.10.1.4	Intervening unconnected conductive parts	Considered.	P
2.10.1.5	Insulation with varying dimensions	No such insulations.	N
2.10.1.6	Special separation requirements	Not used.	N
2.10.1.7	Insulation in circuits generating starting pulses	No such circuits.	N
2.10.2	Determination of working voltage	Refer below:	P
2.10.2.1	General	Considered.	P
2.10.2.2	RMS working voltage	(see appended table 2.10.2)	P
2.10.2.3	Peak working voltage	(see appended table 2.10.2)	P
2.10.3	Clearances	Refer below:	P
2.10.3.1	General	Considered.	P
2.10.3.2	Mains transient voltages	Refer below:	P
	a) AC mains supply ..... :	Equipment is Overvoltage Category II.	P
	b) Earthed d.c. mains supplies ..... :	Not intended for d.c.	N
	c) Unearthed d.c. mains supplies ..... :	Not intended for d.c.	N
	d) Battery operation ..... :	No battery in the equipment.	N
2.10.3.3	Clearances in primary circuits	(see appended table 2.10.3 and 2.10.4)	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.3.4	Clearances in secondary circuits	Only the functional insulation in secondary circuits complied with clause 5.3.4.	N
2.10.3.5	Clearances in circuits having starting pulses	No such circuits.	N
2.10.3.6	Transients from a.c. mains supply ..... :	Considered.	P
2.10.3.7	Transients from d.c. mains supply ..... :	Not connected to d.c. mains supply.	N
2.10.3.8	Transients from telecommunication networks and cable distribution systems ..... :	No TNV circuits in the equipment.	N
2.10.3.9	Measurement of transient voltage levels	Measurement not relevant.	N
	a) Transients from a mains suplply		N
	For an a.c. mains supply ..... :		N
	For a d.c. mains supply ..... :		N
	b) Transients from a telecommunication network :		N
2.10.4	Creepage distances	(see appended table 2.10.3 and 2.10.4)	P
2.10.4.1	General	Refer below:	P
2.10.4.2	Material group and comparative tracking index	Material group IIIa and IIIb are used.	P
	CTI tests ..... :	CTI rating for all material of minimum 100.	—
2.10.4.3	Minimum creepage distances	(see appended table 2.10.3 and 2.10.4)	P
2.10.5	Solid insulation	Considered.	P
2.10.5.1	General	Refer below:	P
2.10.5.2	Distances through insulation	(see appended table 2.10.5)	P
2.10.5.3	Insulating compound as solid insulation	For optocouplers, see appended table 1.5.1.	P
2.10.5.4	Semiconductor devices	No such components.	N
2.10.5.5.	Cemented joints	No cemented joints.	N
2.10.5.6	Thin sheet material – General	Refer below:	P
2.10.5.7	Separable thin sheet material	Refer to Annex C and appended table 2.10.5	P
	Number of layers (pcs)..... :		—
2.10.5.8	Non-separable thin sheet material	Not such parts.	N

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.9	Thin sheet material – standard test procedure	Refer to sub. clause 2.10.5.10.	N
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure	(see appended table 2.10.5)	P
	Electric strength test	(see appended table 2.10.5)	P
2.10.5.11	Insulation in wound components	Not used.	N
2.10.5.12	Wire in wound components	Insulation on secondary wnding wires of T2 (type 8TA00327) complies with Annex U.	P
	Working voltage .....:		N
	a) Basic insulation not under stress .....:		N
	b) Basic, supplemetary, reinforced insulation .....:		N
	c) Compliance with Annex U .....:		P
	Two wires in contact inside wound component; angle between 45° and 90° .....:	Protection against mechanical stress is provided by tube.	P
2.10.5.13	Wire with solvent-based enamel in wound components	No such parts.	N
	Electric strength test		—
	Routine test		—
2.10.5.14	Additional insulation in wound components	No additional insulation used.	N
	Working voltage .....:		—
	- Basic insulation not under stress .....:		—
	- Supplemetary, reinforced insulation .....:		—
2.10.6	Construction of printed boards	Refer below:	P
2.10.6.1	Uncoated printed boards	Considered. (see appended table 2.10.3 and 2.10.4)	P
2.10.6.2	Coated printed boards	No such parts.	N
2.10.6.3	Insulation between conductors on the same inner surface of a printed board	No such parts.	N
2.10.6.4	Insulation between conductors on different layers of a printed board	No such parts.	N
	Distance through insulation		—
	Number of insulation layers (pcs) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.7	Component external terminations	No such parts.	**N**
2.10.8	Tests on coated printed boards and coated components	No such parts.	**N**
2.10.8.1	Sample preparation and preliminary inspection		**N**
2.10.8.2	Thermal conditioning		**N**
2.10.8.3	Electric strength test		**N**
2.10.8.4	Abrasion resistance test		**N**
2.10.9	Thermal cycling	For optocouplers, see appended table 1.5.1	**P**
2.10.10	Test for Pollution Degree 1 environment and insulating compound	For optocouplers, see appended table 1.5.1	**P**
2.10.11	Tests for semiconductor devices and cemented joints	No such device used.	**N**
2.10.12	Enclosed and sealed parts	For optocouplers, see appended table 1.5.1	**P**

3	WIRING, CONNECTIONS AND SUPPLY		**P**
3.1	General		**P**
3.1.1	Current rating and overcurrent protection	Adequate cross sectional areas on internal wiring.	**P**
3.1.2	Protection against mechanical damage	Wireways are smooth and free from edges. Wires are adequately fixed to prevent excessive strain on wire and terminals and avoiding damage to the insulation of the conductors.	**P**
3.1.3	Securing of internal wiring	Internal wiring is secured against excessive strain, loosening of terminals and damage to the conductor insulation.	**P**
3.1.4	Insulation of conductors	Insulation on internal conductors is considered to be of adequate quality and suitable for the application and the working voltage involved.	**P**
3.1.5	Beads and ceramic insulators	No beads or similar ceramic insulators on conductors.	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
3.1.6	Screws for electrical contact pressure	Electrical screw connection is only connecting protective earth to chassis. Metal screw engages more than 2 threads. Screws made of insulating material are not used where electrical connections, including protective earthing are involved.	**P**
3.1.7	Insulating materials in electrical connections	No contact pressure through insulating material.	**N**
3.1.8	Self-tapping and spaced thread screws	Thread-cutting or space thread screws are not used for electrical connections.	**N**
3.1.9	Termination of conductors	Terminations cannot become displaced so that clearances and creepage distances can be reduced.	**P**
	10 N pull test	Considered.	**P**
3.1.10	Sleeving on wiring	Sleeves can only be removed by breaking or cutting.	**P**
3.2	Connection to a mains supply		**P**
3.2.1	Means of connection	Refer below:	**P**
3.2.1.1	Connection to an a.c. mains supply	The equipment is provided with an appliance inlet.	**P**
3.2.1.2	Connection to a d.c. mains supply	The equipment is not for connection to a d.c. mains supply.	**N**
3.2.2	Multiple supply connections	Only one supply connection.	**N**
3.2.3	Permanently connected equipment	The equipment is not intended for permanent connection to the mains.	**N**
	Number of conductors, diameter of cable and conduits (mm) ..... :		**—**
3.2.4	Appliance inlets	The appliance inlet complies with IEC 60320-1 and is properly placed to avoid hazards after insertion of the appliance coupler.	**P**
3.2.5	Power supply cords	Refer below:	**—**

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Clause	Requirement + Test	Result - Remark	Verdict
3.2.5.1	AC power supply cords	Power supply cord is not provided with the equipment, refer to Summary of Testing.	N
	Type ..... :		—
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
3.2.5.2	DC power supply cords	AC supplied, not connected to DC supply.	N
3.2.6	Cord anchorages and strain relief	Equipment provided with an appliance inlet.	N
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage	Equipment provided with an appliance inlet.	N
3.2.8	Cord guards	The equipment is neither hand-held nor intended to be moved during operation.	N
	Diameter or minor dimension D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm)..... :		—
3.2.9	Supply wiring space	Equipment provided with an appliance inlet.	P

3.3	Wiring terminals for connection of external conductors		N
3.3.1	Wiring terminals	3.3.1 – 3.3.8; Appliance inlet provided.	N
3.3.2	Connection of non-detachable power supply cords		N
3.3.3	Screw terminals		N
3.3.4	Conductor sizes to be connected		N
	Rated current (A), cord/cable type, cross-sectional area (mm^2)..... :		—
3.3.5	Wiring terminal sizes		N
	Rated current (A), type, nominal thread diameter (mm) ..... :		—
3.3.6	Wiring terminal design		N
3.3.7	Grouping of wiring terminals		N

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Clause	Requirement + Test	Result - Remark	Verdict
3.3.8	Stranded wire		N
3.4	Disconnection from the mains supply		P
3.4.1	General requirement	See Sub-clause 3.4.2.	—
3.4.2	Disconnect devices	The appliance coupler will be acting as disconnect device.	P
3.4.3	Permanently connected equipment	Not permanently connected equipment.	N
3.4.4	Parts which remain energized	No parts remain energized after the disconnect device is pulled out.	P
3.4.5	Switches in flexible cords	Power cord set is not considered.	N
3.4.6	Number of poles - single-phase and d.c. equipment	The disconnect device disconnects both poles simultaneously.	P
3.4.7	Number of poles - three-phase equipment	Single phase equipment.	N
3.4.8	Switches as disconnect devices	No such switches used.	N
3.4.9	Plugs as disconnect devices	The appliance coupler will be regarded as disconnect device, no warning is required.	P
3.4.10	Interconnected equipment	No interconnections using hazardous voltages.	N
3.4.11	Multiple power sources	One power source only.	N
3.5	Interconnection of equipment		P
3.5.1	General requirements	Considered.	P
3.5.2	Types of interconnection circuits ..... :	SELV circuit and limited current circuit.	—
3.5.3	ELV circuits as interconnection circuits	No ELV interconnections.	N
3.5.4	Data ports for additional equipment	No data ports.	N
4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N
	Angle of 10°	Build-in component, to be evaluated in the end product.	N

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Clause	Requirement + Test	Result - Remark	Verdict
	Test force (N) .....:		N
4.2	Mechanical strength		P
4.2.1	General	Considered.	P
4.2.2	Steady force test, 10 N	No hazard, ref. comment in table 2.10.	P
4.2.3	Steady force test, 30 N	No hazard. The test are performed on all sides of metal enclosure except inlet side.	P
4.2.4	Steady force test, 250 N	Applied at side of appliance inlet (per client request), other sides must be evaluated in the final system.	—
4.2.5	Impact test	Refer below:	—
	Fall test	No hazard as result from the steel sphere fall test on appliance inlet side. (Per client requested)	P
	Swing test	No hazard as result from the steel sphere swing test on appliance inlet side. (Per client requested)	P
4.2.6	Drop test; height (mm) .....:	Drop test not applicable.	N
4.2.7	Stress relief test	Must be taken care in the end product.	—
4.2.8	Cathode ray tubes	CRT(s) not used in the equipment.	N
	Picture tube separately certified .....:		—
4.2.9	High pressure lamps	No high pressure lamps in the equipment.	N
4.2.10	Wall or ceiling mounted equipment; force (N) .....:	Not intended to be mounted on a wall or ceiling.	N
4.3	Design and construction		P
4.3.1	Edges and corners	All edges and corners are rounded and/or smoothed.	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.2	Handles and manual controls; force (N) ..... :	Build-in component, to be evaluated in the end product.	N
4.3.3	Adjustable controls	No hazardous adjustable controls.	N
4.3.4	Securing of parts	No loosening of parts impairing creepage distances or clearances is likely to occur.	P
4.3.5	Connection by plugs and sockets	SELV connectors do not comply with IEC 60320-1 or IEC 60083.	P
4.3.6	Direct plug-in equipment	Not intended to plug directly into a wall socket-outlet.	N
	Torque .....:		—
	Compliance with the relevant mains plug standard .....:		—
4.3.7	Heating elements in earthed equipment	No heating elements provided.	N
4.3.8	Batteries	No batteries in the equipment.	N
	- Overcharging of a rechargeable battery		—
	- Unintentional charging of a non-rechargeable battery		—
	- Reverse charging of a rechargeable battery		—
	- Excessive discharging rate for any battery		—
4.3.9	Oil and grease	Insulation is not exposed to oil, grease etc.	N
4.3.10	Dust, powders, liquids and gases	The equipment does not contain flammable liquids or gases.	N
4.3.11	Containers for liquids or gases	No containers for liquids or gases in the equipment.	N
4.3.12	Flammable liquids .....:	The equipment does not contain flammable liquid.	N
	Quantity of liquid (l) .....:		—
	Flash point (°C) .....:		—
4.3.13	Radiation	Refer below:	N
4.3.13.1	General	Refer below:	—

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.13.2	Ionizing radiation	The equipment does not generate ionizing radiation.	N
	Measured radiation (pA/kg) .....:		—
	Measured high-voltage (kV) .....:		—
	Measured focus voltage (kV) .....:		—
	CRT markings .....:		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials	The equipment does not produce significant UV radiation.	N
	Part, property, retention after test, flammability classification .....:		—
4.3.13.4	Human exposure to ultraviolet (UV) radiation .....:	The equipment does not produce significant UV radiation.	N
4.3.13.5	Laser (including LEDs)	No laser or LED.	N
	Laser class .....:		—
4.3.13.6	Other types .....:	The equipment does not generate other types of radiation.	N
4.4	Protection against hazardous moving parts		P
4.4.1	General	Adequate protection against risk of personal injury.	P
4.4.2	Protection in operator access areas .....:	No moving parts except DC fan which are properly guarded.	P
4.4.3	Protection in restricted access locations .....:	Not intended for installation in RAL.	N
4.4.4	Protection in service access areas	Unintentional contact is not likely in service access areas.	P
4.5	Thermal requirements		P
4.5.1	General		P
4.5.2	Temperature tests	(see appended table 4.5)	P
	Normal load condition per Annex L .....:		—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.5.4	Touch temperature limits	(see appended table 4.5)	P
4.5.5	Resistance to abnormal heat .....:	No thermoplastic parts carrying hazardous voltages.	N
4.6	Openings in enclosures		N
4.6.1	Top and side openings	Must be taken care in the end product.	N
	Dimensions (mm) .....:		—
4.6.2	Bottoms of fire enclosures	Must be taken care in the end product.	N
	Construction of the bottomm, dimensions (mm) ..:		—
4.6.3	Doors or covers in fire enclosures	No doors or covers in the enclosure.	N
4.6.4	Openings in transportable equipment	Must be taken care in the end product.	N
4.6.4.1	Constructional design measures		N
	Dimensions (mm) .....:		—
4.6.4.2	Evaluation measures for larger openings		N
4.6.4.3	Use of metallized parts		N
4.6.5	Adhesives for constructional purposes	No barrier secured by adhesive inside enclosure.	N
	Conditioning temperature (°C), time (weeks).....:		—
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Method 1 is used.	P
	Method 1, selection and application of components wiring and materials	(see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests		N
4.7.2	Conditions for a fire enclosure	Refer below:	—
4.7.2.1	Parts requiring a fire enclosure	Must be taken care in the end product.	N
4.7.2.2	Parts not requiring a fire enclosure	Must be taken care in the end product.	N
4.7.3	Materials	Refer below:	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.7.3.1	General	Components and materials have adequate flammability classification. See appended table 1.5.1.	**P**
4.7.3.2	Materials for fire enclosures	Must be taken care in the end product.	**N**
4.7.3.3	Materials for components and other parts outside fire enclosures	Equipment for building-in. Must be considered in the end product.	**N**
4.7.3.4	Materials for components and other parts inside fire enclosures	Other materials inside the enclosure are minimum V-2 material.	**P**
4.7.3.5	Materials for air filter assemblies	No air filters in the equipment.	**N**
4.7.3.6	Materials used in high-voltage components	No parts exceeding 4kV.	**N**
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		**P**
5.1	Touch current and protective conductor current		**P**
5.1.1	General	Test conducted in accordance with 5.1.2 to 5.1.7.	**P**
5.1.2	Configuration of equipment under test (EUT)	Refer below:	**P**
5.1.2.1	Single connection to an a.c. mains supply	No interconnected of equipment.	**N**
5.1.2.2	Redundant multiple connections to an a.c. mains supply	No multiple power sources.	**N**
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply	No multiple power sources.	**N**
5.1.3	Test circuit	Tested for connection to IT power distribution system (also relevant for TN or TT power distribution system).	**—**
5.1.4	Application of measuring instrument	Measuring instrument D1 is used.	**—**
5.1.5	Test procedure	Considered.	**—**
5.1.6	Test measurements	Measuring instrument D1 is used.	**—**
	Supply voltage (V) .....:	264V	**—**
	Measured touch current (mA) .....:	(See appended table 5.1)	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
	Max. allowed touch current (mA) .....:	3.5 and 0.25	—
	Measured protective conductor current (mA) .....:		N
	Max. allowed protective conductor current (mA)...:		—
5.1.7	Equipment with touch current exceeding 3,5 mA	The touch current does not exceed 3.5mA.	N
5.1.7.1	General .....:		—
5.1.7.2	Simultaneous multiple connections to the supply		—
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks	Not connected to a telecommunication network nor cable distribution systems.	N
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		—
	Supply voltage (V) .....:		—
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
5.1.8.2	Summation of touch currents from telecommunication networks	Not connected to a telecommunication network.	N
	a) EUT with earthed telecommunication ports .....:		—
	b) EUT whose telecommunication ports have no reference to protective earth		—
5.2	Electric strength		P
5.2.1	General	(see appended table 5.2)	P
5.2.2	Test procedure	(see appended table 5.2)	P
5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors	No excessive temperatures occur when fan motor is stalled.	P
5.3.3	Transformers	See appended Annex C.	P
5.3.4	Functional insulation.....:	Complies with a) and c).	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.5	Electromechanical components	No electromechanical components in secondary circuits.	N
5.3.6	Audio amplifiers in ITE .....:	No audio amplifiers inside equipment.	N
5.3.7	Simulation of faults	See the enclosed fault condition tests.	P
5.3.8	Unattended equipment	No thermostats, temperature limiters or thermal cut-outs	N
5.3.9	Compliance criteria for abnormal operating and fault conditions	Refer below:	P
5.3.9.1	During the tests	No fire or molten metal occurred and no deformation of enclosure during the tests.	P
5.3.9.2	After the tests	No reduction of clearance and creepage distances. Electric strength test is made on basic, supplementary and reinforced insulation.	P
6	CONNECTION TO TELECOMMUNICATION NETWORKS		N
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment	6.1-6.1.2.2: No TNV circuits.	N
6.1.1	Protection from hazardous voltages		N
6.1.2	Separation of the telecommunication network from earth		N
6.1.2.1	Requirements		N
	Supply voltage (V) .....:		—
	Current in the test circuit (mA) .....:		—
6.1.2.2	Exclusions .....:	No TNV circuits.	N
6.2	Protection of equipment users from overvoltages on telecommunication networks		N
6.2.1	Separation requirements	6.2.1-6.2.2.3: No TNV circuits.	N
6.2.2	Electric strength test procedure		N
6.2.2.1	Impulse test		N
6.2.2.2	Steady-state test		N

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.2.3	Compliance criteria		N
6.3	Protection of the telecommunication wiring system from overheating		N
	Max. output current (A) .....:		—
	Current limiting method .....:		—
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N
7.1	General	7.1-7.4.3: Not connected to cable distribution systems.	N
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N
7.3	Protection of equipment users from overvoltages on the cable distribution system		N
7.4	Insulation between primary circuits and cable distribution systems		N
7.4.1	General		N
7.4.2	Voltage surge test		N
7.4.3	Impulse test		N
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)	Refer below:	N
A.1.1	Samples ..... :	Product mass <18kg	N
	Wall thickness (mm)..... :		—
A.1.2	Conditioning of samples; temperature (°C) ..... :		N
A.1.3	Mounting of samples ..... :		N
A.1.4	Test flame (see IEC 60695-11-3)		N
	Flame A, B, C or D ..... :		—
A.1.5	Test procedure		N
A.1.6	Compliance criteria		N
	Sample 1 burning time (s)..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Sample 2 burning time (s)..... :		—
	Sample 3 burning time (s)..... :		—
A.2	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N
A.2.1	Samples, material ..... :	All materials have suitable flame class, no testing required, must be taken care in the end product.	N
	Wall thickness (mm)..... :		—
A.2.2	Conditioning of samples; temperature (°C) ..... :		N
A.2.3	Mounting of samples ..... :		N
A.2.4	Test flame (see IEC 60695-11-4)		N
	Flame A, B or C ..... :		—
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s)..... :		—
	Sample 2 burning time (s)..... :		—
	Sample 3 burning time (s)..... :		—
A.2.7	Alternative test acc. to IEC 60695-11-5, cl. 5 and 9		N
	Sample 1 burning time (s)..... :		—
	Sample 2 burning time (s)..... :		—
	Sample 3 burning time (s)..... :		—
A.3	Hot flaming oil test (see 4.6.2)		N
A.3.1	Mounting of samples		N
A.3.2	Test procedure		N
A.3.3	Compliance criterion		N
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		P
B.1	General requirements	Fan are separately certified, see list of critical components.	P
	Position ..... :	Cooling fan, supplied by SELV voltage.	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Manufacturer ..... :	See list of critical components.	—
	Type ..... :	See list of critical components.	—
	Rated values ..... :	12Vdc	—
B.2	Test conditions		N
B.3	Maximum temperatures		N
B.4	Running overload test		N
B.5	Locked-rotor overload test		N
	Test duration (days) ..... :		—
	Electric strength test: test voltage (V) ..... :		—
B.6	Running overload test for d.c. motors in secondary circuits		N
B.6.1	General		N
B.6.2	Test procedure		N
B.6.3	Alternative test procedure		N
B.6.4	Electric strength test; test voltage (V) ..... :		N
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N
B.7.1	General		N
B.7.2	Test procedure		N
B.7.3	Alternative test procedure		N
B.7.4	Electric strength test; test voltage (V) ..... :		N
B.8	Test for motors with capacitors		N
B.9	Test for three-phase motors		N
B.10	Test for series motors		N
	Operating voltage (V) ..... :		—

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position ..... :	Primary to SELV.	—
	Manufacturer ..... :	(see appended table 1.5.1)	—
	Type ..... :	(see appended table 1.5.1)	—
	Rated values ..... :	(see appended table 1.5.1)	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Method of protection ..... :	Inherent impedance.	—
C.1	Overload test	(see appended table 5.3)	P
C.2	Insulation	The reinforced insulation fulfil the requirement in Sub-clause 2.10 and relevant tests of Sub-clause 5.2.2	P
	Protection from displacement of windings ..... :	Secured by tubing and insulation tape. (see appended table C.2)	P
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
D.1	Measuring instrument	Figure D.1 used.	P
D.2	Alternative measuring instrument		N
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		P
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1	Clearances		N
G.1.1	General		N
G.1.2	Summary of the procedure for determining minimum clearances		N
G.2	Determination of mains transient voltage (V)		N
G.2.1	AC mains supply ..... :		N
G.2.2	Earthed d.c. mains supplies ..... :		N
G.2.3	Unearthed d.c. mains supplies ..... :		N
G.2.4	Battery operation ..... :		N
G.3	Determination of telecommunication network transient voltage (V) ..... :		N
G.4	Determination of required withstand voltage (V)		N
G.4.1	Mains transients and internal repetitive peaks .... :		N
G.4.2	Transients from telecommunication networks ..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
G.4.3	Combination of transients		N
G.4.4	Transients from cable distribution systems		N
G.5	Measurement of transient voltages (V)		N
	a) Transients from a mains supply		—
	For an a.c. mains supply		—
	For a d.c. mains supply		—
	b) Transients from a telecommunication network		—
G.6	Determination of minimum clearances .....:		N
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		P
	Metal(s) used .....:		—
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N
K.1	Making and breaking capacity		N
K.2	Thermostat reliability; operating voltage (V) .....:		N
K.3	Thermostat endurance test; operating voltage (V) .....:		N
K.4	Temperature limiter endurance; operating voltage (V) .....:		N
K.5	Thermal cut-out reliability		N
K.6	Stability of operation		N
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		N
L.1	Typewriters		N
L.2	Adding machines and cash registers		N
L.3	Erasers		N
L.4	Pencil sharpeners		N
L.5	Duplicators and copy machines		N
L.6	Motor-operated files		N

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Clause	Requirement + Test	Result - Remark	Verdict
L.7	Other business equipment		N
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N
M.3.1	Ringing signal		N
M.3.1.1	Frequency (Hz) ..... :		—
M.3.1.2	Voltage (V) ..... :		—
M.3.1.3	Cadence; time (s), voltage (V) ..... :		—
M.3.1.4	Single fault current (mA) ..... :		—
M.3.2	Tripping device and monitoring voltage ..... :		N
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2	Tripping device		N
M.3.2.3	Monitoring voltage (V) ..... :		N
N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N
N.1	ITU-T impulse test generators		N
N.2	IEC 60065 impulse test generator		N
P	ANNEX P, NORMATIVE REFERENCES		P
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		P
	a) Preferred climatic categories ..... :		P
	b) Maximum continuous voltage ..... :		P
	c) Pulse current ..... :		P
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N

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Clause	Requirement + Test	Result - Remark	Verdict
R.2	Reduced clearances (see 2.10.3)		N
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N
S.1	Test equipment		N
S.2	Test procedure		N
S.3	Examples of waveforms during impulse testing		N
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		P
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction	See below	P
V.2	TN power distribution systems	See sub-clause 1.6.1	P
W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N
W.1	Touch current from electronic circuits		N
W.1.1	Floating circuits		N
W.1.2	Earthed circuits		N
W.2	Interconnection of several equipments		N
W.2.1	Isolation		N
W.2.2	Common return, isolated from earth		N
W.2.3	Common return, connected to protective earth		N
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		P
X.1	Determination of maximum input current	See Annex C.1	P
X.2	Overload test procedure	Electronic protection mode is used.	P
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N

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Clause	Requirement + Test	Result - Remark	Verdict
Y.1	Test apparatus .....:		N
Y.2	Mounting of test samples .....:		N
Y.3	Carbon-arc light-exposure apparatus .....:		N
Y.4	Xenon-arc light exposure apparatus .....:		N
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		P
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N
BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—

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Clause	Requirement + Test	Result - Remark	Verdict

EN 60950-1:2006, A11 – CENELEC COMMON MODIFICATIONS		
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	**P**
General	Delete all the “country” notes in the reference document according to the following list: 1.4.8 Note 2; 1.5.1 Note 2 & 3; 1.5.7.1 Note 1.5.8 Note 2; 1.5.9.4 Note; 1.7.2.1 Note 4, 5 & 6 2.2.3 Note; 2.2.4 Note; 2.3.2 Note 2.3.2.1 Note 2; 2.3.4 Note 2; 2.6.3.3 Note 2 & 3 2.7.1 Note; 2.10.3.2 Note 2; 2.10.5.13 Note 3 3.2.1.1 Note; 3.2.4 Note 3.; 2.5.1 Note 2 4.3.6 Note 1 & 2; 4.7 Note 4; 4.7.2.2 Note 4.7.3.1 Note 2; 5.1.7.1 Note 3 & 4; 5.3.7 Note 1 6 Note 2 & 5; 6.1.2.1 Note 2; 6.1.2.2 Note 6.2.2 Note 6.; 2.2.1 Note 2; 6.2.2.2 Note 7.1 Note 3; 7.2 Note; 7.3 Note 1 & 2 G.2.1 Note 2; Annex H Note 2	**P**
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for “one package equipment”, and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.	**N**
1.5.1	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC	**N**
1.7.2.1	Add the following NOTE: NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss	**N**

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Clause	Requirement + Test	Result - Remark	Verdict

2.7.1	Replace the subclause as follows: Basic requirements To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.	**P**
2.7.2	This subclause has been declared 'void'.	**N**
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.	**P**
3.2.5.1	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: | Up to and including 6 | | 0,75 [a)] | | Over 6 up to and including 10 | (0,75) [b)] | 1,0 | | Over 10 up to and including 16 | (1,0) [c)] | 1,5 | In the conditions applicable to Table 3B delete the words "in some countries" in condition [a)]. In NOTE 1, applicable to Table 3B, delete the second sentence.	**N**
3.3.4	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: | Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | Delete the fifth line: conductor sizes for 13 to 16 A.	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.13.6	Add the following NOTE: NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		**N**
Annex H	Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.		**N**
Biblio-graphy	Additional EN standards.		**—**
ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		**—**
ZB	SPECIAL NATIONAL CONDITIONS		**P**
1.2.4.1	In **Denmark**, certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.		**N**
1.2.13.14	In **Norway** and **Sweden**, for requirements see 1.7.2.1 and 7.3 of this annex.		**N**
1.5.7.1	In **Finland, Norway** and **Sweden**, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.		**N**
1.5.8	In **Norway**, due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).		**P**
1.5.9.4	In **Finland**, **Norway** and **Sweden**, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		**N**

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Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1	In **Finland**, **Norway** and **Sweden**, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan" In Norway: “Apparatet må tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag” In **Norway** and **Sweden**, the screen of the cable 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 need 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 e.g. a retailer. 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: “Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore 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 installations of cable distribution systems, 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): “Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet.” Translation to Swedish: ”Utrustning 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 utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.”		N

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Clause	Requirement + Test	Result - Remark	Verdict

1.7.5	In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a. For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.	**N**
2.2.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	**N**
2.3.2	In **Finland**, **Norway** and **Sweden** there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.	**N**
2.3.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	**N**
2.6.3.3	In the **United Kingdom**, the current rating of the circuit shall be taken as 13 A, not 16 A.	**P**
2.7.1	In the **United Kingdom**, to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.	**N**
2.10.5.13	In **Finland**, **Norway** and **Sweden**, there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.	**N**
3.2.1.1	In **Switzerland**, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998 Plug Type 25 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998 Plug Type 21 L+N 250 V, 16 A SEV 5934-2.1998 Plug Type 23 L+N+PE 250 V, 16 A	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.		**N**
3.2.1.1	In **Spain**, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.		**N**
3.2.1.1	In the **United Kingdom**, apparatus 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 and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, 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**
3.2.1.1	In **Ireland**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.		**N**
3.2.4	In **Switzerland**, for requirements see 3.2.1.1 of this annex.		**N**
3.2.5.1	In the **United Kingdom**, a power supply cord with conductor of 1,25 mm2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.		**N**
3.3.4	In the **United Kingdom**, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.		**N**

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.6	In the **United Kingdom**, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and 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**
4.3.6	In **Ireland**, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.		**N**
5.1.7.1	In **Finland**, **Norway** and **Sweden** TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		**N**

Nemko

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Clause	Requirement + Test	Result - Remark	Verdict
6.1.2.1	In **Finland**, **Norway** and **Sweden**, add the following text between the first and second paragraph of the compliance clause: 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 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2. A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400.		**N**
6.1.2.2	In **Finland**, **Norway** and **Sweden**, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.		**N**
7.2	In **Finland**, **Norway** and **Sweden**, for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		**N**

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Clause	Requirement + Test	Result - Remark	Verdict

7.3	In **Norway** and **Sweden**, for requirements see 1.2.13.14 and 1.7.2.1 of this annex.	**N**
7.3	In **Norway**, for installation conditions see EN 60728-11:2005.	**N**

ZC	A-DEVIATIONS (informative)	**P**
1.5.1	**Sweden** (Ordinance 1990:944) Add the following: NOTE In Sweden, switches containing mercury are not permitted.	**N**
1.5.1	**Switzerland** (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.	**N**
1.7.2.1	**Denmark** (Heavy Current Regulations) Supply cords of CLASS I EQUIPMENT, which is delivered without a plug, must be provided with a visible tag with the following text: Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket  eller  If essential for the safety of the equipment, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text: “For tilslutning af de øvrige ledere, se medfølgende installationsvejledning.”	**N**
1.7.2.1	**Germany** (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2). If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.	**P**
1.7.5	**Denmark** (Heavy Current Regulations) With the exception of CLASS II EQUIPMENT provided with a socket outlet in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-4a, CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
1.7.13	**Switzerland** (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries.		**N**
5.1.7.1	**Denmark** (Heavy Current Regulations, Chapter 707, clause 707.4) TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B.		**N**

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1.5.1	TABLE: List of critical components	P

Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
Enclosure	Various	Various	Metal, 0.8 mm min. thick		Tested in the equip.
PCBs	Various	Various	Min. V-1, min. 130°C	UL 796	UL
Appliance inlet	Rong Feng Supercom Solteam Yue Qing Beierjia Canal TECX-UNION	SS-7B, SS-120 SC-9 ST-01 ST-A01 series KS-series TU-301- series	10A, 250V min. 65°C	EN 60320-1, UL 498	VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL
Power switch (Optional)	Jackson Rong Feng Legion Pronic Rong Feng Canal Canal Zhang Jiagang Hua-Feng Solteam Canal Solteam Solteam	JS-608-R RF-1003 Serie SS21 R 22 RF-1004 MR Series MR6 Series HF 606xx Serie MR-21 MR-2 series OR-L Serie OR-P Serie	16A, 250V 10(4)A, 250V 12(4)A, 250V 16(4)A, 250V 16(4)A, 250V 10(4)A, 250V 16(8)A, 250V 10/6A, 125/250V 10A, 250V 10(4)A, 250V 6A, 250V 6A, 250V	IEC 61058-1, UL 1054	VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL
Discharge Resistor (RX4) ***1), 2)***	KOA Pilkor Uniroyal Uniroyal Uniroyal Uniroyal	RCR 50EN-series RCR 60 MSR 37 MGR0W4Jxxxx A50 MGR0W2Jxxxx A10 MGR01WJxxxx A10 MGR02WJxxxx AA0	2.2MΩ or 3.3MΩ, 1/2W 2.2MΩ or 3.3MΩ, 1W 2.2MΩ or 3.3MΩ, 1/2W 2.2MΩ or 3.3MΩ, 1/4W 2.2MΩ or 3.3MΩ, 1/2W 2.2MΩ or 3.3MΩ, 1W 2.2MΩ or 3.3MΩ, 2W (Located before fuse)	DIN EN 60065 (VDE 0860) : ed.7 clause 14.1 a)	VDE VDE VDE VDE VDE VDE VDE
Fuse (F1)	Littelfuse Walter	215-xxx TSC	T10A, 250V	IEC 60127 (VDE), UL 248 (UL)	VDE, UL UL

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Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
X-cap. (CX1, CX3, CX4) (Optional) ***1), 2)***	Pilkor Taishing Matsushita Matsushita Matsushita Iskra Iskra Iskra Iskra Vishay Vishay Okaya Okaya UTX Teapo Thomson Chiefcon Rifa Rifa Hua Jung Cheng Tung Arcotronics Arcotronics Carli Teapo Shiny Space ZhuHai Sung Ho	PCX2 335M MPX ECQUL ECQ-UV ECQUG KNB1530 KNB1560 KNB1562 KNB1563 F1772-xxx-xxxx F1778-xxx-x2xxxx RE-Series, PA LE series HQX XG-VP, XG-VS QX CKX PHE 830M PHE 840 M MKP CTX R46 series Series R49 MPX XG-V SX1 CMPP	CX1= max. 0.68µF, CX3= max. 0.47µF CX4= max. 0.22µF or 0.33µF min. 250V, min. 85°C	IEC 60384-14 2ed. With 21 days damp heat test , UL 1414	VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL S, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL ENEC by IMQ, UL ENEC by IMQ, UL VDE, UL VDE, UL VDE, UL VDE, UL
Y-cap. (CY1, CY2, CY5, CY6) (Optional) ***1)***	Matsushita Murata Walsin Sam Hwa Welson TDK Samsung Iskra Success Success Success Arcotronics Chyun Fuh Vishay Holy Stone Holy Stone	NS-A, TS KX, KH AC, AH SC WD CS, CD AA, AD KNB2520 SE SF SB Series R41 CE VY1, VY2 SDCE series SDCY series	CY1=CY2= max. 2200pF, CY5=CY6= max. 1000pF, min. 250V, min. 85°C	IEC 60384-14 2ed., UL 1414	VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL ENCE by IMQ VDE, UL VDE, UL TUV, UL TUV, UL

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Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
Line choke (L4, L5) (Optional) (No bobbin)	SPI/FSP SPI/FSP	8LM00771 8LM01468	105°C		Tested in the unit
Discharge Resistor (RX1, RX2)	Various	Various	470kΩ, 1/4W (Located after fuse, two in series.)		Tested in the unit
Choke (L1, L3) (Optional) (No bobbin)	SPI/FSP SPI/FSP SPI/FSP	8LM01414 8LM01461 8LM01802	120°C		Tested in the unit
Varistor (RV1) (Optional) *)	Thinking Thinking Thinking Thinking Thinking Thinking Thinking Centra Science Uppermost	TVR10471-V TVR10471-D TVR10471-K TVR14D471 TVR14471 TVR14471-D TVR14471D CNR-14D471K V14K300	300 Vac min (located after fuse and not connected between pri. and PE)	CECC 42200, IEC 61051-1, IEC 61051-2, UL 1449 3rd., UL 1414, CSA 22.2 No. 1	VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL
Bridge diode (BD1, BD2)	Various	Various	Min. 6A, min. 600V.		Tested in the unit
Line choke (L10) (Optional) (No bobbin)	SPI/FSP SPI/FSP SPI/FSP	8LA00184 8LA00197 8LM02100	105°C		Tested in the unit
MOSFET (Q10, Q11)	Various	Various	Min. 18A min. 500V		Tested in the unit
Thermistor (RT11)	Various	Various	Min. 5A, 1.5Ω at 25°C		Tested in the unit
Storage capacitor (C10)	Various	Various	270-330µF min. 400Vdc, min. 85°C		Tested in the unit
Inductor (T3) -Bobbin	SPI/FSP Chang Chun	8TA00076 T375J	105°C V-0, 130°C, phenolic	 UL 94	Tested in the unit UL
MOSFET (Q60, Q61)	Various	Various	Min. 18A min. 500V		Tested in the unit
Current sense resistor (R69)	Various	Various	3W, Min. 0.15Ω		Tested with the unit

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Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
Optocoupler (M2, M3, M5)	Sharp Lite-On Everlight Bright Led Bright Led Bright Led	PC123 LTV-817 EL817. BPC-817 BPC-817S BPC-817M	See appended opto electronic devices, min. 100°C	IEC 60950-1, UL 1577	FI, UL FI, UL FI, UL S, UL S, UL S, UL
Y-cap. (CY8) (Y1 type) (Optional)	Matsushita Walsin TDK Success Success Holy Stone Vishay	NS-A AH CD SE SB SDCE series VY1	max. 3300pF, min. 250V, min. 85°C	IEC 60384-14 2ed., UL 1414	VDE, UL VDE, UL VDE, UL VDE, UL VDE, UL TUV, UL VDE, UL
Transformer (T1) ***3)***	SPI/FSP	8TG00192	Class B ***4)***	IEC 60950-1 and evaluated acc. To IEC 60085	Ref. Annex C
Transformer (T2) ***3)***	SPI/FSP	8TC00207	Class B ***4)***	IEC 60950-1 and evaluated acc. To IEC 60085	Ref. Annex C
Transformer (T2) ***3)*** (Alternate) -Triple Insul. wires	SPI/FSP Great Leoflon	8TA00327 TRW(B)	Class B ***4)*** 130°C	IEC 60950-1 and evaluated acc. To IEC 60085 IEC 60950-1 annex U	Ref. Annex C VDE, UL
Thermistor (RT90) ***5)***	Various	Various	10K ohm at 25°C	UL 1434	UL
DC Fan (12cm)	Protechnic Protechnic Protechnic Protechnic Protechnic Protechnic Protechnic Protechnic	MGA12012HB-O25 MGA12012HF-O25 MGA12012HR-O25 MGA12012XB-O25 MGA12012XF-O25 MGA12012XR-O25 MGA12012YB-O25 MGA12012ZB-O25	12Vdc, 0.45A, 73CFM 12Vdc, 0.45A, 76.98CFM 12Vdc, 0.45A, 77CFM 12Vdc, 0.52A, 84.51CFM 12Vdc, 0.52A, 84.51CFM 12Vdc, 0.52A, 83CFM 12Vdc, 0.682A, 90.23CFM 12Vdc, 0.9A, 101.03CFM	IEC/EN 60950-1	TUV/PS TUV/PS TUV/PS TUV/PS TUV/PS TUV/PS TUV/PS TUV/PS

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Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
DC Fan (12cm) (Alternate)	Adda	AD1212LB-A71GL	12Vdc, 0.24A, 72CFM	IEC/EN 60950-1	TUV/Rh (Koln)
	Adda	AD1212LB-A70GL	12Vdc, 0.24A, 72CFM		TUV/Rh (Koln)
	Adda	AD1212LS-A70GL	12Vdc, 0.24A, 72CFM		TUV/Rh (Koln)
	Adda	AD1212MB-A71GL	12Vdc, 0.33A, 80.5CFM		TUV/Rh (Koln)
	Adda	AD1212MS-A71GL	12Vdc, 0.34A, 80.5CFM		TUV/Rh (Koln)
	Adda	AD1212HB-A71GL	12Vdc, 0.37A, 85.2CFM		TUV/Rh (Koln)
	Adda	AD1212HS-A71GL	12Vdc, 0.44A, 85.2CFM		TUV/Rh (Koln)
	Adda	AD1212UB-A71GL	12Vdc, 0.5A, 98.6CFM		TUV/Rh (Koln)
	Adda	AD1212US-A71GL	12Vdc, 0.5A, 98.6CFM		TUV/Rh (Koln)
	Adda	AD1212UB-A70GL	12Vdc, 0.5A, 98CFM		TUV/Rh (Koln)
	Adda	AD1212XB-A71GL	12Vdc, 0.65A, 110CFM		TUV/Rh (Koln)
	Powerlogic	PLA12025B12M-2	12Vdc, 0.2A, 66.127CFM		TUV/PS
	Powerlogic	PLA12025S12HH-2	12Vdc, 0.37A, 66.127CFM		TUV/PS
	Powerlogic	PLA12025S12M-2	12Vdc, 0.2A, 66.127CFM		TUV/PS
	Powerlogic	PLA12025B12H-4	12Vdc, 0.36A, 82.60CFM		TUV/PS
	Powerlogic	PLA12025S12HH-4	12Vdc, 0.42A, 82.60CFM		TUV/PS
	Powerlogic	PLA12025S12H-4	12Vdc, 0.36A, 82.60CFM		TUV/PS
	Powerlogic	PLA12025B12M	12Vdc, 0.2A, 80.507CFM		TUV/PS
	Powerlogic	PLA12025S12H	12Vdc, 0.28A, 80.507CFM		TUV/PS
	Powerlogic	PLA12025S12M	12Vdc, 0.28A, 80.507CFM		TUV/PS
	Powerlogic	PLA12025S12HH-LV	12Vdc, 0.3A, 93.098CFM		TUV/PS
	Powerlogic	PLA12025S12H-2	12Vdc, 0.3A, 93.098CFM		TUV/PS
	Powerlogic	PLA12025B12H	12Vdc, 0.28A, 96.822CFM		TUV/PS
	Powerlogic	PLA12025B12HH-4	12Vdc, 0.42A, 115.44CFM		TUV/PS

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Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
DC Fan (12cm) (Alternate)	Yate Loon Yate Loon	D12BH-12 D12SH-12	12Vdc, 0.30A, 73CFM 12Vdc, 0.30A, 73CFM	IEC/EN 60950-1	TUV/Rh (Koln) TUV/Rh (Koln)
Insulation sheet ***6)***	Various	Various	Min. V-2, min. 0.25mm thick.	UL 94	UL
Internal Wiring (Primary)	Various	Various	Rated minimum 80°C, minimum 300V, minimum No. 20 AWG. PVC, TFE, PTFE, FEP or neoprene or surface marked VW-1.	UL 758	UL
Insulating Tubing/Sleeving	Various	Various	FEP, PTFE, PVC, TFE, neoprene, or marked VW-1; minimum 105°C, minimum 300 V.	UL 224	UL

[1]) An asterisk indicates a mark which assures the agreed level of surveillance

Supplementary information:

*) an asterisk indicates a mark which assures the agreed level of surveillance.
1) CX4, CY5 and CY6 are secured on Appliance inlet. RX4 is secured on CX4.
2) When CX4=0.22μF than RX4=3.3MΩ; when CX4=0.33μF than RX4=2.2MΩ
3) For the bobbin and other material, refer to attached transformer specification for detail.
4) Complies with UL class B insulation system.
5) This component is used in the fan speed control circuit.
6) Located between HK board and L4/CX1/L1.
****)*** Varistor complies with UL 1449 3rd. which cover the required 15 combination pulses 6kV (1.2/50μs)/ 3kA (8/20μs) test this is more strict than table I group 1 of IEC 61051-2.

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1.5.1	TABLE: Opto Electronic Devices	P

Manufacturer ..... :	Sharp / Lite-On / Everlight / Bright Led / Bright Led / Bright Led
Type..... :	PC123 / LTV-817 / EL817. / BPC-817 / BPC-817S / BPC-817M
Separately tested ..... :	Tested by FIMKO and Semko
Bridging insulation ..... :	Reinforced insulation
External creepage distance..... :	8 / 7.8 / 7.7 / >7 / >7 / >7 mm
Internal creepage distance..... :	>5 / 5.2 / 6 / -*) / -*) / -*) mm
Distance through insulation..... :	0.7 / 0.8 / 0.5 / >0.4 / >0.4 / >0.4 mm
Tested under the following conditions..... :	R, S, B
Input..... :	
Output..... :	

Supplementary information:

- ***)** There is not any internal creepage distance. Test according to IEC60950-1:2001, cl. 2.10.8 (same as requirement in IEC60950-1:2005, cl. 2.10.9) has been carried out ten times for the components at 100°C/25°C/0°C/25°C. Humidity treatment of 48 h as well as electric strength tests at 3000 V/1 minute and 5000 V/1 minute were carried out to the component after thermal cycling test.

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1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
For model FSP550-80GHN(85) with T2 type 8TC00207						
90, 50Hz	8.08		724	F1	8.08	Normal load, condition A
100, 50Hz	7.15	9	712	F1	7.15	Normal load, condition A
240, 50Hz	2.88	4	679	F1	2.88	Normal load, condition A
254, 50Hz	2.72		678	F1	2.72	Normal load, condition A
264, 50Hz	2.62		678	F1	2.62	Normal load, condition A
90, 60Hz	8.08		724	F1	8.08	Normal load, condition A
100, 60Hz	7.15	9	711	F1	7.15	Normal load, condition A
240, 60Hz	2.88	4	679	F1	2.88	Normal load, condition A
254, 60Hz	2.72		679	F1	2.72	Normal load, condition A
264, 60Hz	2.62		678	F1	2.62	Normal load, condition A
90, 50Hz	8.03		720	F1	8.03	Normal load, condition B
100, 50Hz	7.11	9	709	F1	7.11	Normal load, condition B
240, 50Hz	2.86	4	675	F1	2.86	Normal load, condition B
254, 50Hz	2.70		674	F1	2.70	Normal load, condition B
264, 50Hz	2.60		673	F1	2.60	Normal load, condition B
90, 60Hz	8.03		721	F1	8.03	Normal load, condition B
100, 60Hz	7.11	9	710	F1	7.11	Normal load, condition B
240, 60Hz	2.86	4	676	F1	2.86	Normal load, condition B
254, 60Hz	2.70		674	F1	2.70	Normal load, condition B
264, 60Hz	2.60		673	F1	2.60	Normal load, condition B
90, 50Hz	7.76		687	F1	7.76	Normal load, condition C
100, 50Hz	6.83	9	680	F1	6.83	Normal load, condition C
240, 50Hz	2.75	4	647	F1	2.75	Normal load, condition C
254, 50Hz	2.59		646	F1	2.59	Normal load, condition C
264, 50Hz	2.50		646	F1	2.50	Normal load, condition C
90, 60Hz	7.76		688	F1	7.76	Normal load, condition C
100, 60Hz	6.83	9	680	F1	6.83	Normal load, condition C
240, 60Hz	2.75	4	648	F1	2.75	Normal load, condition C
254, 60Hz	2.59		647	F1	2.59	Normal load, condition C
264, 60Hz	2.50		646	F1	2.50	Normal load, condition C

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U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
For model FSP550-80GHN(85) with T2 type 8TA00327						
90, 50Hz	8.08		724	F1	8.08	Normal load, condition A
100, 50Hz	7.15	9	712	F1	7.15	Normal load, condition A
240, 50Hz	2.88	4	679	F1	2.88	Normal load, condition A
254, 50Hz	2.72		678	F1	2.72	Normal load, condition A
264, 50Hz	2.62		678	F1	2.62	Normal load, condition A
90, 60Hz	8.06		722	F1	8.06	Normal load, condition A
100, 60Hz	7.15	9	711	F1	7.15	Normal load, condition A
240, 60Hz	2.88	4	679	F1	2.88	Normal load, condition A
254, 60Hz	2.72		679	F1	2.72	Normal load, condition A
264, 60Hz	2.62		678	F1	2.62	Normal load, condition A
90, 50Hz	8.03		720	F1	8.03	Normal load, condition B
100, 50Hz	7.11	9	709	F1	7.11	Normal load, condition B
240, 50Hz	2.86	4	675	F1	2.86	Normal load, condition B
254, 50Hz	2.70		674	F1	2.70	Normal load, condition B
264, 50Hz	2.60		673	F1	2.60	Normal load, condition B
90, 60Hz	8.03		721	F1	8.03	Normal load, condition B
100, 60Hz	7.11	9	710	F1	7.11	Normal load, condition B
240, 60Hz	2.86	4	676	F1	2.86	Normal load, condition B
254, 60Hz	2.70		674	F1	2.70	Normal load, condition B
264, 60Hz	2.60		673	F1	2.60	Normal load, condition B
90, 50Hz	7.76		687	F1	7.76	Normal load, condition C
100, 50Hz	6.83	9	680	F1	6.83	Normal load, condition C
240, 50Hz	2.75	4	647	F1	2.75	Normal load, condition C
254, 50Hz	2.59		646	F1	2.59	Normal load, condition C
264, 50Hz	2.50		646	F1	2.50	Normal load, condition C
90, 60Hz	7.67		688	F1	7.67	Normal load, condition C
100, 60Hz	6.83	9	680	F1	6.83	Normal load, condition C
240, 60Hz	2.75	4	648	F1	2.75	Normal load, condition C
254, 60Hz	2.59		647	F1	2.59	Normal load, condition C
264, 60Hz	2.50		646	F1	2.50	Normal load, condition C

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U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
For model FSP500-80GHN(85) with T2 type 8TC00207						
90, 50Hz	7.31		655	F1	7.31	Normal load, condition A
100, 50Hz	6.48	8	645	F1	6.48	Normal load, condition A
240, 50Hz	2.63	4	618	F1	2.63	Normal load, condition A
254, 50Hz	2.49		618	F1	2.49	Normal load, condition A
264, 50Hz	2.40		617	F1	2.40	Normal load, condition A
90, 60Hz	7.31		655	F1	7.31	Normal load, condition A
100, 60Hz	6.48	8	646	F1	6.48	Normal load, condition A
240, 60Hz	2.62	4	618	F1	2.62	Normal load, condition A
254, 60Hz	2.48		617	F1	2.48	Normal load, condition A
264, 60Hz	2.40		617	F1	2.40	Normal load, condition A
90, 50Hz	7.22		647	F1	7.22	Normal load, condition B
100, 50Hz	6.42	8	639	F1	6.42	Normal load, condition B
240, 50Hz	2.60	4	610	F1	2.60	Normal load, condition B
254, 50Hz	2.46		610	F1	2.46	Normal load, condition B
264, 50Hz	2.37		609	F1	2.37	Normal load, condition B
90, 60Hz	7.22		648	F1	7.22	Normal load, condition B
100, 60Hz	6.42	8	638	F1	6.42	Normal load, condition B
240, 60Hz	2.59	4	610	F1	2.59	Normal load, condition B
254, 60Hz	2.45		610	F1	2.45	Normal load, condition B
264, 60Hz	2.37		609	F1	2.37	Normal load, condition B
90, 50Hz	6.90		618	F1	6.90	Normal load, condition C
100, 50Hz	6.13	8	611	F1	6.13	Normal load, condition C
240, 50Hz	2.49	4	585	F1	2.49	Normal load, condition C
254, 50Hz	2.36		585	F1	2.36	Normal load, condition C
264, 50Hz	2.26		585	F1	2.26	Normal load, condition C
90, 60Hz	6.92		620	F1	6.92	Normal load, condition C
100, 60Hz	6.13	8	611	F1	6.13	Normal load, condition C
240, 60Hz	2.49	4	585	F1	2.49	Normal load, condition C
254, 60Hz	2.35		584	F1	2.35	Normal load, condition C
264, 60Hz	2.26		584	F1	2.26	Normal load, condition C

U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
For model FSP460-80GHN(85) with T2 type 8TC00207						
90, 50Hz	6.71		601	F1	6.71	Normal load, condition A
100, 50Hz	5.97	7.5	595	F1	5.97	Normal load, condition A
240, 50Hz	2.43	3.5	570	F1	2.43	Normal load, condition A
254, 50Hz	2.30		569	F1	2.30	Normal load, condition A
264, 50Hz	2.21		569	F1	2.21	Normal load, condition A
90, 60Hz	6.71		602	F1	6.71	Normal load, condition A
100, 60Hz	5.97	7.5	595	F1	5.97	Normal load, condition A
240, 60Hz	2.42	3.5	570	F1	2.42	Normal load, condition A
254, 60Hz	2.29		569	F1	2.29	Normal load, condition A
264, 60Hz	2.21		569	F1	2.21	Normal load, condition A
90, 50Hz	6.60		590	F1	6.60	Normal load, condition B
100, 50Hz	5.87	7.5	586	F1	5.87	Normal load, condition B
240, 50Hz	2.39	3.5	561	F1	2.39	Normal load, condition B
254, 50Hz	2.27		561	F1	2.27	Normal load, condition B
264, 50Hz	2.19		561	F1	2.19	Normal load, condition B
90, 60Hz	6.60		591	F1	6.60	Normal load, condition B
100, 60Hz	5.87	7.5	584	F1	5.87	Normal load, condition B
240, 60Hz	2.39	3.5	561	F1	2.39	Normal load, condition B
254, 60Hz	2.26		561	F1	2.26	Normal load, condition B
264, 60Hz	2.19		561	F1	2.19	Normal load, condition B
90, 50Hz	6.31		566	F1	6.31	Normal load, condition C
100, 50Hz	5.62	7.5	560	F1	5.62	Normal load, condition C
240, 50Hz	2.29	3.5	537	F1	2.29	Normal load, condition C
254, 50Hz	2.17		537	F1	2.17	Normal load, condition C
264, 50Hz	2.10		536	F1	2.10	Normal load, condition C
90, 60Hz	6.31		566	F1	6.31	Normal load, condition C
100, 60Hz	5.61	7.5	559	F1	5.61	Normal load, condition C
240, 60Hz	2.28	3.5	536	F1	2.28	Normal load, condition C
254, 60Hz	2.16		536	F1	2.16	Normal load, condition C
264, 60Hz	2.10		536	F1	2.10	Normal load, condition C
Supplementary information:						

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2.1.1.5 c1)	TABLE: max. V, A, VA test	—

Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA) *)
For model FSP550-80GHN(85) with T2 type 8TC00207				
+3.3V	25	3.6	50.3	113.0
+5V	25	5.24	46.2	168.0
+12V1 *1)*	18	13.6	26.8	326.0
+12V2 *1)*	18	13.5	26.8	311.0
+12V3 *1)*	18	13.4	28.4	331.0
+12V4 *1)*	18	13.5	29.3	341.0
-12V	0.8	13.2	9.0	56.0
+5Vsb	3	5.16	11.2	28.0
For model FSP550-80GHN(85) with T2 type 8TC00327				
+5Vsb	3	5.16	10.5	26.6
Supplementary information:				
) The above measurements are the maximum values (max. V and max. A not obtained at the same time) *1)* Must be checked in the end product				

2.1.1.5 c2)	TABLE: stored energy	N

Capacitance C (µF)	Voltage U (V)	Energy E (J)
Supplementary information:		
$E=0,5\ CU^2 \times 10^{-6}$		

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2.2	TABLE: evaluation of voltage limiting components in SELV circuits	P

Component (measured between)	max. voltage (V) (normal operation)		Voltage Limiting Components
	V peak	V d.c.	
For model FSP550-80GHN(85)			
Transformer T1, pin 8, 9 – pin FLY	10.6		
Transformer T1, pin 11, 12, 13, 14 – pin FLY	20.1		
Transformer T2 (Type 8TC00207), pin 9, 10 – pin 6, 7	23.2		
Transformer T2 (Type 8TA00327), pin 5 – pin 2	22.0		

Fault test performed on voltage limiting components	Voltage measured (V) in SELV circuits (V peak or V d.c.)

Supplementary information:

S-c=Short circuit
T1 pin FLY, T2 (Type 8TC00207) pin 6, 7 and T2 (Type 8TA00327) pin 2 are RTN

2.5	TABLE: limited power sources	N

Circuit output tested: …….

Measured Uoc (V) with all load circuits disconnected:

	I_{sc} (A)		VA	
	Meas.	Limit	Meas.	Limit
Normal condition				
Single fault:				

Supplementary information:

S-c=Short circuit, O-c=Open circuit

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2.10.2	Table: working voltage measurement	P

Location	RMS voltage (V)	Peak voltage (V)	Comments
For model FSP550-80GHN(85)			
T1 pin 4 – 8, 9	192	352	
T1 pin 4 – FLY	205	384	
T1 pin 4 – 11, 12, 13, 14	199	368	
T1 pin 7 – 8, 9	**227**	**400**	
T1 pin 7 – FLY	214	368	
T1 pin 7 – 11, 12, 13, 14	215	384	
T2 pin 1 – 6, 7	345	520	T2, type 8TC00207
T2 pin 1 – 9, 10	**345**	**528**	T2, type 8TC00207
T2 pin 2 – 6, 7	310	432	T2, type 8TC00207
T2 pin 2 – 9, 10	310	424	T2, type 8TC00207
T2 pin 3 – 6, 7	172	400	T2, type 8TC00207
T2 pin 3 – 9, 10	173	400	T2, type 8TC00207
T2 pin 4 – 6, 7	172	352	T2, type 8TC00207
T2 pin 4 – 9, 10	171	352	T2, type 8TC00207
T2 pin 7 – 2	**347**	**520**	T2, type 8TA00327
T2 pin 7 – 5	341	504	T2, type 8TA00327
T2 pin 8 – 2	310	416	T2, type 8TA00327
T2 pin 8 – 5	310	472	T2, type 8TA00327
T2 pin 9 – 2	172	408	T2, type 8TA00327
T2 pin 9 – 5	171	384	T2, type 8TA00327
T2 pin 10 – 2	171	352	T2, type 8TA00327
T2 pin 10 – 5	170	352	T2, type 8TA00327
M2 pin 1 – 3	**178**	**360**	
M2 pin 2 – 3	178	352	
M2 pin 1 – 4	175	360	
M2 pin 2 – 4	168	352	
M3 pin 1 – 3	173	**360**	
M3 pin 2 – 3	**174**	352	
M3 pin 1 – 4	173	352	
M3 pin 2 – 4	173	352	
M5 pin 1 – 3	**161**	**336**	
M5 pin 2 – 3	161	336	
M5 pin 1 – 4	161	328	
M5 pin 2 – 4	161	328	
CY8 pri. trace – CY8 sec. trace	171	352	
Supplementary information:			
Supply voltage: 240Vac T1 pin FLY, T2 (Type 8TC00207) pin 6, 7 and T2 (Type 8TA00327) pin 2 are RTN			

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2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements					P
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Functional: Line – Neutral before fuse	339	240	1.5	2.6	2.5	2.6
Functional: Fuse pad 1 – pad 2 before fuse	339	240	1.5	2.6	2.5	2.6
Basic: CY1 trace (prim.) – earthed screw trace (GND)	339	240	2.0	2.1	2.5	2.6
Basic: CY1 body (prim.) – earthed screw (GND)	339	240	2.0	3.0	2.5	>3.0 ***2)***
Basic: CY2 trace (prim.) – earthed screw trace (GND)	339	240	2.0	2.1	2.5	2.6
Basic: CY2 body (prim.) – earthed screw (GND)	339	240	2.0	4.2	2.5	>4.2 ***2)***
Basic: HS2 (prim.) – earthed screw (GND)	339	240	2.0	4.8	2.5	4.8
Reinforced: Under T2 trace (prim.) – trace (sec.)	528 ***3)***	347 ***3)***	4.4	7.7	7.2 ***1)***	7.7
Reinforced: M3 pin 3, 4 (prim.) – M3 pin 1, 2 (sec.)	360	174	4.0	7.0	5.0	7.0
Reinforced: Under T1 trace (prim.) – trace (sec.)	400	227	4.0	7.1	5.0	7.1
Reinforced: Under CY8 trace (prim.) – trace (GND)	352	171	4.0	4.8	5.0	7.1 ***2)***
Reinforced: M2 pin 3, 4 (prim.) – M2 pin 1, 2 (sec.)	360	178	4.0	6.3	5.0	>6.3 ***2)***
Reinforced: M5 pin 3, 4 (prim.) – M5 pin 1, 2 (sec.)	336	161	4.0	6.3	5.0	6.6 ***2)***
Reinforced: CY2 trace (prim.) – M5 trace (sec.)	339	240	4.0	5.2	5.0	5.2

Supplementary information:

****)*** Distance required acc. to IEC 60950-1 first edition for worst case.
1) Linear interpolation used. ***2)*** There is a gap >1 mm under component. ***3)*** Worst case considered.
- No components reduced the distance after a force of 10N is applied.
- The following components are glue in place: CX4/Inlet, F1/L/PCB, L4/L5, L1/mylar sheet/PCB, CY2/CX3, L3/PCB, L3/C11/L10 and CY8/T1 core.
- The following components are covered by tubing: EMI core around on L/N wire, F1, lead of F1, lead of CX4, primary wire use on Power switch, L4, L5, RT11 and DC Fan wire.
- Two layers insulation tape stick on top metal enclosure and between top metal enclosure and HS2.
- Transformer T2 body bottom outside surrounded by two layer of insulation tape.
- A piece of mylar sheet located between HK board and L4/CX1/L1

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2.10.5	TABLE: Distance through insulation measurements				P
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
Basic: Insulation sheet between HK board and L4/CX1/L1.	339	240	1500V ac	--	1 layer
Basic: Two layers insulation tape stick on top metal enclosure and between top metal enclosure and HS2.	339	240	1500V ac	--	1 layer
Basic: tube on core EMI core around on L/N wire, F1, lead of F1, lead of CX4, primary wire use on Power switch, L4, L5 and DC Fan wire.	528	347	1803V ac	--	1 layer
Insulation tape in transformer (T1) Reinforced- 3 layers (Tested 2 layers) Basic: 1 layer	400	227	3000V ac 1500V ac	3 layers --	3 layers 1 layer
Insulation tape in transformer (T2, type 8TC00207) Reinforced- 3 layers (Tested 2 layers) Basic: 1 layer	528	345	3000V ac 1803V ac	3 layers --	3 layers 1 layer
Reinforced: two layers insulation tape attached on the transformer T2 (type 8TA00327) body bottom outside. (Tested 1 layer)	520	347	3000V ac	2 layers	2 layers
Supplementary information:					

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4.3.8	TABLE: Batteries	N

Battery category ..... :
Manufacturer ..... :
Type / model..... :
Voltage ..... : V
Capacity ..... : mAh
Tested and Certified by (incl. Ref. No.)..... :

Circuit protection diagram:

MARKINGS AND INSTRUCTIONS (1.7.12, 1.7.15)	
Location of replaceable battery	
	Language(s):
Close to the battery	
In the servicing instructions	
In the operating instructions	

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4.3.8	TABLE: Batteries									N
The tests of 4.3.8 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. current during normal condition										
Max. current during fault 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:										

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4.5	TABLE: Thermal requirements							P
	Supply voltage (V):	90V ***1)***	90V ***2)***	90V ***3)***	264V ***1)***	90V ***1)***	90V ***1)***	
Maximum measured temperature T of part/at:		T (°C)						Allowed T_{max} (°C)
For model FSP550-80GHN(85) (with T2 type 8TC00207)								
Inlet pin		54.9	54.5	54.3	53.1	40.2	28.2	65
CY5 body		52.6	52.2	52.2	51.8	38.7	27.0	85
CX4 body		55.7	55.2	55.0	54.9	41.2	29.6	85
Input wire		56.9	56.5	56.2	53.3	39.5	27.9	80
L4 coil		63.1	62.5	61.6	53.5	45.7	33.6	95
L5 coil		72.8	72.1	70.6	56.0	55.2	42.2	95
CX1 body		55.0	54.6	54.3	53.3	40.4	28.3	85
L1 coil		69.8	69.2	67.9	55.8	54.6	41.9	110
CY1 body		69.6	68.8	67.8	64.4	54.2	42.3	85
CY8 body		90.9	89.7	87.8	90.9	74.3	63.2	85
CX3 body		69.4	68.8	67.7	67.2	58.5	47.1	85
PCB under BD1		89.7	88.1	86.5	82.4	65.8	54.6	130
L3 coil		95.2	93.1	90.0	60.5	86.2	71.3	110
HS2 near Q10		66.9	65.8	64.8	55.9	54.7	41.1	--
C10 body		61.4	60.6	59.9	58.2	53.2	40.9	85
T3 coil		66.4	65.2	64.6	61.3	62.0	49.1	95
L10 coil		82.5	81.1	79.4	59.5	79.5	65.0	95
HS3 near Q61		87.5	85.4	84.2	75.6	78.6	65.9	--
T2 primary coil		69.9	68.5	67.5	69.0	67.5	55.5	110
T2 secondary coil		68.5	66.8	65.5	68.4	76.0	64.6	110
T2 core		65.3	63.4	62.8	65.1	58.7	47.1	110
M3 body		73.1	70.8	69.8	73.1	85.3	73.0	100
T1 primary coil		78.2	76.2	73.9	72.2	90.5	74.4	110
T1 secondary coil		106.3	104.1	101.2	104.1	94.6	81.4	110
T1 core		72.5	71.2	70.1	72.0	60.9	48.9	110
M5 body		91.1	89.9	87.9	88.5	63.9	52.6	100
L30 coil		87.5	79.9	80.0	87.8	92.2	80.6	--
HS4 near D50		61.3	60.5	58.9	61.4	57.2	45.0	--
L31 coil		65.8	58.5	56.5	65.8	54.1	42.1	--
L20 coil		63.3	65.0	64.9	63.4	53.7	40.8	--
Outside enclosure		53.4	53.1	52.9	53.2	42.7	30.9	70
Ambient		50.5	50.2	50.0	50.6	37.5	26.0	--
Supplementary information:								
Having a specified maximum ambient temperature of 50°C. Air flow of fan is 66.127CFM. Temperature limits include less 10K for thermocouple measurement method. Tested according to cl. 1.4.12. If no limit is stated, temperature is for reference only. ***1)*** Tested on condition A; ***2)*** Tested on condition B; ***3)*** Tested on condition C L1, L3 type 8LM01414 and L10 type 8LA00184 are represent worst condition.								

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4.5	TABLE: Thermal requirements ***(Continued)***							**P**
	Supply voltage (V):	90V ***1)***	90V ***2)***	90V ***3)***	264V ***1)***	90V ***1)***	90V ***1)***	
Maximum measured temperature T of part/at:		T (°C)						Allowed T_{max} (°C)
For model FSP550-80GCM(85) (with T2 type 8TC00207)								
Inlet pin		54.0	53.4	53.3	51.9	40.6	29.2	65
CY5 body		54.4	53.9	53.9	52.6	40.8	28.9	85
CX4 body		54.2	54.4	54.2	53.4	41.0	29.4	85
Input wire		58.3	56.7	56.5	53.6	43.3	31.3	80
L4 coil		76.9	74.2	72.9	55.4	59.9	46.7	95
L5 coil		66.3	65.5	64.6	54.2	51.4	39.1	95
CX1 body		55.0	54.7	54.7	53.0	41.5	29.7	85
L1 coil		65.2	66.3	65.4	56.5	52.6	40.4	110
CY1 body		68.6	69.3	68.6	62.9	55.8	43.9	85
CY8 body		94.9	93.9	91.9	94.2	80.5	67.1	85
CX3 body		70.7	71.0	70.5	69.7	58.2	46.3	85
PCB under BD1		80.1	80.5	80.0	74.6	68.0	56.3	130
L3 coil		93.0	93.6	91.2	59.3	78.3	64.0	110
HS2 near Q10		64.9	64.4	63.9	55.2	49.7	36.6	--
C10 body		61.2	60.7	60.4	57.4	47.8	35.8	85
T3 coil		69.5	68.8	68.3	64.5	54.9	42.1	95
L10 coil		87.3	87.5	85.8	60.4	72.8	59.3	95
HS3 near Q61		81.6	80.7	79.9	71.5	66.7	53.6	--
T2 primary coil		65.5	65.9	65.6	65.9	52.9	40.8	110
T2 secondary coil		66.8	66.2	65.6	66.7	53.8	41.7	110
T2 core		61.8	61.3	60.7	62.1	49.3	37.4	110
M3 body		63.0	61.6	60.9	62.7	49.2	37.0	100
T1 primary coil		83.1	81.3	79.8	81.8	67.6	54.7	110
T1 secondary coil		79.4	67.2	66.6	67.4	55.6	42.8	110
T1 core		75.5	65.8	64.7	65.2	52.6	39.9	110
M5 body		83.1	82.9	82.2	82.0	70.8	59.4	100
L30 coil		75.3	73.6	73.6	79.7	65.8	53.3	--
HS4 near D50		69.8	68.6	65.7	71.0	57.2	44.9	--
L31 coil		64.3	63.9	63.6	70.8	56.6	44.1	--
L20 coil		63.2	62.5	64.4	61.1	47.4	35.4	--
Outside enclosure		55.1	54.6	53.8	54.8	41.8	30.0	70
Ambient		50.0	50.2	50.3	50.4	37.6	26.5	--
Supplementary information:								
Having a specified maximum ambient temperature of 50°C. Air flow of fan is 66.127CFM. Temperature limits include less 10K for thermocouple measurement method. Tested according to cl. 1.4.12. If no limit is stated, temperature is for reference only. ***1)*** Tested on condition A; ***2)*** Tested on condition B; ***3)*** Tested on condition C L1, L3 type 8LM01414 and L10 type 8LA00184 are represent worst condition.								

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4.5	TABLE: Thermal requirements ***(Continued)***							P
	Supply voltage (V):	90V ***1)***	264V ***1)***	90V ***1)***	264V ***1)***			
Maximum measured temperature T of part/at:		T (°C)						Allowed T_{max} (°C)
For model FSP550-80GHN(85) (with T2 type 8TA00327)								
Inlet pin		56.7	53.3	--	--			65
CY5 body		54.0	52.1	--	--			85
CX4 body		58.5	56.1	--	--			85
Input wire		58.5	54.0	--	--			80
L4 coil		62.9	53.3	--	--			95
L5 coil		72.9	56.7	--	--			95
CX1 body		55.6	53.2	--	--			85
L1 coil		69.8	55.3	--	--			110
CY1 body		70.7	63.5	--	--			85
CY8 body		90.4	87.3	--	--			85
CX3 body		69.2	65.5	--	--			85
PCB under BD1		89.4	80.7	--	--			130
L3 coil		87.6	58.1	--	--			110
HS2 near Q10		67.0	55.5	--	--			--
C10 body		61.7	57.8	--	--			85
T3 coil		67.3	61.0	--	--			95
L10 coil		79.3	58.4	--	--			95
HS3 near Q61		89.5	76.0	--	--			--
T2 primary coil		71.1	69.4	--	--			110
T2 secondary coil		69.1	67.9	--	--			110
T2 core		68.8	67.5	--	--			110
M3 body		80.2	79.0	--	--			100
T1 primary coil		--	--	104.9	102.9			110
T1 secondary coil		--	--	97.2	95.1			110
T1 core		--	--	66.2	64.8			110
M5 body		86.3	83.6	--	--			100
L30 coil		96.5	95.4	--	--			--
HS4 near D50		63.0	62.1	--	--			--
L31 coil		67.3	66.5	--	--			--
L20 coil		71.9	70.5	--	--			--
Outside enclosure		54.9	53.9	--	--			70
Ambient		50.3	51.6	50.4	50.1			--
Supplementary information:								
Having a specified maximum ambient temperature of 50°C. Air flow of fan is 66.127CFM. Temperature limits include less 10K for thermocouple measurement method. Tested according to cl. 1.4.12. If no limit is stated, temperature is for reference only. ***1)*** Tested on condition A. L1, L3 type 8LM01414 and L10 type 8LA00184 are represent worst condition.								

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4.5	TABLE: Thermal requirements ***(Continued)***					P
	Supply voltage (V):	90V ***1)***	90V ***1)***	90V ***4)***	90V ***4)***	
Maximum measured temperature T of part/at:		T (°C)				Allowed T_{max} (°C)
For model FSP550-80GHN(85)		With T2 type 8TC00207			With T2 type 8TA00327	
PCB under RT11		74.5	63.7	--	--	130
RV1 body		82.4	65.2	--	--	--
T1 coil		--	--	53.7	55.0	110
T2 coil		--	--	102.3	97.9	110
Ambient		50.9	50.4	50.2	50.6	--
Supplementary information:						
Having a specified maximum ambient temperature of 50°C. Air flow of fan is 66.127CFM. Temperature limits include less 10K for thermocouple measurement method. Tested according to cl. 1.4.12. If no limit is stated, temperature is for reference only. ***1)*** Tested on condition A; ***4)*** Tested on condition D						

4.5.5	TABLE: Ball pressure test of thermoplastic parts		N
	Allowed impression diameter (mm) .....:	≤ 2 mm	—
Part		Test temperature (°C)	Impression diameter (mm)
Supplementary information:			
Materials in T1, T2 and T3 bobbin are Phenolic.			

4.7	TABLE: Resistance to fire				P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
Chassis		metal	0.8mm		
Supplementary information:					

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5.1	TABLE: touch current measurement	P

Measured between:	Measured (mA)	Limit (mA)	Comments/conditions
Line – protective earthing	0.64	3.5	Fuse in, switch on.
Neutral – protective earthing	0.64	3.5	Fuse in, switch on.
Line – each output connector +	0.24	0.25	Fuse in, switch on.
Neutral – each output connector +	0.24	0.25	Fuse in, switch on.
Supplementary information:			
All Y-caps. are max. value in according to appended table 1.5.1.			

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests	P

Test voltage applied between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Reinforced: Primary – Secondary	DC	4242	No
Basic: Primary – Protective Earth	DC	2550	No
T1 Primary – Secondary	AC	3000	No
T1 Primary – Core	AC	1569	No
T1 Secondary – Core	AC	1569	No
T2 (type 8TC00207) Primary – Secondary	AC	3000	No
T2 (type 8TC00207) Primary – Core	AC	1803	No
T2 (type 8TC00207) Secondary – Core	AC	1803	No
T2 (type 8TA00327) Primary – Secondary	AC	3000	No
T2 (type 8TA00327) Secondary – Core	AC	3000	No
Supplementary information:			

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5.3	TABLE: Fault condition tests		P
	Ambient temperature (°C) .....:	25°C if not state.	—
	Power source for EUT: Manufacturer, model/type, output rating .....:		—

Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
For model FSP550-50GHN(85) (with T2 type 8TC00207)						
Fan	Locked	240	2 hrs 58 min	F1	2.88	Unit normal operation, temperature was stable, Max. temp. of T1 coil= 113.9°C, T2 coil=120.2°C, ambient= 26.2°C, no damage, no hazard.
Ventilation openings	Blocked	240	4 hrs 7 min	F1	2.88	Unit normal operation, temperature was stable, Max. temp. of T1 coil= 118.8°C, T2 coil=114.3°C, ambient= 24.4°C, no damage, no hazard.
BD1 ~ to +	s-c	240	1 sec	F1	***1)***	Fuse (F1) open instantly, no hazard.
C10	s-c	240	1 sec	F1	***1)***	Fuse (F1) open instantly, no hazard.
Q10 (G to S)	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
Q10 (G to D)	s-c	240	1 sec	F1	***1)***	Fuse (F1) open instantly, Q10 damage, no hazard.
Q10 (D to S)	s-c	240	1 sec	F1	***1)***	Fuse (F1) open instantly, Q10 damage, no hazard.
Q61 (G to S)	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
Q61 (G to D)	s-c	240	1 sec	F1	***1)***	Fuse (F1) open instantly, Q10 damage, no hazard.
Q61 (D to S)	s-c	240	1 sec	F1	***1)***	Fuse (F1) open instantly, Q10 damage, no hazard.
M4 (pin 3 to 6, 7, 8)	s-c	240	1 sec	F1	0.02	All outputs shutdown, M4, Z42 damage, no hazard. ***2)***

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
M2 (pin 1 to 2)	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
M2 (pin 3 to 4)	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
M2 (pin 1)	o-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
M3 (pin 1 to 2)	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
M3 (pin 3 to 4)	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
M3 (pin 1)	o-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
M5 (pin 1 to 2)	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
M5 (pin 3 to 4)	s-c	240	1 hrs 2 min	F1	2.80	Unit normal operation, temperature was stable, Max. temp. of T1 coil= 66.0°C, T2 coil=43.0°C, ambient= 26.9°C, no damage, no hazard.
M5 (pin 1)	o-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
D20	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
D50	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
D30	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
D43	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
T1, (pin 8, 9 to FLY)	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
T1, (pin 11, 12, 13, 14 to FLY)	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
T1, (pin 8, 9 to 11, 12, 13, 14)	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
T2, (pin 6, 7 to 9, 10)	s-c	240	1 sec	F1	0.12	All outputs shutdown, D43 damage, no hazard. ***2)***
T2, (pin 1 to 2)	s-c	240	30 min	F1	0.13-0.19	Unit cycle protection, no damage, no hazard.
T2, (pin 3 to 4)	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+3.3V to +5V	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+3.3V to +12V1	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+3.3V to +12V2	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+3.3V to +12V3	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+3.3V to +12V4	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+3.3V to -12V	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+3.3V to +5Vsb	s-c	240	1 hrs 15 min	F1	2.80	Unit normal operation except +5Vsb output voltage down to 3.8Vdc. Max. temp. of T1 coil= 66.8°C, T2 coil=43.8°C, ambient= 26.6°C, no damage, no hazard.
+5V to +12V1	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+5V to +12V2	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+5V to +12V3	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+5V to +12V4	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
+5V to -12V	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+5V to +5Vsb	s-c	240	2 hrs 13 min	F1	2.88	Unit normal operation. Max. temp. of T1 coil= 69.3°C, T2 coil=46.0°C, ambient= 28.5°C, no damage, no hazard.
+12V1 to +12V2	s-c	240	1 hrs 57 min	F1	2.88	Unit normal operation. Max. temp. of T1 coil= 86.1°C, T2 coil=53.3°C, ambient= 27.1°C, no damage, no hazard.
+12V1 to +12V3	s-c	240	1 hrs 26 min	F1	2.88	Unit normal operation. Max. temp. of T1 coil= 86.5°C, T2 coil=53.3°C, ambient= 27.2°C, no damage, no hazard.
+12V1 to +12V4	s-c	240	1 hrs 45 min	F1	2.88	Unit normal operation. Max. temp. of T1 coil= 87.2°C, T2 coil=53.3°C, ambient= 26.8°C, no damage, no hazard.
+12V1 to -12V	s-c	240	30 min	F1	0.31	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V1 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+12V2 to +12V3	s-c	240	1 hrs 27 min	F1	2.88	Unit normal operation. Max. temp. of T1 coil= 84.8°C, T2 coil=51.3°C, ambient= 26.1°C, no damage, no hazard.
+12V2 to +12V4	s-c	240	1 hrs 2 min	F1	2.88	Unit normal operation. Max. temp. of T1 coil= 77.3°C, T2 coil=47.3°C, ambient= 27.7°C, no damage, no hazard.

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
+12V2 to -12V	s-c	240	30 min	F1	0.31	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V2 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+12V3 to +12V4	s-c	240	1 hrs 31 min	F1	2.88	Unit normal operation. Max. temp. of T1 coil= 68.1°C, T2 coil=44.8°C, ambient= 27.5°C, no damage, no hazard.
+12V3 to -12V	s-c	240	30 min	F1	0.31	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V3 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+12V4 to -12V	s-c	240	30 min	F1	0.31	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V4 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
-12V to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+3.3V output	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+5V output	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V1 output	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V2 output	s-c	240	30 min	F1	0.25	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V3 output	s-c	240	30 min	F1	0.31	All outputs shutdown except +5Vsb, no damage, no hazard.
+12V4 output	s-c	240	30 min	F1	0.31	All outputs shutdown except +5Vsb, no damage, no hazard.
-12V output	s-c	240	30 min	F1	0.31	All outputs shutdown except +5Vsb, no damage, no hazard.
+5Vsb output	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
T1 pin 11, 12, 13, 14 (after D30 / D31) (+3.3V)	o-l	240	3 hrs 4 min	F1	3.05	+3.3V output load 25A, after transformer load CT at 11A, increase to 13A and all outputs shutdown except +5Vsb. Max. temp. measured of T1 coil=120°C, T2 coil=104°C, ambient=26.7°C, no damage, no hazard. (Output load Con. A)
T1 pin 11, 12, 13, 14 (after D50 / D51) (+5V)	o-l	240	4 hrs 51 min	F1	3.32	+5V output load 25A, after transformer load CT at 8A, increase to 10A and all outputs shutdown except +5Vsb. Max. temp. measured of T1 coil=116°C, T2 coil=92°C, ambient=25.5°C, no damage, no hazard. (Output load Con. B)
T1 pin 8, 9 (after D20 / D21) (+12V1 & +12V2 & +12V3 & +12V4)	o-l	240	6 hrs 2 min	F1	3.56	+12V1/+12V2/+12V3/+12V4 output load 0A/7.4A/18A/18A, after transformer load CT at 13A, increase to 15A and all outputs shutdown except +5Vsb. Max. temp. measured of T1 coil=136°C, T2 coil=93°C, ambient=24.9°C, no damage, no hazard. (Output load Con. C)
T2 pin 9, 10 (after D43) (+5Vsb)	o-l	240	10 hrs 45 min	F1	2.98	+5Vsb output load 3A, after transformer load CT at 3A, increase to 3.5A and unit shutdown except +5Vsb. Max. temp. measured of T1 coil=80°C, T2 coil=98°C, ambient=24.3°C, no damage, no hazard. (Output load Con. A)

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
+3.3V output	o-l	240	5 hrs 6 min	F1	3.23	CT at 39A, increase to 40A and all outputs shutdown except +5Vsb. Max. temp. of T1 coil=132°C, T2 coil=100°C, ambient=26.3°C, no damage, no hazard. (Output load Con. A)
+5V output	o-l	240	4 hrs 8 min	F1	3.28	CT at 33A, increase to 34A and all outputs shutdown except +5Vsb. Max. temp. of T1 coil=132°C, T2 coil=98°C, ambient=24.4°C, no damage, no hazard. (Output load Con. B)
+12V4 output	o-l	240	3 hrs 19 min	F1	3.08	CT at 23.5A, increase to 25A and all outputs shutdown except +5Vsb. Max. temp. of T1 coil=107°C, T2 coil=96°C, ambient=26.3°C, no damage, no hazard. (Output load Con.C)
-12V output	o-l	240	1 hrs 46 min	F1	2.93	CT at 2.5A, increase to 2.8A and all outputs shutdown except +5Vsb. Max. temp. of T1 coil=95°C, T2 coil=96°C, ambient=27.2°C, no damage, no hazard. (Output load Con. A)
+5Vsb output	o-l	240	4 hrs 7 min	F1	2.95	CT at 6A, maximum increase to 6.5A and other outputs shutdown. Max. temp. of T1 coil=72°C, T2 coil=108°C, ambient=25.9°C, no damage, no hazard. (Output load Con. A)
For model FSP550-50GHN(85) (with T2 type 8TA00327)						

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Fan	Locked	240	1 hrs 3 min	F1	0.25	All outputs shutdown except +5Vsb, Max. temp. of T1 coil= 124°C, T2 coil=102°C, ambient= 27.2°C, no damage, no hazard.
Ventilation openings	Blocked	240	2 hrs 45 min	F1	2.88	Unit normal operation, temperature was stable, Max. temp. of T1 coil= 120.6°C, T2 coil=114.2°C, ambient= 26.5°C, no damage, no hazard.
T2, (pin 2 to 5)	s-c	240	1 sec	F1	0.12	All outputs shutdown, D43 damage, no hazard. ***2)***
T2, (pin 7 to 8)	s-c	240	30 min	F1	0.16-0.19	Unit cycle protection, no damage, no hazard.
T2, (pin 9 to 10)	s-c	240	30 min	F1	0.16-0.19	Unit cycle protection, no damage, no hazard.
T2 pin 5 (after D43) (+5Vsb)	o-l	240	3 hrs 54 min	F1	2.96	+5Vsb output load 3A, after transformer load CT at 2.7A, increase to 3.7A and unit shutdown except +5Vsb. Max. temp. measured of T1 coil=102°C, T2 coil=96°C, ambient=27.5°C, no damage, no hazard. (Output load Con. A)
+3.3V to +5Vsb	s-c	240	30 min	F1	2.80	Unit normal operation except +5Vsb output voltage become to 3.8V, no damage, no hazard.
+5V to +5Vsb	s-c	240	30 min	F1	2.88	Unit normal operation, no damage, no hazard.
+12V1 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+12V2 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+12V3 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.

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Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
+12V4 to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
-12V to +5Vsb	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+5Vsb output	s-c	240	30 min	F1	0.14	All outputs shutdown, no damage, no hazard.
+5Vsb output	o-l	240	4 hrs 30 min	F1	2.94	CT at 5.5A, maximum increase to 6.5A and other outputs shutdown. Max. temp. of T1 coil=81°C, T2 coil=92°C, ambient=25.5°C, no damage, no hazard. (Output load Con. A)
Supplementary information:						
s-c=Short circuit, o-c=Open circuit, o-l=Over load, CT= Constant temperatures were obtained. - For fault condition test, that the auto range circuit did not constitute a hazard. ***1)*** Fuse current is more than fuse rating times 2.1, for fuse open conditions, same result came out for each source of fuse. (Tests repeated 10 times for UL approved only fuse) ***2)*** Test repeated for 2 times, same result came out.						

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C.2	TABLE: transformers	P

Loc.	Tested insulation	Working voltage peak / V (2.10.2)	Working voltage rms / V (2.10.2)	Required electric strength (5.2)	Required clearance / mm (2.10.3)	Required creepage distance / mm (2.10.4)	Required distance thr. insul. (2.10.5)
T1	Primary windings – Secondary windings	400	227	3000V ac	4.0	5.0	2 layers min. or 0.4 mm
T1	Primary pins – Core – Secondary windings	400	227	3000V ac	4.0	5.0	2 layers min. or 0.4 mm
For T2 type 8TC00207							
T2	Primary windings – Secondary windings	528	345	3000V ac	4.0	7.2 ***1)***	2 layers min. or 0.4 mm
T2	Primary pins – Secondary windings	528	345	3000V ac	4.0	7.2 ***1)***	2 layers min. or 0.4 mm
For T2 type 8TA00327							
T2	Primary windings – Secondary pins ***2), 4)***	520	347	3000V ac	4.4	7.2 ***1)***	2 layers min. or 0.4 mm

Loc.	Tested insulation	Test voltage/ V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers
T1	Primary windings – Secondary windings	3000V ac	10.5	10.5	3 layers
T1	Primary pins – Core – Secondary windings	3000V ac	13.1	13.1	3 layers
For T2 type 8TC00207					
T2	Primary windings – Secondary windings	3000V ac	8.0	8.0	3 layers
T2	Primary pins – Secondary windings	3000V ac	18.0	18.0	3 layers
For T2 type 8TA00327					
T2	Primary windings – Secondary pins ***2), 4)***	3000V ac	8.0	8.0	***3)***

Supplementary information:

****)*** Distance required acc. to IEC 60950-1 first edition for worst case.
1) Linear interpolation is considered.
2) Secondary windings are triple insulated. Core is regarded as a primary part. The creepage distance from prim. winding to core is 0 mm.
3) Triple insulated wire used.
4) Shortest distance is considered.

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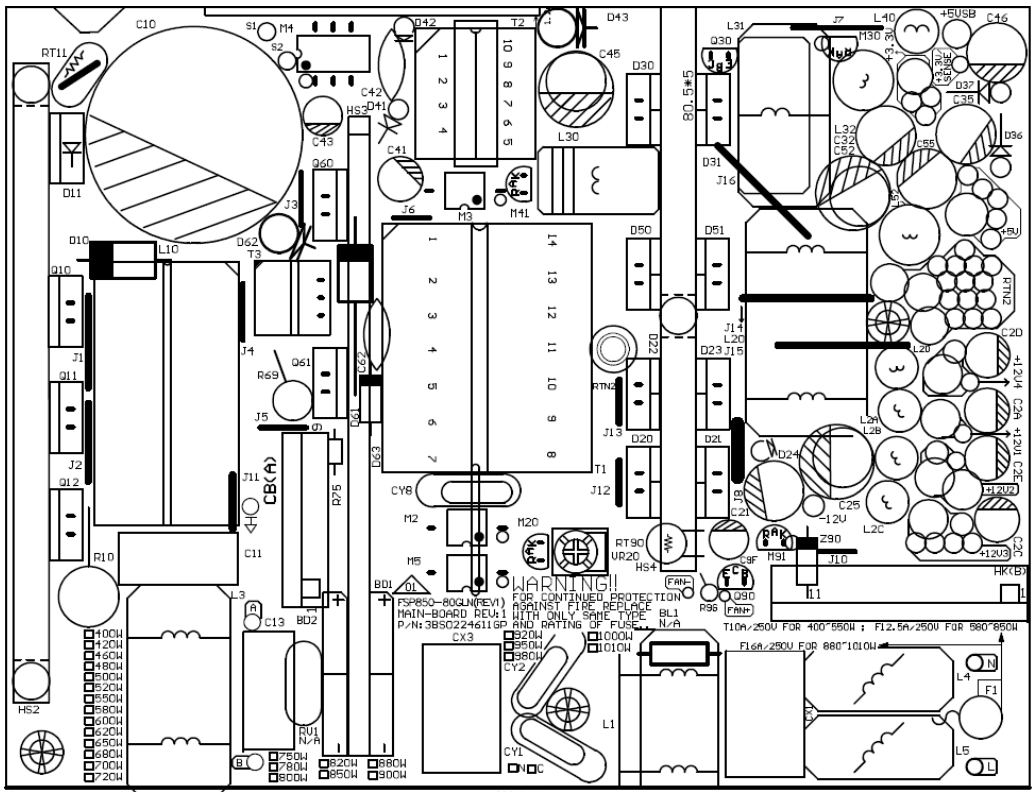
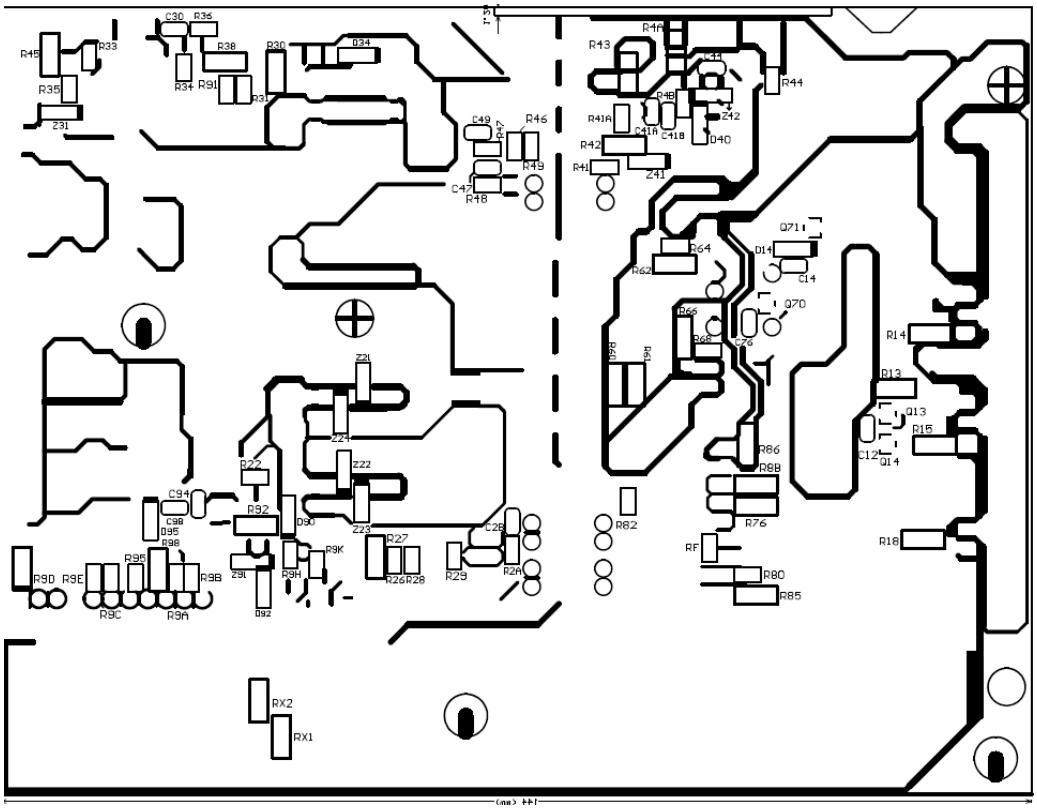
PCB layout

Report No. 139234

Main board





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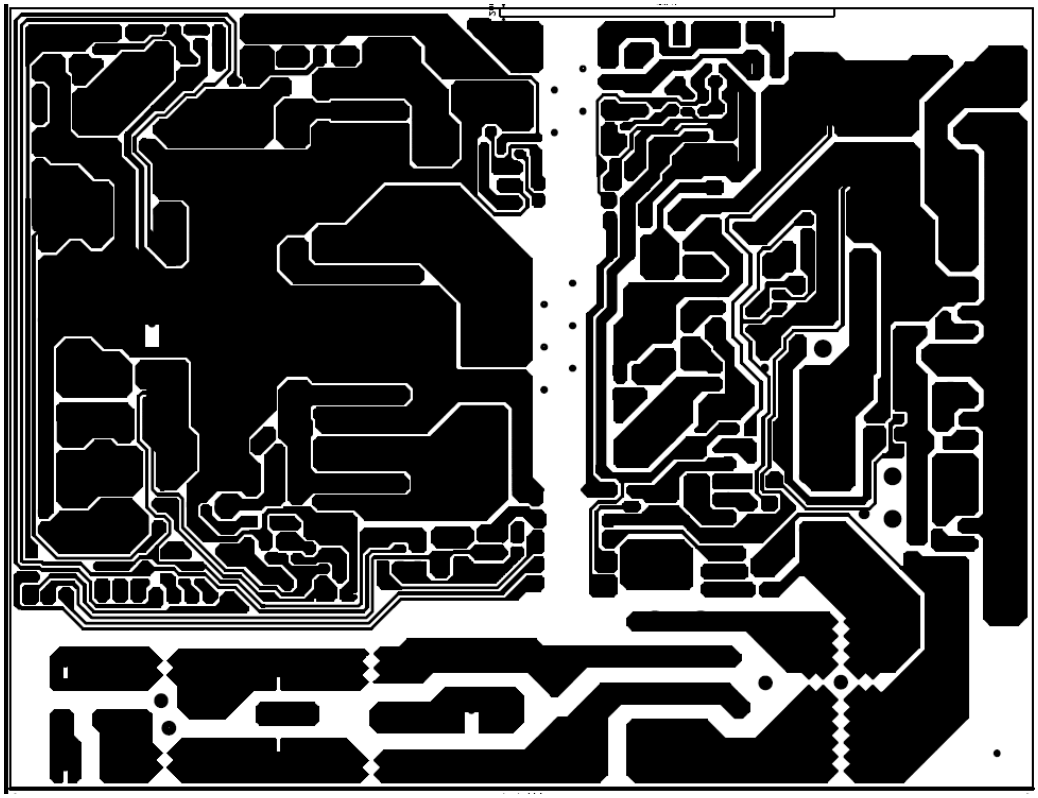
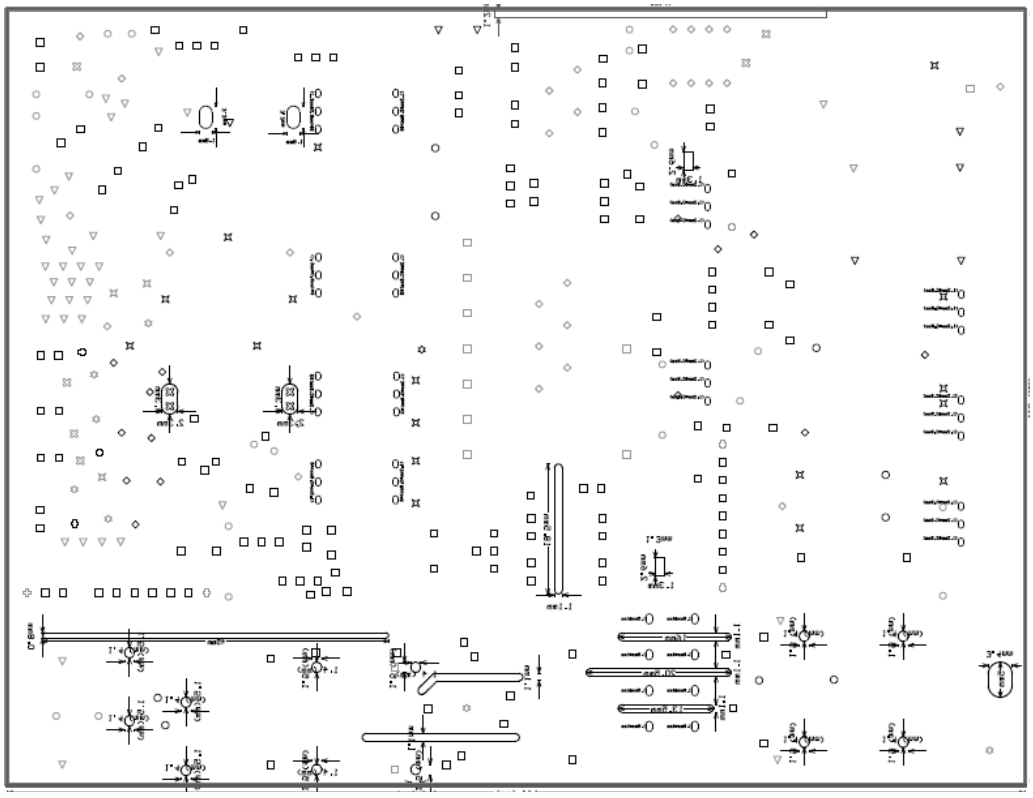
PCB layout

Report No. 139234

Main board





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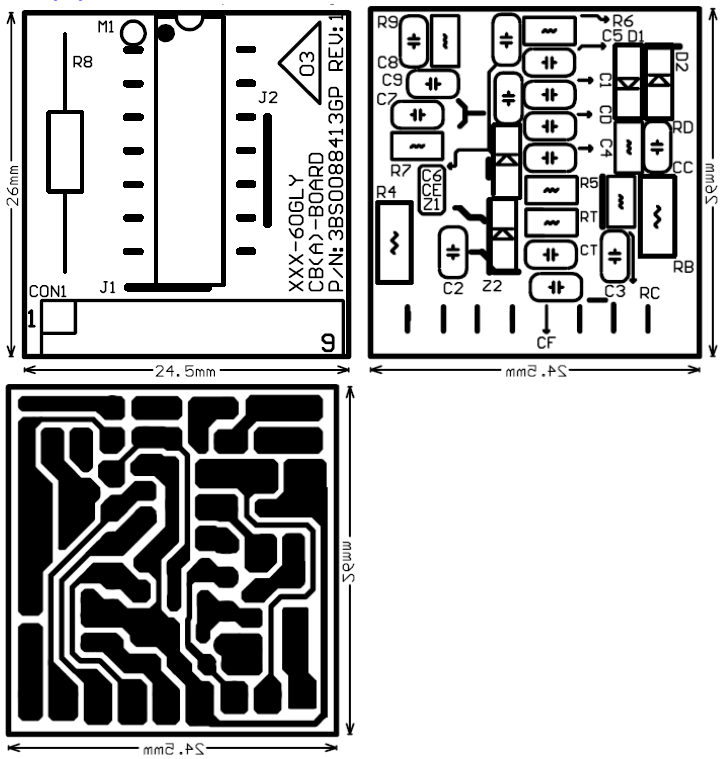
PCB layout

Report No. 139234

CB(A) board



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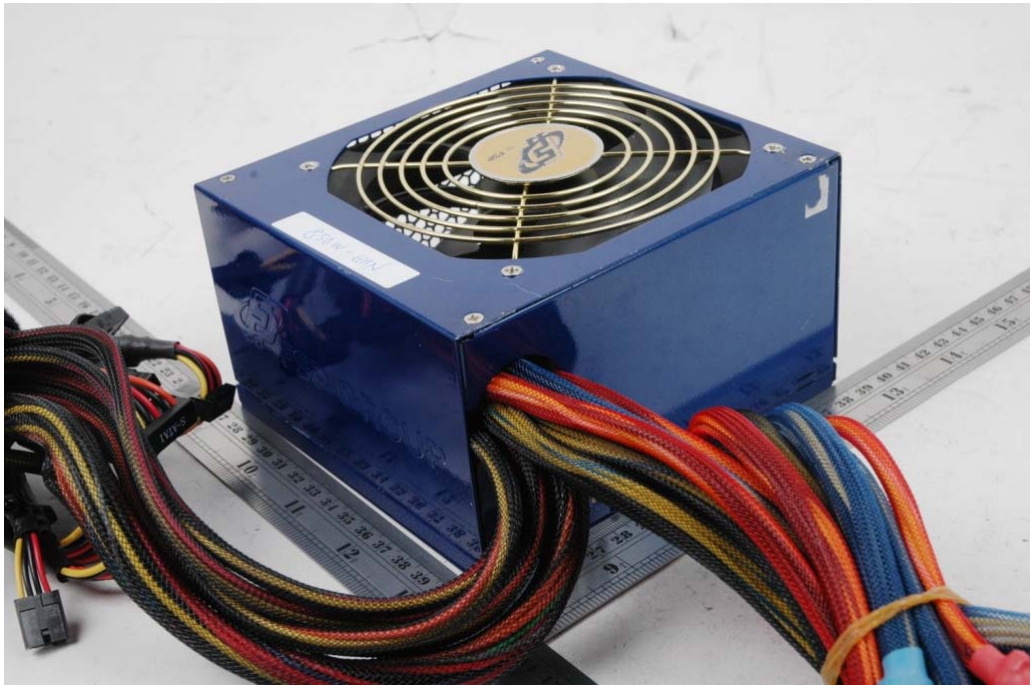
Photos

Report No. 139234

For models FSP.-80GHN(85) used.



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Photos

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For model FSP.-80GCM(85) used.

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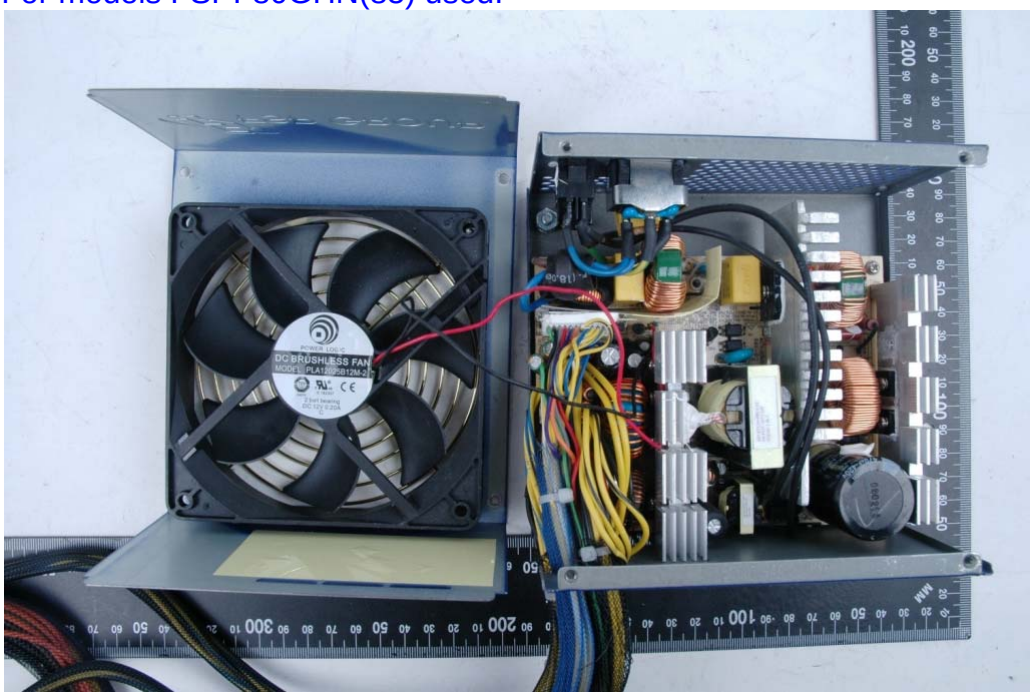
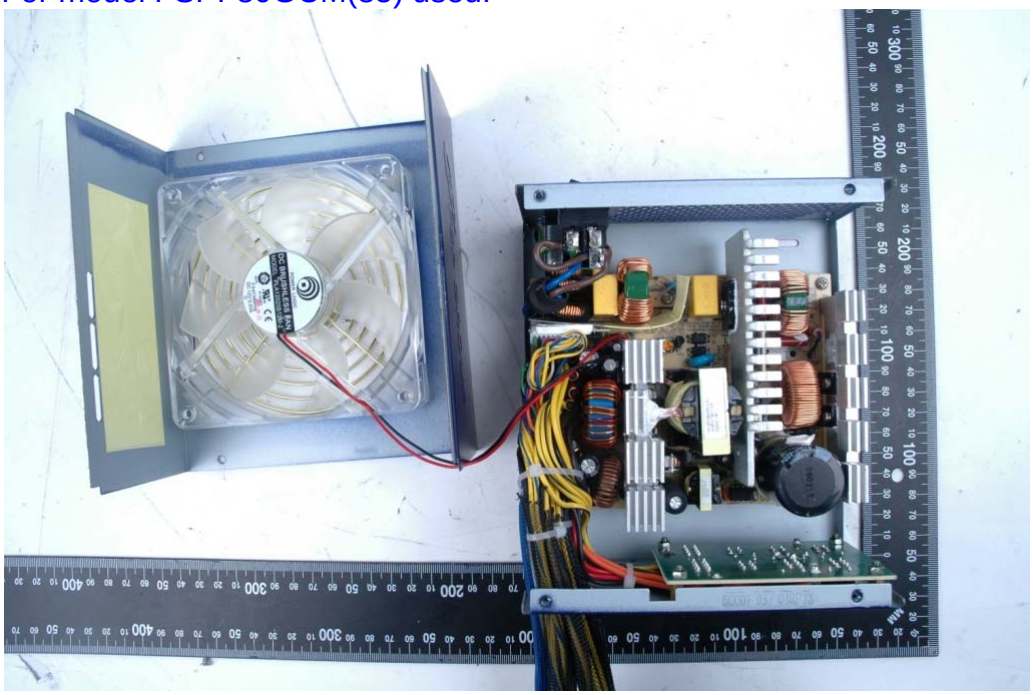
Photos

Report No. 139234

For models FSP.-80GHN(85) used.



For model FSP.-80GCM(85) used.



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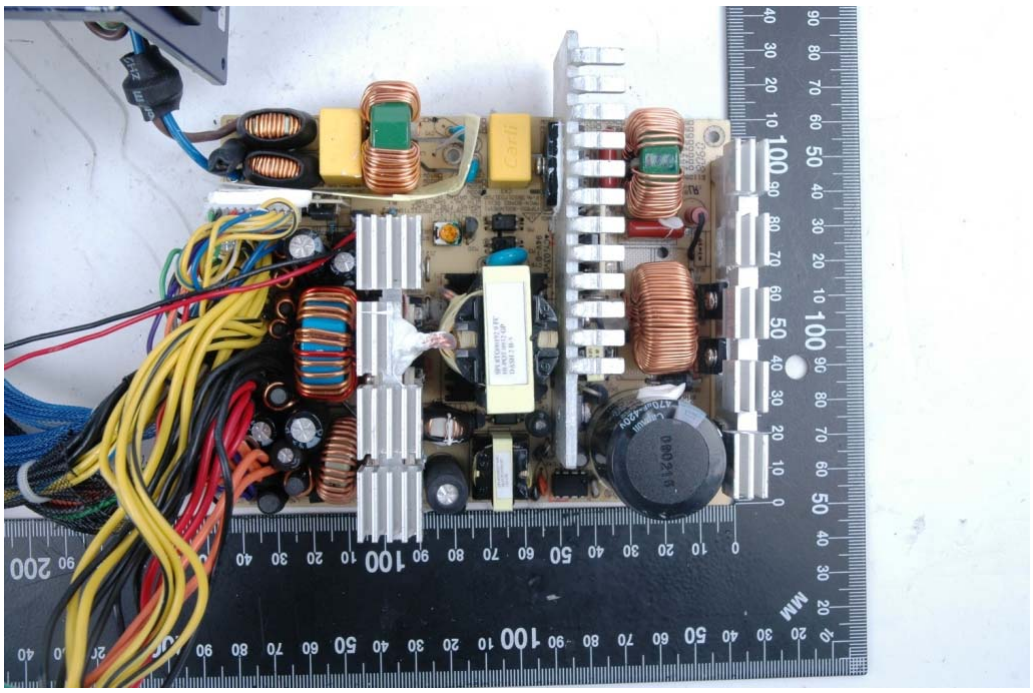
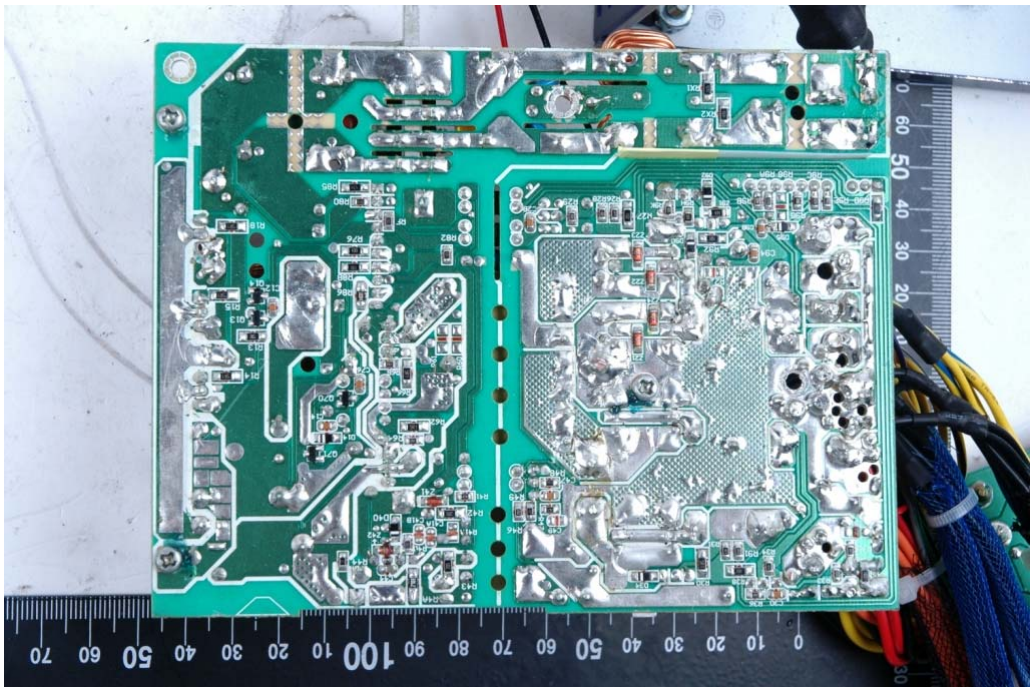
Photos

Report No. 139234

Main board





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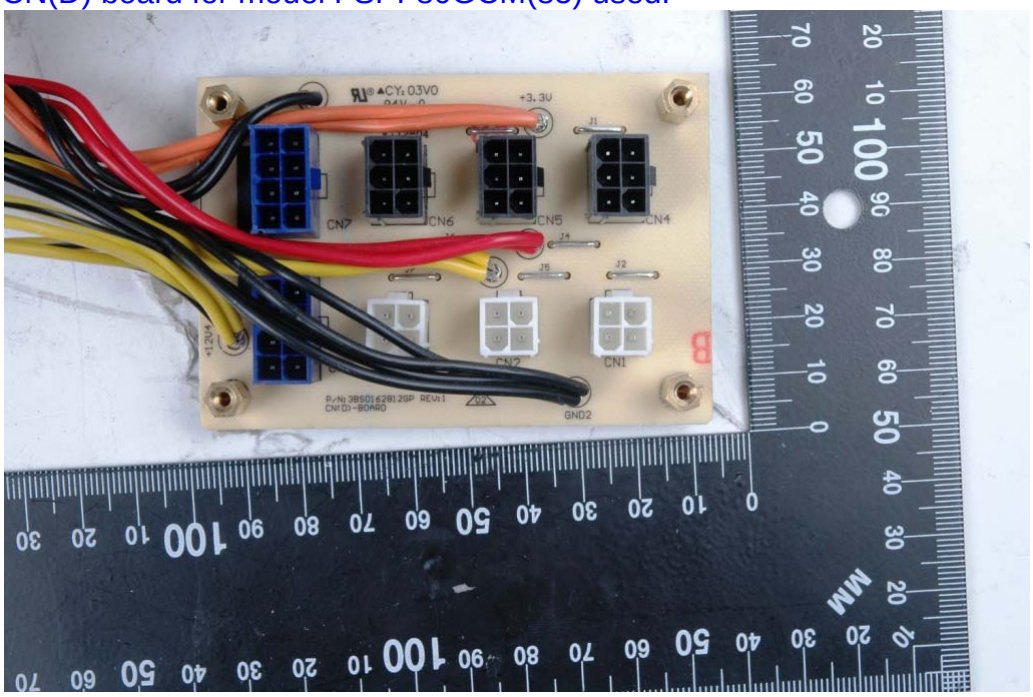
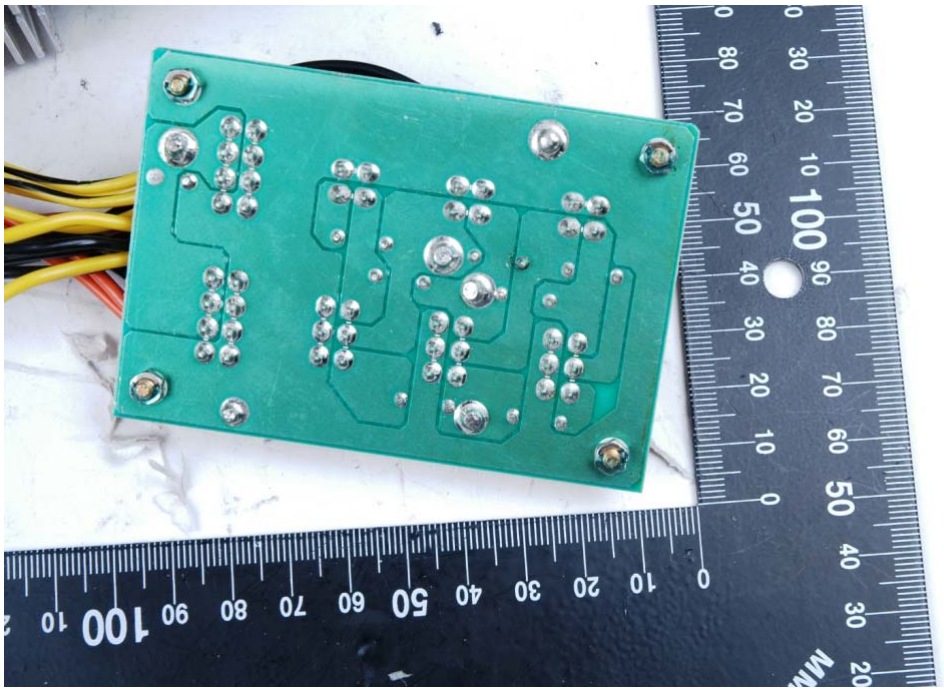
Photos

Report No. 139234

CN(D) board for model FSP.-80GCM(85) used.





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Transformer specification

Report No. 139234

Construction / Winding diagram / Component part no: T1 (type 8TG00192)

全漢企業股份有限公司
FSP GROUP **FSP TECHNOLOGY INC.**

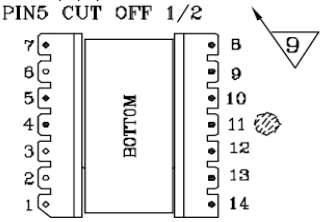
new T1

P/N.:8TG00192

MODEL NO: FSP700-80GLC	TITLE:SPECIFICATION FOR TRANSFORMER.	SHEET: 1 OF 6

1. PIN LOCATION AND CONNECTION

PIN LOCATION (BOTTOM VIEW)
PIN 1,2,3,6 CUT OFF.
PIN5 CUT OFF 1/2



ERL-35

FIGURE-1

CONNECTION (◦ : POLARITY)

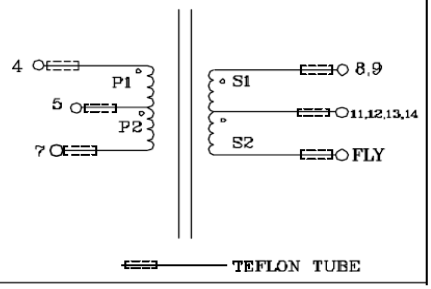


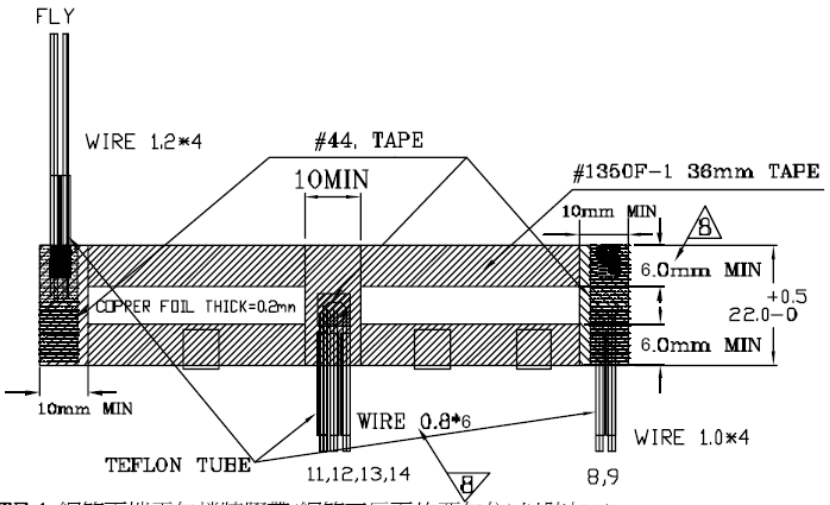
FIGURE-2

2. ELECTRICAL CHARACTERISTICS

2-1 INDUCTANCE,WIND,NUMBER OF TURN,DCR,AND WINDING MATERIALS
TEST VALUE: CHEN HWA 1061 F=20KHz V=0.1Vrms 25°C

WINDING	NO. OF TURNS(S)	WIRE		INDUCTANCE (TP4)	DCR(MAX) m ohms	Q值 MIN	REMARK
		TYPE	DIAMETER				
P1(4-5)	28Ts	2UEW	ø0.7				
S1(8,9-11,12,13,14)	4Ts	COPPER FOIL 0.2*22mm		44.32uH±25%	2.4		
S2(11,12,13,14-FLY)	3Ts	COPPER FOIL 0.2*22mm		24.9uH±25%	2.1		
P2(5-7)	46Ts	2UEW	ø0.7				

2-4 S1,S2 COPPER FOIL ASSEMBLY: UNIT:mm



NOTE:1.銅箔兩端需包擋牆膠帶(銅箔正反面均要包住),以防加工
銅箔後產生的毛刺刺破 TAPE造成短路.擋牆膠帶亦需將焊點貼住
2.繞銅箔時,需在 第1，3，5層的 PIN8至 PIN14重合處(近 PIN端)
各加貼一塊#44 1L*10mm的擋牆膠帶(需包在銅箔正反兩面)

FIGURE-3 8

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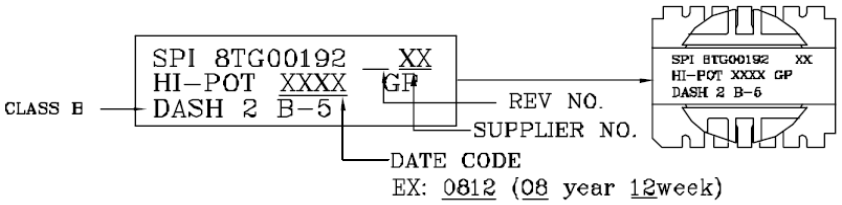
Transformer specification

Report No. 139234

Construction / Winding diagram / Component part no: T1 (type 8TG00192)

6. ADHESIVE, IDENTIFICATION MAKING & DIMENSION



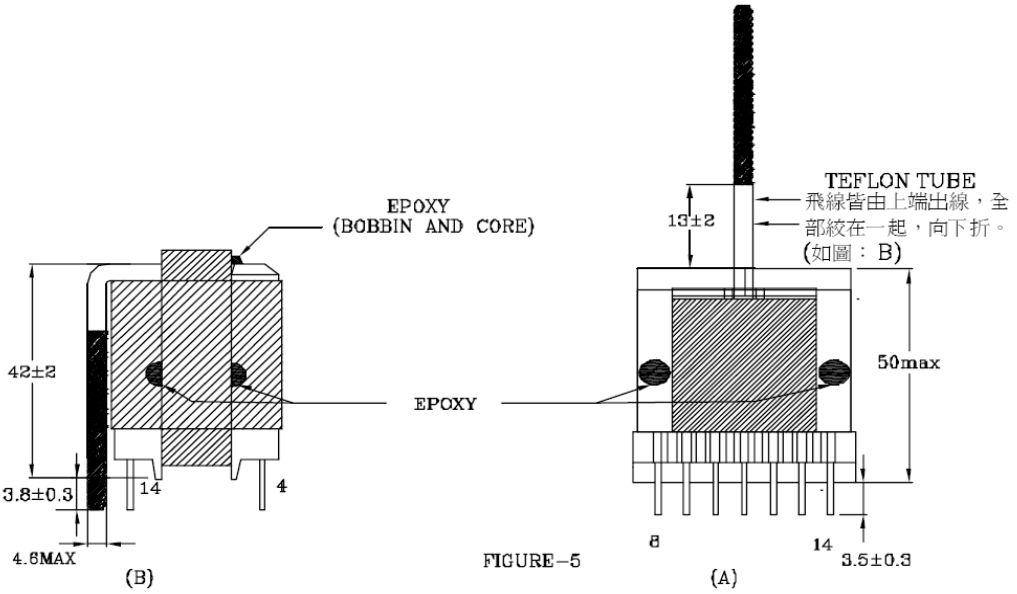


FIGURE-5

注明：1.引線加工圖由A--B.

2.飛線先絞合，後鍍錫，鍍錫長度爲： 40±2

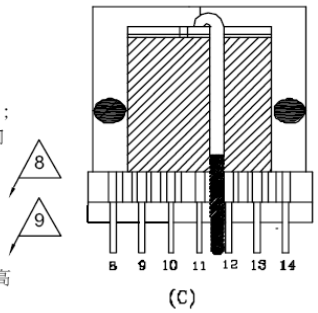
3.飛線出線在 PIN11與PIN12腳中間(如圖 C)

4.此地線彎折時，必須緊貼線包，避免使用時與散熱片干擾；且必須使該地線尾端與 PIN腳齊平,避免過長，導致生產剪腳困難"。

5. 銅箔引線(接11,12,13,14腳)出線時不能從 PIN13-14之間出線,而從 PIN12-13間出線中的一根線需纏繞到 PIN14腳

6. 成品檢查外觀,需特別注意出入腳 TEFLON TUB是否有破損

7.飛線出線時不能直接向下彎腳整形,需從側邊彎下避開線包的最高點,以免飛線會碰到散熱片.



NOTE: EPOXY ADHESIVES SHOULD BE DISPENSED TO INDICATE FIVE AREAS IN FIGURE-5.

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Transformer specification

Report No. 139234

Construction / Winding diagram / Component part no: T1 (type 8TG00192)

5. CONSTRUCTION DETAIL OF INSULATION.

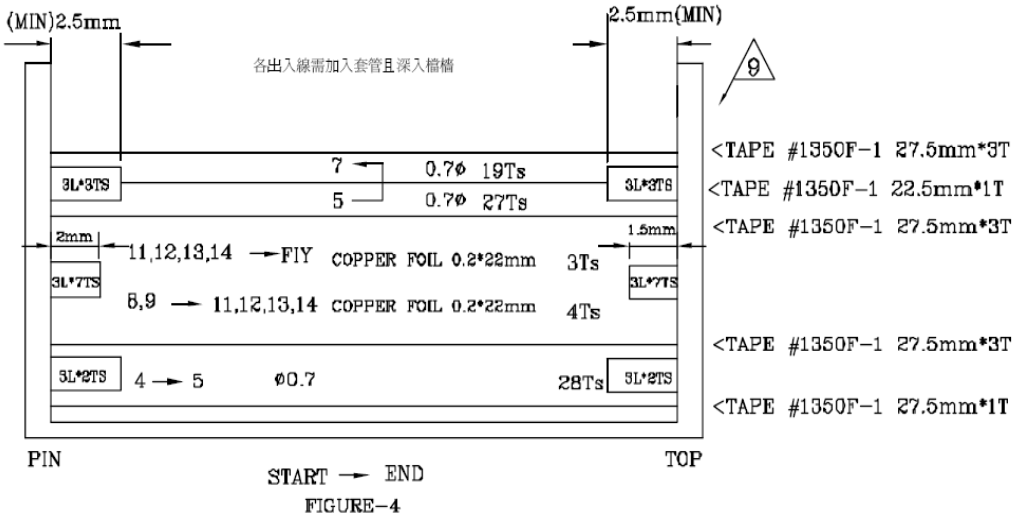

FIGURE-4

DRAWER	DRAWING NO	00192B
BOB	DATE	MAR.19.2008

10. MATERIAL LIST :

NO.	ITEM	MATERIAL	SUPPLIER	UL NO.
1.	BOBBIN	T375J	CHANG CHUN PLASTICS CO. LTD.	E59481(S)
2.	CORE	TP4	ZHEJIANG TIANTONG ELECTRONGICS CO.,LTD	
3.	WIRE	TYPU-130	TA YA ELECTRIC WIRE & CABLE CO LTD.	E84201(S)
		TYA1-130	TA YA ELECTRIC WIRE & CABLE CO LTD.	E84201(S)
		UEWS/U	PACIFIC ELECTRIC WIRE & CABLE CO LTD.	E201757
4.	TAPE	#1350F-1	3M TAIWAN LTD.	E17385
5.	VARNISH	468-2(+)	ELANTAS ELECTRICAL INSULATION ELANTAS PDG INC	E87039
6.	EPOXY	G-9008	GUDAK CHEMISTRY TECH.(D.G)LTD	
7.	MARGIN TAPE	#44	3M TAIWAN LTD.	E17385
8	TLEFON TUBE	TFL	GREAT HOLDING INDUSTRIAL CO., LTD.	E156256
9.	COPPER FOIL	Cu	MINCHALI METAL INDUSTRY CO., LTD.	
		Cu	CHEI LIM INTERPRIST CO., LTD.	

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Transformer specification

Report No. 139234

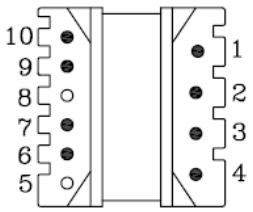
Construction / Winding diagram / Component part no: T2 (type 8TC00207)

全漢企業股份有限公司 T2
FSP GROUP FSP TECHNOLOGY INC. P/N.: 8TC00207

MODEL NO: AX300-PFL01	TITLE: SPECIFICATION FOR TRANSFORMER	SHEET: 1 OF 5

1. PIN LOCATION AND CONNECTION

PIN LOCATION (BOTTOM VIEW)
PIN 5.8 CUT OFF



EEL-19V(10P)

FIGURE-1

CONNECTION (∘ : POLARITY)

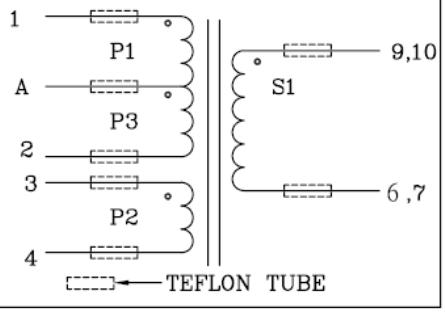


FIGURE-1

2. ELECTRICAL CHARACTERISTICS

2-1 INDUCTANCE, WIND NUMBER OF TURN, DCR AND WINDING MATERIALS
TEST VALUE: CHEN HWA 1061 F=20KHz V=0.1Vrms AT 25°C

WINDING	NO. OF TURN(S)	WIRE TYPE	WIRE DIAMETER	INDUCTANCE	DCR m ohms	Q值 MIN	REMARK
P1 (1-A)	90Ts	2UEW	0.2ø				密繞
S1 (9,10-6,7)	10 11Ts	2UEW	0.8ø	7.47uH ±15%	40		疏繞
P2 (3-4)	33Ts	2UEW	0.3ø	67.2uH ±15%	400		疏繞
P3 (A-2)	90Ts	2UEW	0.2ø				密繞
LP (1-2)	180Ts		0.2ø	2mH ±8%	4500	32	

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Transformer specification

Report No. 139234

Construction / Winding diagram / Component part no: T2 (type 8TC00207)

6. ADHESIVE, IDENTIFICATION MAKING & DIMENSION

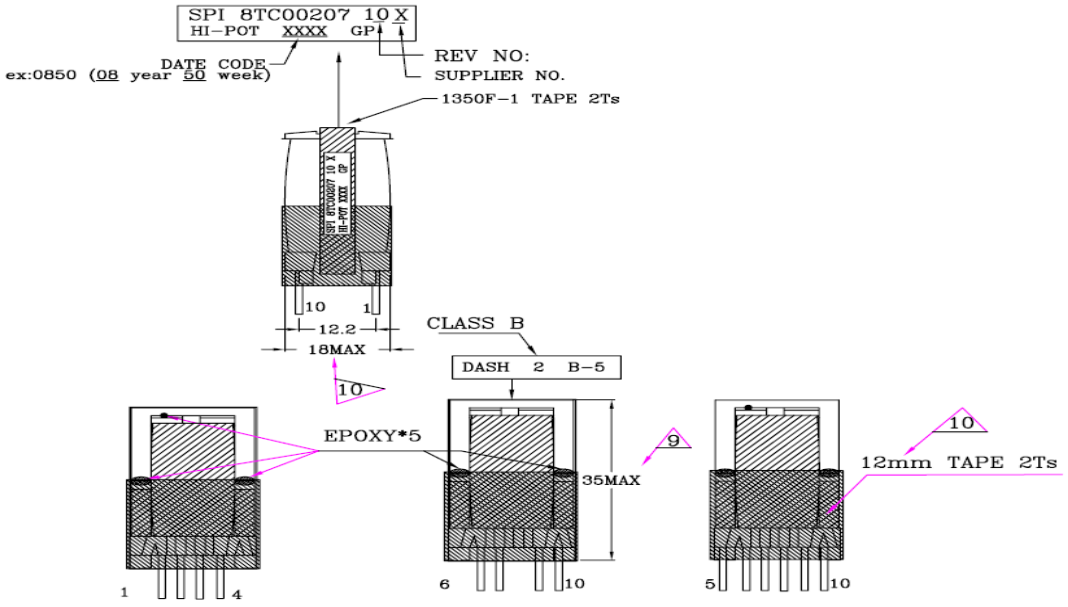
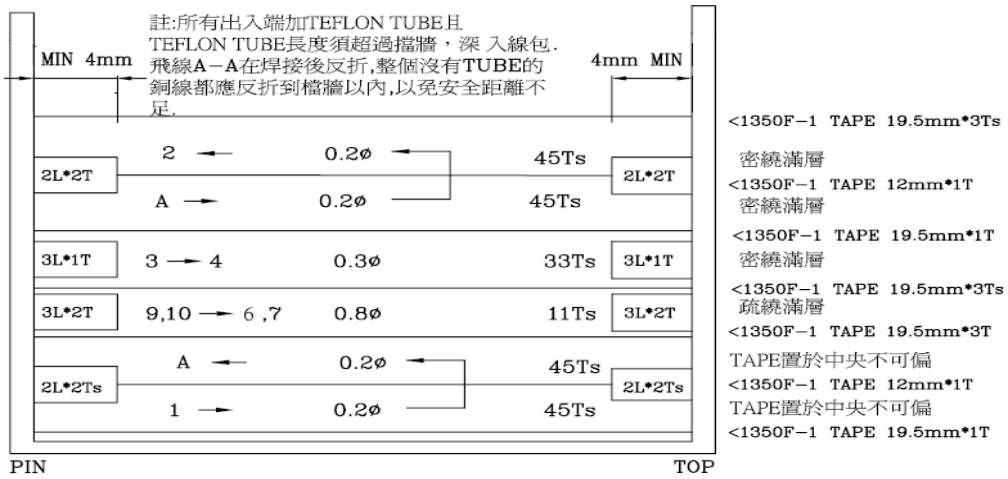


FIGURE-4

NOTE: a. TRANSFORMER MUST BE IMPREGNATED.
b. IT MUST BE BONDING WITH EPOXY G-9008 OF TRANSFORMER ASSEMBLY.
c. MARKING (SEE FIGURE-4).
d.沿本體包外包膠帶1350F-1 12mm 2Ts. 10

5. CONSTRUCTION DETAIL OF INSULATION.



START → END

FIGURE-3

DRAWER	DRAWING NO	00207B
彭淑娟	DATE	DCE.01.2008

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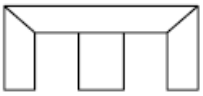
Transformer specification

Report No. 139234

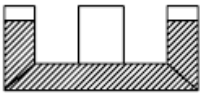
Construction / Winding diagram / Component part no: T2 (type 8TC00207)

NOTE:CORE加工法 9

(a)BOBBIN上方CORE不需包1350F-1 TAPE
(b)BOBBIN下方CORE需包1350F-1 TAPE 10mm(W)*1L



a)BOBBIN上方CORE不需包1350F-1 TAPE



b)BOBBIN下方CORE包1350F-1 TAPE
10mm(W)*1L

10. MATERIAL LIST :

NO.	ITEM	MATERIAL	SUPPLIER	UL NO.
1.	BOBBIN	T375J	CHANG CHUN PLASTICS CO, LTD.	E59481
2.	CORE	P4	ACME ELECTRONICS CO.,LTD	
		PC40	TDK CORPORATION CO., LTD.	
		TP4	ZHEJIANG TIANTONG ELECTRONGICS CO.,LTD	
3.	WIRE	TYPU-130	TA YA ELECTRIC WIRE & CABLE CO LTD.	E84201
		TYA1-130	TA YA ELECTRIC WIRE & CABLE CO LTD.	E84201
		UEWS/U	PACIFIC ELECTRIC WIRE & CABLE CO LTD.	E201757
4.	TAPE	1350F-1	3M TAIWAN LTD.	E17385
5.	EPOXY	G-9008	GUDAK CHEMISTRY TECH.(D.G)LTD	
6.	MARGIN TAPE	#44	3M COMPANY	E17385
7.	TEFLON TUBE	TFL	GREAT HOLDING INDUSTRIAL CO., LTD.	E156256
8.	VARNISH	468-2(x)	ELANTAS ELECTRCAL INSULATION ELANTAS PDG INC	E75225

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Transformer specification

Report No. 139234

Construction / Winding diagram / Component part no: T2 (type 8TA00327)

FSP GROUP 全漢企業股份有限公司 FSP TECHNOLOGY INC.

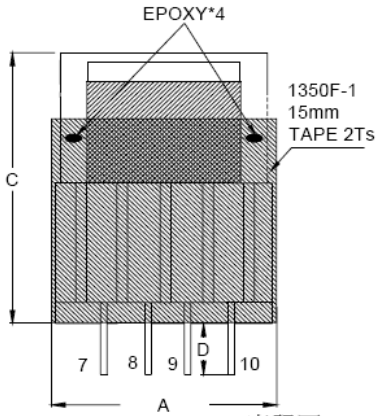
T2

P/N:8TA00327

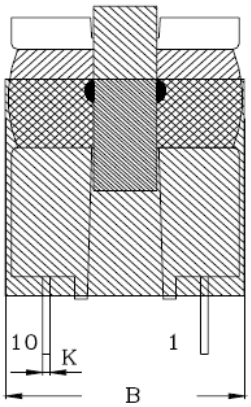
MODEL NO: FSP400-60HHN	TITLE : SPECIFICATION FOR TRANSFORMER	SHEET : 2 OF 6

二.PHYSICAL DIMENSION (外觀尺寸圖):

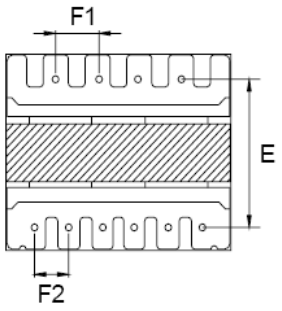
FRONT VIEW(主視圖)



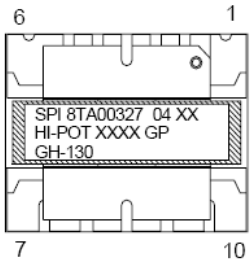
SIDE VIEW(側視圖)



BOTTOM VIEW(底視圖)



TOP VIEW(頂視圖)



DIMENSION	A	B	C	D	E	F1*3	F2*5	K				UNIT
	MAX	MAX	MAX	±0.3	±0.3	±0.2	±0.2	±0.1				mm
SPEC	21	17	23.5	3.8	12	3.5	2.7	Φ0.6				mm

NOTE(注意事項)

1. 按上圖所示點 4 點黑膠固定, 並烘乾.
2. Core 用 TAPE 包二圈固定,含浸后不用拆除.
3. Core 需磨 GAP.
4. 成品要真空含浸凡立水.
5. 成品外圍包 1350F-1 15mm TAPE 兩圈(膠帶平齊擋板底部但不超出擋板以免插件時不出腳)

DRAWER	DATE
BOB	JAN.08.2010

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Transformer specification

Report No. 139234

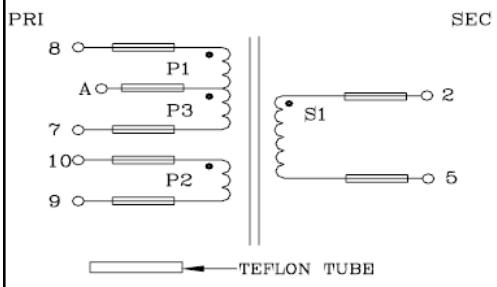
Construction / Winding diagram / Component part no: T2 (type 8TA00327)

FSP GROUP FSP TECHNOLOGY INC.

P/N:8TA00327

MODEL NO: FSP400-60HHN	TITLE: SPECIFICATION FOR TRANSFORMER	SHEET : 3 OF 6

三.SCHEMATIC:(線路圖)



四.WINDING:(剖面圖)

五..WINDING TABLE(繞線結構表):

Winding 繞組	Pin 腳位	Wire 線材 Diameter 線徑	Wire 線材 Type 線種	Turns 圈數	Margin Tape 檔牆膠帶	Tape Layer 膠帶層數	Winding Method 繞線方式	Remark 備注
P1	8--A	Φ0.2*1	2UEW	66 Ts		9.0mm*2L	兩層密繞	層間絕緣
P2	10--9	Φ0.25*1	2UEW	28Ts		9.5mm*1L	密繞	
S1	2--5	Φ0.7*1	TRW(B)	9Ts		9.5mm*2L	密繞	
P3	A--7	Φ0.2*1	2UEW	82 Ts		9.5mm*3L	三層密繞	層間絕緣

NOTE:(注意事項)

1. 拔掉 PIN 1,3,4,6
2. 繞完 P3 後先包一圈 TAPE,再將抽頭 A-A 短接並反折進線包,且短接處需用 TAPE 包住
3. 繞線前，空 BOBBIN 需打底兩圈膠帶.
4. P2 上面繞組的層間及組間膠帶均用 1350F-1*9.5(W)mm

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Transformer specification

Report No. 139234

Construction / Winding diagram / Component part no: T2 (type 8TA00327)

八.MATERIAL LIST(材料表)：

NO. 序	ITEM 品名	MATERIAL 材質	SUPPLIER 供 應 商	UL NO
1	BOBBIN	T375J	CHANG CHUN PLASTICS CO.,LTD.	E59481(S)
2	CORE	PC40	TDK CORPORATION CO., LTD	
		P4	ACME ELECTRONICS CORPORATION	
3	WIRE	UEWN/U	PACIFIC ELECTRIC WIRE &CABLE (SHENZHEN)CO., LTD	E201757
		UEWS/U		
		UEW-U	SIAM PACIFIC ELECTRIC WIRECO.,LTD	E196993
		TYA1-130	TA YA ELECTRIC WIRE&CABLE CO.,LTD	E84201
		TYPU-130	TA YA ELECTRIC WIRE FACTORY	E197768
4	TAPE	1350F-1	3M COMPANY	E17385
5	TEFLON TUBE	TFL	GREAT HOLDING INDUSTRIAL CO.,LTD	E156256
		CB-TTL	CHANG YUAN ELECTRONICS(SHENZHEN)CO.,LTD	E180908
6	VARNISH	BC-346A	JOHN C. DOLPH CO	E317427
7	EPOXY	G-9008	GUDAK CHEMISTRY TECH CO., LTD	
8	TRIPLE WIRE	TRW(B)	GREAT LEOFLON INDUSTRIAL CO LTD	E211989

DRAWER	DATE
蔡 文	DEC.26.2008

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Report No. 139234

ATTACHMENT: KOREAN DIFFERENCES
Test results according to CB BULLETIN No. 112A, December 2006

Clause	Requirements – Test	Result – Remark	Verdict
1.5.101	Addition Plugs for the connection of the apparatus to the supply mains shall comply with the Korean requirement (KSC 8305 and 8305).	Refer to Summary Of Testing in main test report.	**N**
8	Addition EMC The apparatus shall comply with the relevant CISPR standards.	The power supply has not been tested for EMC, the end product must be tested with this power supply installed. refer to Summary of Testing in main test report.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict

National Differences for Canada			**P**
Canada and the United States of America have adopted a single, bi-national standard, CAN/CSA C22.2 No. 60950-1/UL60950-1, Second Edition, which is based on IEC 60950-1, Second Edition. This bi-national standard should be consulted for further details on the national conditions and differences summarized below.			
SPECIAL NATIONAL CONDITIONS The following is a summary of the key national differences based on national regulatory requirements, such as the Canadian Electrical Code (CEC) Part and the Canadian Building Code, which are referenced in legislation and which form the basis for the rules and practices followed in electrical and building installations.			
1.1.1	All equipment is to be designed to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, unless marked or otherwise identified, installation is allowed per the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.	Considered.	**P**
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A .....:	Equipment acceptable for connection to 20 A	**P**
1.5.5	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 CEC/NEC. .....:	External interconnecting flexible cable (sec. O/P cable) is not longer than 3.05m.	**N**
	For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the CEC/NEC are required to have special construction features and identification markings.	Considered.	**P**
1.7.1	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.	Only one phase conductor.	**N**
	A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and if it is part of a range that extends into the Table 2 "Normal Operating Conditions." Likewise, a voltage rating shall not be lower than the specified "Normal Operating Conditions," unless it is part of a range that extends into the "Normal Operating Conditions."	Refer to Summary Of Testing in main test report.	**N**
1.7.7	Wiring terminals intended to supply Class 2 outputs in accordance with CEC Part 1 or NEC shall be marked with the voltage rating and “Class 2” or equivalent. Marking shall be located adjacent to the terminals and shall be visible during wiring.	No connectors and wiring terminal for external Class 2 circuit.	**N**
2.5	Where a fuse is used to provide Class 2, Limited Power Source, or TNV current limiting, it shall not be operator-accessible unless it is not interchangeable.	No such fuse used.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
2.7.1	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. Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require special transformer overcurrent protection.	No standard supply outlets, receptacles, lampholders or such transformers.	**N**
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains shall be in accordance with the NEC/CEC.	The equipment is provided with an appliance inlet.	**N**
3.2.1	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	Refer to Summary Of Testing in main test report.	**N**
3.2.1.2	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, is required to comply with special earthing, wiring, marking and installation instruction requirements.	The equipment is not for connection to a DC mains supply.	**N**
3.2.3	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.	The equipment is not permanently connected to the mains.	**N**
3.2.5	Power supply cords are required to be no longer than 4.5 m in length. ..... Flexible power supply cords are required to be compatible with Tables 11 and 12 of the CEC and Article 400 of the NEC.	Refer to Summary Of Testing in main test report.	**N**
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	The equipment is not permanently connected to the mains.	**N**
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CSA C22.2 No. 0.	The equipment is provided with an appliance inlet.	**N**
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm2).	The equipment is provided with an appliance inlet.	**N**
3.3.4	Terminals for permanent wiring, including protective earthing terminals, are required to be suitable for Canadian/US wire gauge sizes, rated 125 percent of the equipment rating, and be specially marked when specified (1.7.7).	No permanent wiring. The equipment is provided with an appliance inlet.	**N**
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the equipment is rated more than 12 A, or if the motor has a nominal voltage rating greater than 120 V, or is rated more than 1/3 hp (locked rotor current over 43 A).	No AC motors in the equipment.	**N**
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.	No such switch used.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
3.4.11	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the computer room remote power-off circuit.	No battery in the equipment.	**N**
	Battery system: ..... When power-off is activated:		—
4.3.12	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.	No flammable liquids within the equipment.	**N**
	Flammable liquid material: ..... Flash point: ..... Boiling point: ..... Container material: ..... Storage container size:		—
4.3.13.5	Equipment with lasers is required to meet the Canadian Radiation Emitting Devices Act, REDR C1370 and/or Code of Federal Regulations 21 CFR 1040, as applicable.	No laser or LED.	**N**
4.7	For computer room applications, automated information storage systems with combustible media greater than 0.76 m^3 (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.	The equipment has no combustible area greater than 0.76 m^3.	**N**
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m^2 (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less.	The equipment has no combustible material greater than 0.9m^2 or single dimension greater than 1.8m.	**N**
Annex H	Equipment that produces ionizing radiation is required to comply with the Canadian Radiation Emitting Devices Act, REDR C1370 and/or Code of Federal Regulations, 21 CFR 1020, as applicable.	The equipment does not produce ionizing radiation.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
OTHER DIFFERENCES The following key national differences are based on requirements other than national regulatory requirements.			
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (Canadian and/or U.S.) component or material standard requirements. These components include: attachment plugs, battery packs (rechargeable type, used with transportable equipment), cathode ray tubes, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), cord sets and power supply cords, direct plug-in equipment, enclosures (outdoor), flexible cords and cables, fuses (branch circuit), fuseholders, ground-fault current interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring, protectors for communications circuits, receptacles, solid state controls, supplementary protectors, switches (including interlock switches), thermal cutoffs, thermostats, (multi-layer) transformer winding wire, transient voltage surge suppressors, tubing, wire connectors, and wire and cables.	Critical components are IEC certified. See list of critical components in main CB report (§1.5.1). There may be additional requirements for components in Canada.	**P**
1.6.1.2	A circuit for connection to the DC Mains Supply is classified as either a SELV Circuit, TNV-2 Circuit or Hazardous Voltage Circuit depending on the maximum operating voltage of the supply. This maximum operating voltage shall include consideration of the battery charging “float voltage” associated with the intended supply system, regardless of the marked power rating of the equipment.	No connect to DC power distribution system.	**N**
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vpeak or 60 Vd.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.	No TNV circuitry.	**N**
2.3.2.1	In the event of a single fault between TNV and SELV circuits, SELV Circuits and accessible conductive parts comply with the North American limits of 2.2.3.	No TNV circuitry.	**N**
2.6.3.4	Protective bonding conductors of non-standard protective bonding constructions (e.g., printed circuit traces) subjected to the additional limited short circuit test conditions specified, if required.	Considered, see main test report.	**P**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.8.1	Enclosures around CRTs with a face diameter of 160 mm or more are provided with suitable enclosure to reduce the risk of injury due to the implosion of the CRT.	No CRTs in the equipment.	**N**
	Projected area of opening ..... : Minor dimension of projected area ..... :		—
4.2.11	For equipment intended for mounting on racks and provided with slide/rails allowing the equipment to slide away from the rack for installation, service and maintenance, additional construction, performance and marking requirements are applicable to determine the adequacy of the slide/rails.	No mounting on racks and provided with slide/rails.	**N**
4.3.2	Equipment with handles is required to comply with special loading tests.	No handle.	**N**
5.1.8.3	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	No TNV circuitry.	**N**
	Ringing ports provided: ..... Simulation provided to: ..... Measured total touch current :		—
5.3.7	Internal (e.g., card cage) SELV circuit connectors and printed wiring board connectors that are accessible to the operator and that deliver power are to be overloaded. During abnormal operating testing, if a circuit is interrupted by the opening of a component, the test shall be repeated twice (three tests total) using new components as necessary.	Considered.	**P**
6.4	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses in accordance with 6.4 and Annex NAC.	No TNV circuitry.	**N**
M.2	Continuous ringing signals up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.	No TNV circuitry.	**N**
Annex NAD	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.	No TNV circuitry.	**N**
Annex NAF	Document (paper) shredders likely to be used in a home or home office (Pluggable Equipment Type A plug configuration) are required to comply with additional requirements, including markings/instructions, protection against inadvertent reactivation of a safety interlock, disconnection from the mains supply (via provision of an isolating switch), and protection against operator access (accessibility determined via new accessibility probe & probe/wedge).	Not applicable.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
Annex NAF **Household/home office Document shredders**			**N**
NAF1.7	Markings and Instructions	The equipment is not a shredders.	**N**
NAF 1.7.15	Symbols alerting the user to the following considerations are provided adjacent to the document feed opening. These symbols are explained in the instructions:		**N**
	Product is not intended for use by children (product is not a toy) .....:		**N**
	Avoid touching the document feed opening with hands .....:		**N**
	Avoid clothing touching the document feed opening .....:		**N**
	Keep aerosol products away (applicable for product with brush motor only) .....:		**N**
	The ⚠ (ISO 7000-0434) symbol to alert user to important operating, maintenance and/or servicing instructions and the explanation of above symbols		**N**
	Marking is permanent, comprehensible and easily discernible on the equipment.		**N**
NAF 2.8.3	Safety interlock can not be activated by articulated accessibility probe (NAF.1)		**N**
NAF 3.4	Isolation switch complying with 3.4.2 is provided to disconnect power to hazardous moving parts		**N**
	On/off marking is provided for two position switch..:		**N**
	Off marking for multi-position switch .....:		**N**
NAF 4.4	Protection against hazardous moving parts		**N**
	Accessibility probe (Fig NAF.1) is inserted without force into each opening and did not contact hazardous moving parts		**N**
	Operator accessible guards are removed and Accessibility wedge is inserted into each opening according without contacting mechanical hazards:		**N**
	Strip-cut (45N): .....:		—
	Cross-cut (90N).....:		—

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
USA - Differences to IEC 60950-1:2005, Second Edition			**P**
1.1	Equipment able to be installed in accordance with the National Electrical Code ANSI/NFPA 70	Considered.	**P**
1.1.1	Equipment able to be installed in accordance with ANSI/NFPA 75 and NEC Art. 645 unless intended for use outside of computer room and provided with such instructions.	Considered.	**P**
1.1.2	Equipment in wire-line communication facilities serving high-voltage electric power stations operating at greater than 1kV are excluded.	Considered.	**P**
1.1.2	Equipment intended for outdoor use	Not outdoor use equipment.	**N**
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20 A.	Considered.	**P**
1.5.1	All IEC standards for components identified in Annex P.1 replaced by the relevant requirements of UL component standards in Annex P.1.	Considered, see appended table 1.5.1 in the main test report.	**P**
1.5.1	All IEC standards for components identified in Annex P.2 alternatively satisfied by the relevant requirements of UL component standards	Considered, see appended table 1.5.1 in the main test report.	**P**
1.5.5	Interconnecting cables acceptable for the application regarding voltage, current, temperature, flammability, mechanical serviceability and the like.	Considered.	**P**
1.5.5	For other than limited power and TNV circuits, the type of output circuit identified for output connector.	Considered.	**P**
1.5.5	External cable assemblies that exceed 3.05 m in length to be types specified in the NEC	External interconnecting flexible cable (sec. O/P cable) is not longer than 3.05m.	**N**
1.5.5	Detachable external interconnecting cables 3.05 m or less in length and provided with equipment marked to identify the responsible organization and the designation for the cable	Refer to Summary Of Testing in main test report.	**N**
1.5.5	Building wiring and cable for use in ducts, plenums and other air handling space subject to special requirements and excluded from scope.	No such wire used.	**N**
1.5.5	Telephone line and extension cords and the like comply with UL 1863	No TNV circuitry.	**N**
1.6.1.2	Equipment intended for connection to a d.c. power (mains) distribution system subjected to special circuit classification requirements (e.g., TNV-2)	No connect to DC power distribution system.	**N**
1.6.1.2	Earthing of d.c. powered equipment provided	No connect to DC power distribution system.	**N**
1.7	Lamp replacement information indicated on lampholder in operator access area	No lamp provided.	**N**
1.7.1	Special marking format for equipment intended for use on a supply system with an earthed neutral and more than one phase conductor	Single phase only.	**N**
1.7.1	Equipment voltage rating not higher than rating of	No plug provided.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
	the plug except under special conditions		
1.7.6	Fuse replacement marking for operator accessible fuses	No operator accessible fuses.	**N**
1.7.7	Identification of terminal connection of the equipment earthing conductor	Appliance inlet provided, marking of the protective earthing terminal is not applicable.	**N**
1.7.7	Connectors and field wiring terminals for external Class 2 or Class 3 circuits provided with marking indicating minimum Class of wiring to be used.	No connectors and field wiring terminal for external Class 2 or Class 3 circuits.	**N**
1.7.7	Marking located adjacent to terminals and visible during wiring	No such terminal used.	**N**
2.1.1.1	Bare TNV conductive parts protected by a cover are exempt if instructions include directions for disconnection of TNV prior to removal of the cover	No TNV circuitry.	**N**
2.3.1.b	Other telecommunication signaling systems than described in 2.3.1(b) are subject to M.4.	No TNV circuitry.	**N**
2.3.1.b	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vp or 60 V d.c., the max. current limit through a resistor ≥ 2000 Ohm with loads disconnected is 7.1 mA peak or 30 mA d.c. under normal conditions	No TNV circuitry.	**N**
2.3.1.b	Limits for measurements across 5000 Ohm resistor in the event of a single fault are replaced after 200 ms with the limits of M.3.1.4.	No TNV circuitry.	**N**
2.3.2.1	For a single fault, the limits of 2.2.3 apply to SELV circuits and accessible conductive parts.	No TNV circuitry.	**N**
2.3.2.4	Enamel coating on signal transformer winding wire allowed as an alternative to Basic insulation in specific telecommunication applications if subject to special construction requirements and testing	No TNV circuitry.	**N**
2.5	Overcurrent protection device required for Class 2 and Class 3 limiting according to the NEC, or for a Limited Power Source, not interchangeable with devices of higher ratings if operator replaceable	No such component provided.	**N**
2.6	Equipment having receptacles for output a.c. power connectors generated from an internal separately derived source have the earthed (grounded) circuit conductor suitably bonded to earth.	No receptacles for output a.c. power connectors.	**N**
2.6.3.3	For Pluggable Equipment Type A, if a) b) or c) are not applicable, the current rating of the circuit is taken as 20 A	Considered, see main test report.	**P**
2.6.3.4	Capacity of connection between earthing terminal and parts required to be earthed subject to special conditions based on the current rating of the circuit.	Considered, see main test report.	**P**
2.6.4.1	Field wiring terminals for earthing conductors suitable for wire sizes (gauge) used in US	Provide appliance inlet.	**N**
2.7.1	Data for selection of special external branch circuit overcurrent devices marked on the equipment	No such part.	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
2.7.1	Standard supply outlets protected by overcurrent device in accordance with the NEC	No such part.	**N**
2.7.1	Overcurrent protection for individual transformers that distribute power to other units over branch circuit wiring	No such part.	**N**
2.7.1	Additional requirements for overcurrent protection apply to equipment provided with panelboards	No such part.	**N**
2.7.1	Non-motor-operated equipment requiring special overcurrent protective device marked with device rating.	No such part.	**N**
2.10.5.12	Multi-layer winding wire subject to UL component wire requirements in addition to 2.10.5.12 and Annex U.	Considered, see main test report.	**P**
3.1.1	Permissible combinations of internal wiring/external cable sizes for overcurrent & short circuit protection	Considered.	**P**
3.1.1	All interconnecting cables protected against overcurrent and short circuit.	Considered	**P**
3.2	Wiring methods permit connection of equipment to primary power supply in accordance with the NEC	The equipment is provided with an appliance inlet.	**N**
3.2.1	Permitted use for flexible cords and plugs.	Refer to Summary Of Testing in main test report.	**N**
3.2.1	Flexible cords provided with attachment plug rated 125% of equipment current rating.	Refer to Summary Of Testing in main test report.	**N**
3.2.1	Any Class II equipment provided with 15 or 20 A standard supply outlets, Edison-base lampholders or single pole disconnect device provided with a polarized type attachment plug.	Class I equipment.	**N**
3.2.1.2	Equipment intended for connection to DC mains supply power systems complies with special wiring requirements	The equipment is not for connection to a DC. mains supply.	**N**
3.2.1.2	Equipment with one pole of the DC mains supply connected to both the equipment mains input terminal and the main protective earthing terminal provided with special instructions and construction provisions for earthing	The equipment is not for connection to a DC. mains supply.	**N**
3.2.1.2	Equipment with means for connecting supply to earthing electrode conductor has no switches or protective devices between supply connection and earthing electrode connection.	The equipment is not for connection to a DC. mains supply.	**N**
3.2.1.2	Markings and instructions for equipment with provisions to connect earthed conductor of a DC supply circuit to the equipment earthing conductor	The equipment is not for connection to a DC. mains supply.	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.2	Special markings and instructions for equipment with earthed conductor of a DC supply circuit connected to the equipment earthing conductor	The equipment is not for connection to a DC. mains supply.	**N**
3.2.1.2	Terminals and leads provided for permanent connection of DC powered equipment to supply marked to indicate polarity if reverse polarity may result in a hazard.	The equipment is not for connection to a DC. mains supply.	**N**
3.2.3	Permanently connected equipment has provision for connecting and securing a field wiring system (i.e. conduit, or leads etc.) per the NEC	Not permanently connected equipment.	**N**
3.2.3	Permanently connected equipment may have terminals or leads not smaller than No. 18 AWG (0.82 mm²) and not less than 150 mm in length for connection of field installed wiring.	Not permanently connected equipment.	**N**
3.2.3	If supply wires exceed 60 °C, marking indicates use of 75 °C or 90 °C wiring for supply connection as appropriate.	Not permanently connected equipment.	**N**
3.2.3	Equipment compatible with suitable trade sizes of conduits and cables.	Not permanently connected equipment.	**N**
3.2.5	Length of power supply cord limited to between 1.5 and 4.5 m unless shorter length used when intended for a special installation.	Refer to Summary Of Testing in main test report.	**N**
3.2.5	Conductors in power supply cords sized per NEC	Refer to Summary Of Testing in main test report.	**N**
3.2.5	Power supply cords and cord sets incorporate flexible cords suitable for the particular application.	Refer to Summary Of Testing in main test report.	**N**
3.2.6	Strain relief provided for non-detachable interconnecting cables not supplied by a limited power source.	Power supply for building-in should be evaluated when market in U.S.A.	**N**
3.2.9	Adequate wire bending space and volume of field wiring compartment required to properly make the field connections.	The equipment is provided with an appliance inlet.	**N**
3.2.9	Equipment solely for installation in Restricted Access Locations using low voltage d.c. systems may not need provision for connecting and securing a field wiring system when wiring is protected from abuse.	Equipment not intended for installation in RAL.	**N**
3.3	Field wiring terminals provided for interconnection of units for other then LPS or Class 2 circuits also comply with 3.3.	The equipment is provided with an appliance inlet.	**N**
3.3	Interconnection of units by LPS or Class 2 conductors may have field wiring connectors other than specified in 3.3 if wiring is reliably separated	The equipment is provided with an appliance inlet.	**N**
3.3.1	Terminals for the connection of neutral conductor identified by a distinctive white marking or other equally effective means	The equipment is provided with an appliance inlet.	**N**
3.3.3	Wire binding screw terminal permitted for connection of No. 10 AWG (5.3 mm²) or smaller	The equipment is provided with an applicant inlet.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
	conductor if provided with upturned lugs, cupped washer or equivalent retention.		
3.3.4	Terminals accept US wire sizes (gauge)	No terminals provided.	**N**
3.3.4	Terminals accept current-carrying conductors rated 125% of the equipment current rating.	No terminals provided.	**N**
3.3.6	Field wiring terminals marked to indicate the material(s) of the conductor for the terminals used	The equipment is provided with an applicant inlet.	**N**
3.3.6	Aluminum conductors not permitted for connection to terminal for equipment earthing conductor	The equipment is provided with an applicant inlet.	**N**
3.3.6	Field wiring connections made through the use of suitable pressure connectors (including set screw type), solder lugs or splices to flexible leads.	The equipment is provided with an applicant inlet.	**N**
3.4.2	Separate motor control device(s) required for cord-connected equipment rated more than 12 A, or with motor rated more than 1/3 hp or more than 120 V.	No AC motors in the equipment.	**N**
3.4.8	Vertically mounted disconnect devices oriented so up position of handle is "on".	No such switch used.	**N**
3.4.11	For computer-room applications, equipment with battery systems capable of supplying 750 VA for 5 minutes provided with battery disconnect means	No battery in the equipment.	**N**
4.2.8.1	Special opening restrictions for enclosures around CRTs with face dimension of 160 mm or more.	No CRTs in the equipment.	**N**
4.2.9	Compartment housing high-pressure lamp marked to indicate risk of explosion.	No high-pressure lamp provided.	**N**
4.2.11	For equipment mounted on racks and provided with slide/rails allowing the equipment to slide away from the rack for installation and maintenance, additional construction, performance and marking requirements are applicable to determine the adequacy of the slide/rails	No mounting on racks and provided with slide/rails.	**N**
4.3.2	Loading test for equipment with handle(s) used to support more than 9 kg	No handle.	**N**
4.3.6	In addition to the IEC requirements, Direct Plug-in Equipment complies with UL 1310	Not intended to plug directly into a wall socket-outlet.	**N**
4.3.12	The max. quantity of flammable liquid stored in equipment per ANSI/NFPA 30 (Table NAE.6)	No flammable liquids within the equipment.	**N**
4.3.12	Equipment using replenishable liquids marked to indicate type of liquid to be used.	No flammable liquids within the equipment.	**N**
4.3.13.2	Equipment that produces x-radiation and does not comply with 4.3.12 under all conditions of servicing marked to indicate the presence of radiation	The equipment does not generate ionizing radiation.	**P**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.13.5	Requirements contained in the applicable national codes apply to lasers (21 CFR 1040).	No laser or LED.	**N**
4.7	Automated information storage equipment intended to contain more than 0.76 m³ of combustible media requires provision for automatic sprinklers or a gaseous agent extinguishing system.	The equipment has no combustible area greater than 0.76 m³.	**N**
4.7.3.1	Equipment for use in environmental air space other than ducts or plenums provided with metal enclosure or with non-metallic enclosure having adequate fire-resistance and low smoke producing characteristics (according to UL 2043). Equipment for installation in space used for environmental air, described in Sec. 300-22(c) of the NEC, provided with instructions indicating suitability for installation	Equipment not used in environmental air space.	**N**
4.7.3.1	Flame spread rating for external surface of combustible material with exposed area greater than 0.9 m² or a single dimension greater than 1.8 m; 50 or less for computer room applications or 200 or less for other applications.	The equipment has neither combustible area greater than 0.9 m^2 nor a single dimension greater than 1.8 m.	**N**
4.7.3.4	Wire marked "VW-1" or "FT-1" considered equivalent.	Considered.	**P**
5.1.8.2	Special earthing provisions and instructions for equipment with high touch current due to telecommunication network connections.	Not connected to a telecommunication network.	**N**
5.1.8.3	Touch current due to ringing voltage for equipment containing telecommunication network leads.	Not connected to a telecommunication network.	**N**
5.3.7	Overloading of SELV connectors and printed wiring board receptacles accessible to the operator.	Considered.	**P**
5.3.7	Tests interrupted by opening of a component repeated two additional times.	Considered.	**P**
5.3.9.1	Test interrupted by opening of wire or trace subject to certain conditions.	Not applicable	**N**
6	Specialized instructions for telephones that may be connected to a telecommunications network	No TNV circuitry.	**N**
6	Marking identifying function of telecommunication type connectors not used for connection to a telecommunication network.	No TNV circuitry.	**N**
6.3	Equipment remotely powered over telecommunication wiring systems provided with specialized markings adjacent to the connection.	No TNV circuitry.	**N**
6.3	Overcurrent protection incorporated into equipment to provide power over telecommunication wiring system not interchangeable with devices of higher ratings if operator replaceable.	No TNV circuitry.	**N**
6.4	Additional requirements for equipment connected to a telecommunication network using cable subject to overvoltage from power line failures	No TNV circuitry.	**N**
6.4	Where 26 AWG line cord required by Fig. 6C, either	No TNV circuitry.	**N**

IEC 60950-1:2005			
Clause	Requirement + Test	Result - Remark	Verdict
	the cord is provided with the equipment or described in the safety instructions.		
7	Equipment associated with the cable distribution system may need to be subjected to applicable parts of Chapter 8 of the NEC.	Not cable distribution systems.	**N**
H	Ionizing radiation measurements made under single fault conditions according to 21 CFR 1020	The equipment does not produce ionizing radiation.	**N**
M.2	Continuous ringing signals evaluated to Method A subjected to special accessibility considerations.	No applicable.	**N**
M.4	Special requirements for message waiting and similar telecommunications signals.	Not applicable.	**N**
NAC	Equipment for use with a generic secondary protector marked with suitable instructions.	Not applicable.	**N**
NAC	Equipment marked with suitable instructions if for use with a specific primary or secondary protector	Not applicable.	**N**
NAD	Acoustic pressure from an ear piece for short and long duration disturbances	Not applicable.	**N**
NAD	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	Not applicable.	**N**
NAF	Household/Home Office Document Shredders		**N**
NAF.1.7	Markings and instructions alert the user to key safety considerations related to use of shredders, including not intended to be used by children, avoid touching document feed opening, avoid clothes and hair entanglement, and avoid aerosol products.	The equipment is not a shredders.	**N**
NAF.2.8.3	Safety interlock cannot be inadvertently activated by the articulated accessibility probe		**N**
NAF.3.4	Provided with an isolating switch complying with 3.4.2, including 3 mm contact gap, with appropriate markings associated with the switch.		**N**
NAF.4.4	Hazardous moving parts are not accessible, as determined using the articulated accessibility probe and the accessibility probe/wedge		**N**

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Report No. 139234

ATTACHMENT: AUSTRALIAN / NEW ZEALAND DIFFERENCES
Test results according to CB BULLETIN No. 112A, December 2006

Clause	Requirements – Test	Result – Remark	Verdict
ZZ.1 Introduction This Annex sets out variations between this Standard and IEC 60950-1:2001. These variations indicate national variations for purposes of the IECEE CB Scheme and will be published in the IECEE CB Bulletin. These variations are indicated within the body of the Standard.			
ZZ.2 Variations The variations are as follows:			
1.2	Between the definitions for 'Person, service' and 'Range, rated frequency' *insert* the following: **POTENTIAL IGNITION SOURCE** 1.2.12.201	Considered.	**P**
1.2.12.15	After the definition 1.2.12.15, *add* the following: **1.2.12.201 POTENTIAL IGNITION SOURCE:** Possible fault which can start a fire if the open-circuit voltage measured across an interruption or faulty contact exceeds a value of 50 V (peak) a.c. or d.c. and the product of the peak value of this voltage and the measured r.m.s. current under normal operating conditions exceeds 15 VA. Such a faulty contact or interruption in an electrical connection includes those which may occur in **CONDUCTIVE PATTERNS** on **PRINTED BOARDS.** NOTE 201: An electronic protection circuit may be used to prevent such a fault from becoming a POTENTIAL IGNITION SOURCE. NOTE 202: This definition is from AS/NZS 60065:2003.	Considered.	**P**
1.5.1	*Add* the following to the end of first paragraph: 'or the relevant Australian/New Zealand Standard'.	Considered.	**P**
1.5.2	*Add* the following to the end of first and third dash items: 'or the relevant Australian/New Zealand Standard'.	Considered.	**P**
2.1	*Delete* the Note	Considered.	**P**
3.2.3	*Delete* Note 2	The equipment is not intended for permanent connection to the mains.	**N**

3.2.5.1	*Modify* Table 3B as follows: *Delete* the first four rows and replace with **RATED CURRENT OF EQUIPMENT A** / **Minimum conductor sizes** — **Nominal cross-sectional area mm²** / **AWG or kcmil [cross-sectional area in mm²] see note 2** Over 0.2 up to and including 3 — 0,5 [1)] — 18 [0,8] Over 3 up to and including 7.5 — 0,75 — 16 [1,3] Over 7.5 up to and including 10 — (0,75)[2)] — 1,00 — 16 [1,3] Over 10 up to and including 16 — (1,0)[3)] — 1,5 — 14 [2] *Replace* footnote 1) with the following: 1) 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). *Delete* Note 1.	Refer to Summary Of Testing in main test report.	**N**
4.3.6	*Replace* paragraph three with: 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.	Not intended to plug directly into a wall socket-outlet.	**N**
4.3.13.5	*Add* the following to the end of first paragraph: 'or AS/NZS 2211.1'.	No laser or LED.	**N**
4.7	*Add* the following paragraph: For alternative tests refer to Clause 4.7.201.	Refer to below.	**P**

4.7.201	*Add* the following after Clause 4.7.3.6: **4.7.201 Resistance to fire – Alternative tests** **4.7.201.1 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 originating from inside the apparatus, or the following: a) Components that are contained in an enclosure having a flammability category of FV-0 according to AS/NZS 4695.707 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 1750mm^3, integrated circuits, transistors and optocoupler packages, if these components are mounted on material of flammability category FV-1, or better, according to AS/NZS 4695.707. 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 fire from one part to another. Compliance shall be checked by the tests of 4.7.201.2, 4.7.201.3, 4.7.201.4 and 4.7.201.5. For the base material of printed boards, compliance shall be checked by the test of 4.7.201.5. The tests shall be carried out on parts of non-metallic material which have been removed from the apparatus. 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. **4.7.201.2 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.	All materials have suitable flame class, no testing required.	**P**

<table>
<tr>
<td>4.7.201</td>
<td>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 not be carried out on parts of material classified at least FH-3 according to ISO 9772 provided that the sample tested was not thicker than the relevant part.

4.7.201.3 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 also be 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.

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 shall not be tested.

The needle-flame test shall be made in accordance with AS/NZS 4695.2.2 with the following modifications:

<table>
<tr><th>Clause of AS/NZS 4695.2.2</th><th>Change</th></tr>
<tr><td>5 Severities</td><td>Replace with:

The duration of application of the test flame shall be 30 s ±1 s.</td></tr>
<tr><td>8 Test procedure

8.2

8.4

8.5</td><td>

Replace the first sentence with:

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.

The first paragraph does not apply.

Addition:

If possible, the flame shall be applied at least 10 mm from a corner.

Replace with:

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 then withstand the test.</td></tr>
<tr><td>10 Evaluation of test results</td><td>Replace with:

The duration of burning (t_b) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15 s.</td></tr>
</table>
</td>
<td>All materials have suitable flame class, no testing required.</td>
<td>P</td>
</tr>
</table>

4.7.201	The needle-flame test shall not be carried out on parts of material classified as V-0 or V-1 according to IEC 60695-11-10, provided that the sample tested was not thicker than the relevant part. **4.7.201.4 Testing in the event of non-extinguishing material** If the parts, other than enclosures, do not withstand the glow-wire tests of 4.7.201.3, by failure to extinguish within 30 s after the removal of the glow-wire tip, the needle-flame test detailed in 4.7.201.3 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 tests of 4.7.201.3. 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 4.7.201 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 4.7.201 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.	All materials have suitable flame class, no testing required.	**P**

4.7.201	**4.7.201.5 Testing of printed boards** The base material of printed boards shall be subjected to the needle-flame test of Clause 4.7.201.3. 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**; - 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 FV-1 or better according to AS/NZS 4695.707, or the printed boards are protected by an enclosure meeting the flammability category FV-0 according to AS/NZS 4695.707, or made of metal, having openings only for connecting wires which fill the openings completely; or - Base material of printed boards, on which the available apparent 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 FV-0 according to AS/NZS 4695.707 or the printed boards are contained in a metal enclosure, having openings only for connecting wires which fill the openings completely. Compliance 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 maximise the apparent power from more than 2 min when the circuit supplied is disconnected.	All materials have suitable flame class, no testing required.	**P**
6.2.2	*Add* the symbol [NZ] in the right hand margin beside the first paragraph. *Add* the following after the first paragraph: In Australia (this variation does not apply in New Zealand), compliance with 6.2.2 shall be checked by the tests of both 6.2.2.1 and 6.2.2.2. *Delete* the Note.	No TNV circuits in the equipment.	**N**

6.2.2.1	*Add* the symbol [NZ] in the right hand margin beside the first paragraph including Note 1. *Delete* the Note 2. *Add* the following after the first paragraph: In Australia (this variation does not apply in New Zealand), the electrical separation is subjected to 10 impulses of alternating polarity, using the impulse test generator of annex N for 10/700µs impulses. The interval between successive impulses is 60 s and the initial voltage, Uc, is: - for 6.2.1 a): 7.0 kV for hand-held telephones and for headsets and 2.5 kV for other equipment; and - for 6.2.1 b) and 6.2.1 c): 1.5 kV. NOTE 201: The 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines. NOTE 202: The 2.5 kV for 6.2.1 a) was chosen to ensure adequacy of the insulation concerned and does not necessarily simulate likely overvoltages.	No TNV circuits in the equipment.	**N**
6.2.2.2	*Add* the symbol [NZ] in the right hand margin beside the second paragraph. *Delete* the Note. *Add* the following after the second paragraph: In Australia (this variation does not apply in New Zealand), the a.c. test voltage is: - for 6.2.1 a): 3 kV; and - for 6.2.1 b) and 6.2.1 c): 1.5 kV. NOTE 201: 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 have been determined considering the low frequency induced voltages from the power supply distribution system.	No TNV circuits in the equipment.	**N**
Annex P	*Add* the following Normative References to Annex P: IEC 60065, *Audio, Video and similar electronic apparatus – Safety requirements.* AS/NZS 3191, *Approval and test specification – Electric flexible cords.* AS/NZS 3112, *Approval and test specification – Plugs and socket-outlets.* AS/NZS 4695.707, *Fire hazard testing of electrotechnical products – Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source.*	Considered.	**P**

Index	Between the entries ‘polyimide insulating material’ and ‘powder’ *insert* the following: POTENTIAL IGNITION SOURCE **1.12.201**, 4.7.201.3, 4.7.201.5	Considered.	**P**

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Report No. 139234

ATTACHMENT: SINGAPORE DIFFERENCES to IEC 60950-1 (ed.1)

No	Item	Requirement	Result - Remark	Verdict
The following is the national differences in accordance with safety authority website www.safety.org.sg/ , ref. Singapore Consumer Protection (Safety Requirements) - Information booklet - chapter 7 (page 23 - 26). Based on information by Singapore NCB – PSB Corp.				
7 SAFETY AUTHORITY'S REQUIREMENTS The Safety Authority monitors the safety of the controlled goods sold in Singapore by investigating all complaints, incidents and accidents reported to the authority. Experiences gained are translated into the Safety Authority's Requirements. These requirements are to be fulfilled in addition to the applicable safety standards.				
Applicable to all electrical products				
2	All appliances	All appliances must be tested to 230 VAC.	Tested within the range 100-240V	**P**
3	Voltage selector (voltage mis-match test)	Appliance fitted with voltage selector shall be tested as follows: Connect appliance to 230 VAC mains with voltage selector switch to settings not suitable for operation at 230 VAC.	No such component.	**N**
4	Tropical condition test	All appliances (with tropical test requirements in applicable Standards) shall comply with the tropical condition test as stated in the relevant IEC Standards.	Test performed, see main test report.	**P**
5	Class I appliances (3-pin mains plug)	All Class I appliances must be fitted with 3-pin mains plugs complied with SS 145/SS 472 that are registered with the Safety Authority.	Refer to Summary Of Testing in main test report.	**N**
6	Class II appliances (mains plug)	a) All Class II appliances must be fitted with 2-pin mains plug (Appendix W) complied with IEC 83: 1975 (Standard C5, Version II) or EN 50075: 1991. b) Class II appliances that are fitted with 3-pin mains plugs must use plugs that are complied with SS 145 and registered with the Safety Authority.	Class I equipment.	**N**
7	Appliances rated ≥ 3 kW or connected to fixed wiring	Electric appliance ≥ 3 kW must be connected to fixed wiring. All connection to fixed wiring must be in accordance with Code of Practice CP5.	Rating is <3kW	**N**

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No	Item	Requirement	Result - Remark	Verdict
8	Detachable power cord set (consists of mains plug, mains cord and appliance connector)	Detachable power cord set must be listed in the test report critical component list.	Refer to Summary Of Testing in main test report.	N
9	Circuit diagrams	Circuit diagrams must be indicated with component's values for products tested to IEC 60065 and IEC 60950.	Must be considered when marketing in Singapore.	—
10	Circuit diagrams of electronic modules in electrical appliances	Circuit diagrams of the electronic modules in the electrical appliances must be provided.	Must be considered when marketing in Singapore.	—
11	Controlled goods likely to be treated as toy by children	Controlled goods, having an enclosure, which is shaped and decorated so that it is likely to be treated as a toy by children, shall not be accepted for certification and registration.	The shape and function are not considered as toy.	N
		Applicable to AC adaptor		
13	3-pin AC adaptor	Test report showing that the 3-pin complied with sub-clauses 12.1 & 12.3 of SS 246 must be submitted.	This is Switching Power Supply for building-in.	N
14	2-pin AC adaptor	The 2-pin (Appendix W) shall comply with IEC 83: 1975 (Standard C5, Version II) or EN 50075.	This is Switching Power Supply for building-in.	N
15	Detachable power supply cord set not supplied by Registered Supplier	Registered Supplier who is not supplying the detachable power supply cord set together with the AC Adaptor must provide written instruction to its customer on the type of approved detachable power cord set to use.	This is Switching Power Supply for building-in.	N
		Applicable to computer products		
16	CD/DVD ROM (used in personal computer)	Test certificate showing that CD/DVD ROM has complied with IEC 825 must be provided.	Not used.	N
17	Modem Card (used in personal computer)	Modem card incorporated in the personal computer must be tested at set level (sub-clauses 5.1 & 6 of IEC 60950) or at component level.	Not used.	N

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Applicable to plasma/LCD display monitor				
35	Plasma/LCD display monitor with TV tuner	Plasma/LCD display monitor tested to IEC 60950 would require additional test to clauses 9 (related to antenna only), 10.1, 10.2, 10.3 and 12.5 of IEC 60065.	No TV tuner provided.	**N**