IEC IECEE CB SCHEME

Ref. Certif. No.

DE 3 - 53884M3

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

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC

Product Produit	Power supply (Switching Power Supply)
Name and address of the applicant Nom et adresse du demandeur	Solytech Enterprise Corporation 3F, 18, Wu Chun 7 Rd., Wu Gu Ind. Area 248 Wu Gu Shiang, Taipei,, TAIWAN
Name and address of the manufacturer Nom et adresse du fabricant	Solytech Enterprise Corporation, 3F, 18, Wu Chun 7 Rd., Wu Gu Ind. Area, 248 Wu Gu Shiang, Taipei,, TAIWAN
Name and address of the factory Nom et adresse de l'usine	Qxan Xiang Electronic Co.,Ltd., FuGang Ind.Section Qingxi Town, 523660 Dong Guan City, Guang Dong, PEOPLE'S REPUBLIC OF CHINA For further information please see attachment
Rating and principal characteristics Valeurs nominales et caractéristiques principales	Rated input voltage: 100-240 Vac or 230 Vac Rated input current: See Appendix Rated frequency: 60/50 Hz or 50 Hz Rated outputs: See Appendix Protection class: I
Trade mark (if any) Marque de fabrique (si elle existe)	SOLY
Model/type Ref. Ref. de type	SL-XXXXEPS, MS-4600 ("XXXX" can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550, 8600 or 8700 to denote different output rating)
Additional information (if necessary) Information complémentaire (si nécessaire)	
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60950-1:2001
as shown in the Test Report Ref. No. which form part of this certificate comme indiqué dans le Rapport d'essais numéro de référence qui constitue une partie de ce certificat	TÜV SÜD Product Service 081-51032-300

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

Date, 2007-05-29
CB 07 05 50034 052

Ralph Fischer

TÜV SÜD Product Service GmbH · Certification Body · Ridlerstrasse 65 · D-80339 München

TÜV SÜD Product Service

CB-1 03.06

Appendix to CB Certificate

The factories are as below:

1) Deer Electronics (Donggun) Co., Ltd. (Factory ID No.: 50076)
ChangShan Tou, Management Area, Qing Xi, Dongguan, Guangdong, People's Republic of China

2) Qxan Xiang Electronic Co.,Ltd. (Factory ID No.: 52537)
FuGang Ind.Section Qingxi Town, 523660 Dong Guan City, Guang Dong, People's Republic of China

Brief description of the test sample:

- This equipment is Switching Power Supply (built-in type) for use in information technology equipment.

TÜV SÜD Product Service

Appendix to CB Certificate

The input and outputs of the models are as below:

Model-#	Input Ratings (AC)	Output Ratings (DC)						Max. Watt.
		+3.3V	+5V	+12V1	+12V2	-12V	+5VSB	
SL-8220EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	10 A	8 A	6 A	9 A	0.5 A	2.5 A	200 W
		(+5V and +3.3V total power max. 70 W)						
		(+5V, +12V and +3.3V total power max. 185 W)						
SL-8240EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	12 A	10 A	6 A	10 A	0.5 A	2.5 A	235 W
		(+5V and +3.3V total power max. 80 W)						
		(+5V, +12V and +3.3V total power max. 220 W)						
SL-8270EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	16 A	13 A	8 A	13 A	0.5 A	2.5 A	250 W
		(+5V and +3.3V total power max. 115 W)						
		(+5V, +12V and +3.3V total power max. 235 W)						
SL-8320EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	18 A	14 A	8 A	13 A	0.5 A	2.5 A	300 W
		(+5V and +3.3V total power max. 120 W)						
		(+5V, +12V and +3.3V total power max. 285 W)						
SL-8360EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	20 A	16 A	10 A	13 A	0.5 A	2.5 A	350 W
		(+5V and +3.3V total power max. 130 W)						
		(+5V, +12V and +3.3V total power max. 335 W)						
SL-8400EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	20 A	18 A	14 A	13 A	0.5 A	2.5 A	400 W
		(+5V and +3.3V total power max. 130 W)						
		(+5V, +12V and +3.3V total power max. 385 W)						
SL-8460EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A	20 A	18 A	15 A	0.5 A	2.5 A	460 W
		(+5V and +3.3V total power max. 130 W)						
		(+5V, +12V and +3.3V total power max. 445 W)						
SL-8500EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A	22 A	18 A	18 A	0.5 A	2.5 A	500 W
		(+5V and +3.3V total power max. 130 W)						
		(+5V, +12V and +3.3V total power max. 485 W)						
SL-8550EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A	24 A	20 A	18 A	0.5 A	2.5 A	550 W
		(+5V and +3.3V total power max. 140 W)						
		(+5V, +12V and +3.3V total power max. 535 W)						
SL-8600EPS, SL-8700EPS, MS-4600	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A	30 A	22 A	22 A	0.5 A	2.5 A	600 W
		(+5V and +3.3V total power max. 150 W)						
		(+5V, +12V and +3.3V total power max. 585 W)						

Date, 2007-05-29 Signature: Ralph Fischer

TÜV SÜD Product Service

CB-2 03.06

Product Service

TEST REPORT

IEC 60950-1 First Edition

Information technology equipment – Safety –

Part 1: General requirements

Report reference No ..... :	081-51032-300
Date of issue..... :	2007-05-25
Appendix to test report, Ref.No. ..... :	081-51032-200
Modification on the Appliance ..... :	See page 7
Modification to Clause ..... :	See page 7
Pages concerned ..... :	1, 2, 4, 8
Tested by (printed name and signature) ..... :	Josef Wörl
Approved by (printed name and signature) ..... :	Manfred Schmolke

Testing Laboratory Name ..... :	TÜV SÜD Product Service GmbH
Address ..... :	Ridlerstr. 65, D-80339 München
Testing location ..... :	CBTL
Address ..... :	Ridlerstr. 65, D-80339 München

Applicant's Name ..... :	Solytech Enterprise Corporation
Address ..... :	3F, 18, Wu Chun 7 Rd., Wu Gu Ind. Area,
	248 Wu Gu Shiang, Taipei, Taiwan.

Test specification

Standard ..... :	IEC 60950-1:2001, First Edition
Test procedure ..... :	CB –Scheme
Non-standard test method ..... :	N

Test Report Form No..... :	SL-XXXXEPS-M3.DOC
TRF originator..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2001-12

Test item description ..... :	Switching Power Supply
Trademark ..... :	**SOLY**
Model and/or type reference ..... :	SL-XXXXEPS, MS-4600 (“XXXX” can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550, 8600 or **8700**)
Manufacturer ..... :	Same as applicant.
Factory (ies) ……..:	See next page
Rating(s) ..... :	See pages 5 for details.

Particulars: test item vs. test requirements

Equipment mobility ..... :	Build-in
Operating condition ..... :	Continuous
Mains supply tolerance (%)..... :	+10%, -10%
Tested for IT power systems ..... :	N
IT testing, phase-phase voltage(V) :	N
Class of equipment ..... :	Class I
Mass of equipment (kg)..... :	Approx. 1.91
Protection against ingress of water ... :	Ordinary

Possible test case verdicts:

- test case does not apply to the test object ..... :	N(.A.)
- test object does meet the requirement ..... :	P(ass)
- test object does not meet the requirement ..... :	F(ail)

Attachments:

Original Test Report No. 081-51032-000	70	pages
Attachment Test Report No. 081-51032-100	12	pages
Attachment Test Report No. 081-51032-200	44	pages

Testing

Date of receipt of test item ..... :	N/A
Date(s) of performance of test ..... :	N/A

General remarks:

”This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IECEE 02”.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item(s) tested.

”(see remark #)" refers to a remark appended to the report.

"(see Annex #)" refers to an annex appended to the report.

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

Factory (ies) :

1) Deer Electronics (Dongguan) Co., Ltd. (Factory ID No.: 50076)
ChangShan Tou, Management Area, Qing Xi, Dongguan, Guangdong, People's Republic of China

2) Qxan Xiang Electronic Co.,Ltd. (Factory ID No.: 52537)
FuGang Ind.Section Qingxi Town, 523660 Dong Guan City, Guang Dong, People's Republic of China

General descriptions:

This equipment is Switching Power Supply (built-in type) for use in information technology equipment.

The model SL-XXXXEPS, where “XXXX” can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550, 8600 or **8700** to denote different output rating.

All models of series are similar to model SL-8600EPS except for output rating and model designation.

The models SL-8600EPS and SL-8700EPS are identical to model MS-4600 except for model name.

The input and outputs of the models are as below:

Model-#	Input Ratings (AC)	Output Ratings (DC)	Max. Watt.
		+3.3V +5V +12V1 +12V2 -12V +5VSB	
SL-8220EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	10 A 8 A 6 A 9 A 0.5 A 2.5 A (+5V and +3.3V total power max. 70 W) (+5V, +12V and +3.3V total power max. 185 W)	200 W
SL-8240EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	12 A 10 A 6 A 10 A 0.5 A 2.5 A (+5V and +3.3V total power max. 80 W) (+5V, +12V and +3.3V total power max. 220 W)	235 W
SL-8270EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	16 A 13 A 8 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 115 W) (+5V, +12V and +3.3V total power max. 235 W)	250 W
SL-8320EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	18 A 14 A 8 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 120 W) (+5V, +12V and +3.3V total power max. 285 W)	300 W
SL-8360EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	20 A 16 A 10 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 335 W)	350 W
SL-8400EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	20 A 18 A 14 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 385 W)	400 W
SL-8460EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 20 A 18 A 15 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 445 W)	460 W
SL-8500EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 22 A 18 A 18 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 485 W)	500 W
SL-8550EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 24 A 20 A 18 A 0.5 A 2.5 A (+5V and +3.3V total power max. 140 W) (+5V, +12V and +3.3V total power max. 535 W)	550 W
SL-8600EPS, SL-8700EPS, MS-4600	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 30 A 22 A 22 A 0.5 A 2.5 A (+5V and +3.3V total power max. 150 W) (+5V, +12V and +3.3V total power max. 585 W)	600 W

Unless otherwise specified, all tests were performed on model MS-4600 to represent the other similar models.

Copy of marking plate:

Report No. <081-51032-300>

The construction of the switching power supply models SL-XXXXEPS and MS-4600 were modified as follows:

1. Add new model “SL-8700EPS” for trademark “**SOLY**”.

For the above described modification the following Clause/Testing was considered to be necessary:

Modification	Clause/Testing	Remark/Comments	Verdict
1.	Clause 1.7	Marking and instructions	P

Cl.	Requirement - Test	Result - Remark	Verdict

1.7	Marking and instructions		P
1.7.1	Power rating	See below.	P
	Manufacturer's name or trademark or identification mark .....:	**SOLY**	P
	Type/model or type reference .....:	SL-XXXXEPS ("XXXX" can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550, 8600 or **8700**), MS-4600	P

Product Service

TEST REPORT

IEC 60950-1 First Edition

Information technology equipment – Safety –

Part 1: General requirements

Report reference No ..... :	081-51032-200
Date of issue..... :	2007-04-23
Appendix to test report, Ref.No. ..... :	081-51032-100
Modification on the Appliance ..... :	See page 7
Modification to Clause..... :	See pages 7 and 8
Pages concerned ..... :	1, 2, 4, 5, 6, 8, 9, 19, 20, 38, 39, 40, 41, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 63, 64, 65, 66, 68, 69, 70
Tested by (printed name and signature) ..... :	Josef Wörl .....
Approved by (printed name and signature) ..... :	Ralph Fischer .....
Testing Laboratory Name ..... :	TÜV SÜD Product Service GmbH
Address ..... :	Ridlerstr. 65, D-80339 München
Testing location ..... :	CBTL
Address ..... :	Ridlerstr. 65, D-80339 München
Applicant's Name ..... :	Solytech Enterprise Corporation
Address ..... :	3F, 18, Wu Chun 7 Rd., Wu Gu Ind. Area, 248 Wu Gu Shiang, Taipei, Taiwan.
Test specification	
Standard ..... :	IEC 60950-1:2001, First Edition
Test procedure ..... :	CB –Scheme
Non-standard test method ..... :	N
Test Report Form No..... :	SL-XXXXEPS-M2.DOC
TRF originator..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2001-12

Test item description ..... :	Switching Power Supply
Trademark ..... :	**SOLY**
Model and/or type reference ..... :	SL-XXXXEPS, MS-4600 (“XXXX” can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550 or 8600)
Manufacturer ..... :	Same as applicant.
Factory (ies) ……..:	See next page
Rating(s) ..... :	See pages 5 for details.

Particulars: test item vs. test requirements

Equipment mobility ..... :	Build-in
Operating condition ..... :	Continuous
Mains supply tolerance (%)..... :	+10%, -10%
Tested for IT power systems ..... :	N
IT testing, phase-phase voltage(V) :	N
Class of equipment ..... :	Class I
Mass of equipment (kg)..... :	Approx. 1.91
Protection against ingress of water ... :	Ordinary

Possible test case verdicts:

- test case does not apply to the test object ..... :	N(.A.)
- test object does meet the requirement ..... :	P(ass)
- test object does not meet the requirement ..... :	F(ail)

Attachments:

Original Test Report No. 081-51032-000	70	pages
Attachment Test Report No. 081-51032-100	12	pages

Testing

Date of receipt of test item ..... :	2007-03-23
Date(s) of performance of test ..... :	2007-03-26 to 2007-03-30

General remarks:

”This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IECEE 02”.

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The test results presented in this report relate only to the item(s) tested.

”(see remark #)" refers to a remark appended to the report.

"(see Annex #)" refers to an annex appended to the report.

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

Factory (ies) :

1) Deer Electronics (Dongguan) Co., Ltd. (Factory ID No.: 50076)
ChangShan Tou, Management Area, Qing Xi, Dongguan, Guangdong, People's Republic of China

2) Qxan Xiang Electronic Co.,Ltd. (Factory ID No.: 52537)
FuGang Ind.Section Qingxi Town, 523660 Dong Guan City, Guang Dong, People's Republic of China

General descriptions:

This equipment is Switching Power Supply (built-in type) for use in information technology equipment.

The model SL-XXXXEPS, where “XXXX” can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550 or 8600 to denote different output rating.

All models of series are similar to model SL-8600EPS except for output rating and model designation.

The model SL-8600EPS is identical to model MS-4600 except for model name.

The input and outputs of the models are as below:

Model-#	Input Ratings (AC)	Output Ratings (DC)	Max. Watt.
		+3.3V +5V +12V1 +12V2 -12V +5VSB	
SL-8220EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	10 A 8 A 6 A 9 A 0.5 A 2.5 A (+5V and +3.3V total power max. 70 W) (+5V, +12V and +3.3V total power max. 185 W)	200 W
SL-8240EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	12 A 10 A 6 A 10 A 0.5 A 2.5 A (+5V and +3.3V total power max. 80 W) (+5V, +12V and +3.3V total power max. 220 W)	235 W
SL-8270EPS	100-240Vac, 60/50Hz, 6/4A or 230Vac, 50Hz, 4A	16 A 13 A 8 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 115 W) (+5V, +12V and +3.3V total power max. 235 W)	250 W
SL-8320EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	18 A 14 A 8 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 120 W) (+5V, +12V and +3.3V total power max. 285 W)	300 W
SL-8360EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	20 A 16 A 10 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 335 W)	350 W
SL-8400EPS	100-240Vac, 60/50Hz, 8/4A or 230Vac, 50Hz, 4A	20 A 18 A 14 A 13 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 385 W)	400 W
SL-8460EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 20 A 18 A 15 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 445 W)	460 W
SL-8500EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 22 A 18 A 18 A 0.5 A 2.5 A (+5V and +3.3V total power max. 130 W) (+5V, +12V and +3.3V total power max. 485 W)	500 W
SL-8550EPS	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 24 A 20 A 18 A 0.5 A 2.5 A (+5V and +3.3V total power max. 140 W) (+5V, +12V and +3.3V total power max. 535 W)	550 W
SL-8600EPS MS-4600	100-240Vac, 60/50Hz, 10/6A or 230Vac, 50Hz, 6A	24 A 30 A 22 A 22 A 0.5 A 2.5 A (+5V and +3.3V total power max. 150 W) (+5V, +12V and +3.3V total power max. 585 W)	600 W

Unless otherwise specified, all tests were performed on model MS-4600 to represent the other similar models.

Copy of marking plate:

Report No. <081-51032-200>

The construction of the switching power supply models SL-XXXXEPS and MS-4600 were modified as follows:

1. Add two enclosure cases for all models used, see photos for details.
2. Add the component of DC Fan for new cases used, see table 1.5.1 for details.
3. Change the input rating, see pages 5 for details.
4. Modify location of components including Resistor (from “CR1” to “RA1”), X Capacitor (from “CCX1” to “CXA1”), Fuse (from “F1” to “FA1”), Choke (from “L1” to “LF1”), Choke (from “F2” to “T4”), Photo Coupler (from “PH1, PH2, PH3” to “U8, U9, U10”) and Transistor (from “Q5” to “U7”), see table 1.5.1 for details.
5. Modify technical data of components including Resistor (RA1), Ripple Capacitor (C2) and Mylar sheet, see table 1.5.1 for details.
6. Delete the components including Choke (CL1), Resistor (R80, R91) and X Capacitor (CX2), see table 1.5.1 for details.
7. Add an alternate component for Choke (CLF1), see table 1.5.1 for details.
8. Modify components source including Choke (T4) and Transformer (T1).
9. Modify component for Resistor (RT1) from compulsory to optional, see table 1.5.1 for details.
10. Change the shape of heatsink, see photos for details.
11. Change Fuse location from main board to EMI board, see photos for details.
12. Modify the PCB layout, see photos for details.
13. Revised the type error correction, see Clause 2.10.4 for detail.

For the above described modification the following Clause/Testing was considered to be necessary:

Modification	Clause/Testing	Remark/Comments	Verdict
1.	Clause 1.5.5	Interconnecting cables	P
2.	Clause 1.7	Marking and instructions	P
3.	Clause 2.10	Clearances, creepage distances and distances through insulation	P
4.	Clause 4.2.4	Steady force test, 250 N	P
5.	Annex C.2	Safety isolation transformer	P
6.	Annex U	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION	P
7.	Table 1.5.1	List of critical components	P
8.	Table 1.6.2	Electrical data (in normal conditions)	P
9.	Table 2.1.1.5	Energy hazard	P

Report No. <081-51032-200>

For the above described modification the following Clause/Testing was considered to be necessary:

Modification	Clause/Testing	Remark/Comments	Verdict
10.	Table 2.1.1.7	Discharge test	P
11.	Table 2.2.2	Hazardous voltage (circuit) Measurement Test	P
12.	Table 2.2.2; 2.2.3; 2.2.4	SELV Reliability Test	P
13.	Table 2.10.2	Max. working voltage measurement	P
14.	Table 2.10.3; 2.10.4	Clearance and creepage distance measurements	P
15.	Table 4.5	Maximum temperatures	P
16	Table 5.1	Touch current measurement	P
17	Table 5.2	Electric strength measurements	P
18	Table 5.3	Fault condition tests	P

Cl.	Requirement - Test	Result - Remark	Verdict
1.5	Components		P
1.5.5	Interconnecting cables	Interconnection o/p cable to other device is carrying only SELV voltages on energy level below 240VA **except +12V1 and +12V2 on the energy level over 240VA.** →Except for the insulation material, there is no further requirements to the o/p interconnection cable.	P
1.7	Marking and instructions		P
1.7.1	Power rating	See below.	P
	Rated voltage(s) or voltage range(s) (V) .....:	**See pages 5 for details.**	P
	Symbol for nature of supply, for d.c. only.....:	Mains from AC source	N
	Rated frequency or rated frequency range (Hz) :	**See pages 5 for details.**	P
	Rated current (mA or A) .....:	**See pages 5 for details.**	P
1.7.6	Fuse identification .....:	Fuse marking printed adjacent to the fuse holder reads as **FA1 T10A/250V**	P
2.10	Clearances, creepage distances and distances through insulation		P
2.10.4	Creepage distances	(see appended table 2.10.3 and 2.10.4)	P
	CTI tests :	**CTI rating for all materials of min. 100.**	—
2.10.5.4	Wound components	**The secondary winding of T1 used the triple insulation magnet wire:** **Fukukawa, type TEX-E, class E (120°C)** **(see Annex U, appended table 1.5.1)**	**P**

Cl.	Requirement - Test	Result - Remark	Verdict
4.2	Mechanical strength		P
4.2.4	Steady force test, 250 N	250 forces applied to metal chassis near the fixing frame of DC Fan which side might be outer enclosure. **The test was done with all enclosure cases. No safety relevant damages.**	P

Cl.	Requirement - Test	Result - Remark	Verdict

C.2	Safety isolation transformer	P
	Construction details:	
Transformer T1		
Mfr.: Lively, YONG HONG, FRIENDSHIP and YONG CHENG		
Type: ERL-39-600(80 PLUS)		
Recurring peak voltage	500V	
Required clearance insulation (from table 2H and 2J, pollution degree 2)		
for Reinforced	4.0mm + 0.4mm	
for Basic	2.0mm + 0.2mm	
Effective voltage rms	240V	
Required creepage insulation (from table 2L, pollution degree 2, material group IIIa+IIIb)		
for Reinforced	5.0mm	
for Basic	2.5mm	
Measured min. clearances		
prim-sec (Reinforced)	6.0mm	
pri-core (Basic)	3.0mm	
sec-core (Basic)	3.0mm	
Measured min. creepages		
prim-sec (Reinforced)	6.0mm	
pri-core (Basic)	3.0mm	
sec-core (Basic)	3.0mm	

Cl.	Requirement - Test	Result - Remark	Verdict

Construction:	
Concentric windings on ERL-39 type core, Three layers insulation tape between primary enamelled copper wire and secondary triple winding. Tubing on winding prevents touch within an angle of 45° to 90°. Winding ends additionally fixed with tape, outer winding is primary. Details of triple insulated wire used, see appended table 1.5.1. Metal shielding for S1 and S2 are kept at least reinforced insulation to secondary windings.	
Pin numbers	
Prim.	1-C-7; 5-S1, S2
Sec.	A-10; 8, 9-11, 12; 13, 14-B
Bobbin	
Material	CHANG CHUN, PHENOLIC, type T373J and T375J
Thickness	Min. 0.71mm
Electric strength test	
With AC 3000V after humidity treatment	
Result	Pass

Cl.	Requirement - Test	Result - Remark	Verdict

C.2	Safety isolation transformer	P
	Construction details:	
Transformer T3		
Mfr.: Lively Electronics Factory Co., Ltd.		
Type: EEL-19-600EPS		
Recurring peak voltage	560V	
Required clearance insulation (from table 2H and 2J, pollution degree 2)		
for Reinforced	4.0 + 0.4mm	
for Basic	2.0 + 0.2mm	
Effective voltage rms	350V	
Required creepage insulation (from table 2L, pollution degree 2, material group IIIa+IIIb)		
for Reinforced	7.2mm	
for Basic	3.6mm	
Measured min. clearances		
prim-sec (Reinforced)	≥7.2mm	
pri-core (Basic)	≥3.6mm	
sec-core (Basic)	≥3.6mm	
Measured min. creepages		
prim-sec (Reinforced)	≥7.2mm	
pri-core (Basic)	≥3.6mm	
sec-core (Basic)	≥3.6mm	

Cl.	Requirement - Test	Result - Remark	Verdict

Construction:	
Concentric windings on EEL-19 core, three layers insulation between primary and secondary winding. The distance tape is 3.6mm top side and 6.0mm bottom side of transformer. Tubing on end of winding (primary and secondary) to outer pin is above and more than each distance tape of and bottom side. Winding ends additionally fixed with tape, outer winding is primary.	
Pin numbers	
Prim.	7-10, 5-6
Sec.	3-4
Bobbin	
Material	SUMITOMO, PHENOLICS, type PM-9820
Thickness	Min. 0.71mm
Electric strength test	
With AC 3000V after humidity treatment	
Result	Pass

U	Annex U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		P
		Approved triple isolated wire used.	P

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
Add Components:					
DC Fan(14cm) (for enclosure shape B)	GLOBEFAN	RL4B B1402512MB	12Vdc, 0.35A, 82.84CFM	EN 60950-1	TUV
	DYNAEON	DF121425BH	12Vdc, 0.4A, 99.96CFM	EN 60950-1	TUV
DC Fan(12cm) (for enclosure shape C)	DYNAEON	DF121225BM	12Vdc, 0.4A, 88.8CFM	EN 60950-1	TUV
	KAIMEI	LF1225B1HR40 AR	12Vdc, 0.39A, 81.65CFM	EN 60950-1	TUV
Alternate Components:					
For EMI Board (optional)					
- Choke (CLF1) (optional)	FRIENDSHIP	T22*14*8	130°C	--	--
Modify Components:					
DC Fan on side **(for enclosure shape A)**	GLOBEFAN	RL48S0802512 H	12Vdc, 0.31A, 43.78CFM	EN 60950-1	TUV
DC Fan on top **(for enclosure shape A)**	GLOBEFAN	RL48S0802512 H	12Vdc, 0.31A, 43.78CFM	EN 60950-1	TUV
For EMI Board (optional)					
- X-Capacitor **(CXA1)** (optional)	Carli	MPX	Max. 1.0μF, 275Vac, 100°C	IEC 60384-14/1993	VDE
- Bleeder Resistor **(RA1)** (Optional)	PILKOR	MSR37	**1M ohm**, 1/2W minimum	EN 60065	VDE
- Fuse **(FA1)**	WALTER	TMD	T10A, 250Vac	EN 60127-2	VDE
For Main Board					
- Optical Isolator **(U8, U9, U10)**	COSMO	KPC817 KP1010	Distance through insulation =0.5mm, internal =5.3mm, External =8.0mm	VDE 0884 IEC 60950	VDE

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
- Choke **(LF1)** (optional)	LIVELY	T25*15*12	130°C	--	--
- Transistor **(U7)**	--	--	650V, 2A min.	--	--
- Ripple Cap. (C2)	--	--	330μF, **450V**,105 °C	--	--
- Choke **(T4)**	**LIVELY**	**ERL-39 APFC**	**130°C**	**--**	**--**
	YONG HONG	**ERL-39 APFC**	**130°C**	**--**	**--**
	FRIENDSHIP	**ERL-39 APFC**	**130°C**	**--**	**--**
	YONG CHENG	**ERL-39 APFC**	**130°C**	**--**	**--**
	LIVELY	**HKH-130x2PCS**	**130°C**	**--**	**--**
	YONG HONG	**HKH-130x2PCS**	**130°C**	**--**	**--**
	FRIENDSHIP	**HKH-130x2PCS**	**130°C**	**--**	**--**
	YONG CHENG	**HKH-130x2PCS**	**130°C**	**--**	**--**
- Thermistor (RT1) **(optional)**	--	--	12A, 5Ω at 25 °C		
- Transformer (T1)	**LIVELY**	**ERL-39-600(80 PLUS)**	**Class A**	**--**	**--**
	YONG HONG	**ERL-39-600(80 PLUS)**	**Class A**	**--**	**--**
	FRIENDSHIP	**ERL-39-600(80 PLUS)**	**Class A**	**--**	**--**
	YONG CHENG	**ERL-39-600(80 PLUS)**	**Class A**	**--**	**--**
- Triple wire used in T1	**Fukukawa**	**TEX-E**	**Class E**	**EN 60950-1**	**VDE**
- Insulation Sheet (for PWB and Metal Chassis)	Various	Various	V-2 or better, **min. 0.2mm thickness.**	**UL 94**	**UL**
- Insulation Sheet (Primary and Secondary components)	Various	Various	V-2 or better, **min. 0.4mm thickness.**	**UL 94**	**UL**

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
Delete Components:					
For EMI Board (optional)					
- Choke (CL1) (optional)	LIVELY	T130-127	130°C	--	--
For Main Board					
- Bleeder Resistor (R80, R91) (optional)	--	--	510KΩ, 1/4W min.	--	--
- X-Capacitor (CX2) (optional)	Carli	MPX	Max. 0.33μF, 275Vac, 100°C	IEC 60384-14/1993	VDE
[1]) an asterisk indicates a mark which assures the agreed level of surveillance					

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
For model SL-8600EPS (for T4, type ERL-39APFC used, Input rating: AC 100-240V)						
FA1	--	90V/50Hz	802	8.97	8.97	Condition A, Maximum Normal load
FA1	--	90V/60Hz	801	8.99	8.99	Ditto.
FA1	10	100V/50Hz	797	7.97	7.97	Ditto.
FA1	10	100V/60Hz	795	7.99	7.99	Ditto.
FA1	6	240V/50Hz	760	3.25	3.25	Ditto.
FA1	6	240V/60Hz	760	3.25	3.25	Ditto.
FA1	--	264V/50Hz	759	2.97	2.97	Ditto.
FA1	--	264V/60Hz	758	2.97	2.97	Ditto.
FA1	--	90V/50Hz	781	8.82	8.82	Condition B, Maximum Normal load
FA1	--	90V/60Hz	781	8.82	8.82	Ditto.
FA1	10	100V/50Hz	771	7.66	7.66	Ditto.
FA1	10	100V/60Hz	770	7.68	7.68	Ditto.
FA1	6	240V/50Hz	739	3.19	3.19	Ditto.
FA1	6	240V/60Hz	739	3.22	3.22	Ditto.
FA1	--	264V/50Hz	739	2.91	2.91	Ditto.
FA1	--	264V/60Hz	739	2.94	2.94	Ditto.
FA1	--	90V/50Hz	781	8.78	8.78	Condition C, Maximum Normal load
FA1	--	90V/60Hz	781	8.79	8.79	Ditto.
FA1	10	100V/50Hz	771	7.83	7.83	Ditto.
FA1	10	100V/60Hz	770	7.84	7.84	Ditto.
FA1	6	240V/50Hz	740	3.20	3.20	Ditto.
FA1	6	240V/60Hz	739	3.23	3.23	Ditto.
FA1	--	264V/50Hz	740	2.92	2.92	Ditto.
FA1	--	264V/60Hz	740	2.94	2.94	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
FA1	--	90V/50Hz	794	8.87	8.87	Condition D, Maximum Normal load
FA1	--	90V/60Hz	794	8.88	8.88	Ditto.
FA1	10	100V/50Hz	785	7.89	7.89	Ditto.
FA1	10	100V/60Hz	785	7.91	7.91	Ditto.
FA1	6	240V/50Hz	749	3.24	3.24	Ditto.
FA1	6	240V/60Hz	748	3.29	3.29	Ditto.
FA1	--	264V/50Hz	748	2.97	2.97	Ditto.
FA1	--	264V/60Hz	746	3.00	3.00	Ditto.
For model SL-8600EPS (for T4, type ERL-39APFC used, Input rating: AC 230V)						
FA1	--	207V/50Hz	763	3.42	3.42	Condition A, Maximum Normal load
FA1	6	230V/50Hz	762	3.30	3.30	Ditto.
FA1	--	253V/50Hz	759	3.12	3.12	Ditto.
FA1	--	207V/50Hz	743	3.39	3.39	Condition B, Maximum Normal load
FA1	6	230V/50Hz	740	3.27	3.27	Ditto.
FA1	--	253V/50Hz	739	3.10	3.10	Ditto.
FA1	--	207V/50Hz	743	3.40	3.40	Condition C, Maximum Normal load
FA1	6	230V/50Hz	741	3.28	3.28	Ditto.
FA1	--	253V/50Hz	740	3.11	3.11	Ditto.
FA1	--	207V/50Hz	751	3.41	3.41	Condition D, Maximum Normal load
FA1	6	230V/50Hz	750	3.28	3.28	Ditto.
FA1	--	253V/50Hz	749	3.11	3.11	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
For model SL-8600EPS (for T4, type HKH-130x2PCS used, Input rating: AC 100-240V)						
FA1	--	90V/50Hz	801	8.96	8.96	Condition A, Maximum Normal load
FA1	--	90V/60Hz	801	8.92	8.92	Ditto.
FA1	10	100V/50Hz	796	7.96	7.96	Ditto.
FA1	10	100V/60Hz	796	7.95	7.95	Ditto.
FA1	6	240V/50Hz	760	3.22	3.22	Ditto.
FA1	6	240V/60Hz	759	3.22	3.22	Ditto.
FA1	--	264V/50Hz	758	2.94	2.94	Ditto.
FA1	--	264V/60Hz	758	2.94	2.94	Ditto.
FA1	--	90V/50Hz	780	8.80	8.80	Condition B, Maximum Normal load
FA1	--	90V/60Hz	780	8.80	8.80	Ditto.
FA1	10	100V/50Hz	770	7.65	7.65	Ditto.
FA1	10	100V/60Hz	770	7.66	7.66	Ditto.
FA1	6	240V/50Hz	738	3.17	3.17	Ditto.
FA1	6	240V/60Hz	738	3.20	3.20	Ditto.
FA1	--	264V/50Hz	739	2.90	2.90	Ditto.
FA1	--	264V/60Hz	739	2.91	2.91	Ditto.
FA1	--	90V/50Hz	780	8.76	8.76	Condition C, Maximum Normal load
FA1	--	90V/60Hz	780	8.77	8.77	Ditto.
FA1	10	100V/50Hz	770	7.82	7.82	Ditto.
FA1	10	100V/60Hz	770	7.83	7.83	Ditto.
FA1	6	240V/50Hz	739	3.18	3.18	Ditto.
FA1	6	240V/60Hz	739	3.21	3.21	Ditto.
FA1	--	264V/50Hz	740	2.90	2.90	Ditto.
FA1	--	264V/60Hz	740	2.91	2.91	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
FA1	--	90V/50Hz	793	8.85	8.85	Condition D, Maximum Normal load
FA1	--	90V/60Hz	793	8.87	8.87	Ditto.
FA1	10	100V/50Hz	782	7.86	7.86	Ditto.
FA1	10	100V/60Hz	782	7.88	7.88	Ditto.
FA1	6	240V/50Hz	748	3.22	3.22	Ditto.
FA1	6	240V/60Hz	748	3.27	3.27	Ditto.
FA1	--	264V/50Hz	746	2.91	2.91	Ditto.
FA1	--	264V/60Hz	746	2.96	2.96	Ditto.
For model SL-8600EPS (for T4, type HKH-130x2PCS used, Input rating: AC 230V)						
FA1	--	207V/50Hz	762	3.41	3.41	Condition A, Maximum Normal load
FA1	6	230V/50Hz	761	3.30	3.30	Ditto.
FA1	--	253V/50Hz	759	3.11	3.11	Ditto.
FA1	--	207V/50Hz	742	3.38	3.38	Condition B, Maximum Normal load
FA1	6	230V/50Hz	740	3.26	3.26	Ditto.
FA1	--	253V/50Hz	739	3.10	3.10	Ditto.
FA1	--	207V/50Hz	743	3.39	3.39	Condition C, Maximum Normal load
FA1	6	230V/50Hz	741	3.26	3.26	Ditto.
FA1	--	253V/50Hz	740	3.09	3.09	Ditto.
FA1	--	207V/50Hz	751	3.40	3.40	Condition D, Maximum Normal load
FA1	6	230V/50Hz	750	3.27	3.27	Ditto.
FA1	--	253V/50Hz	749	3.10	3.10	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
For model SL-8400EPS (for T4, type ERL-39APFC used, Input rating: AC 100-240V)						
FA1	--	90V/50Hz	516	5.76	5.76	Condition A, Maximum Normal load
FA1	--	90V/60Hz	516	5.76	5.76	Ditto.
FA1	8	100V/50Hz	511	5.13	5.13	Ditto.
FA1	8	100V/60Hz	512	5.13	5.13	Ditto.
FA1	4	240V/50Hz	491	2.14	2.14	Ditto.
FA1	4	240V/60Hz	490	2.14	2.14	Ditto.
FA1	--	264V/50Hz	490	1.96	1.96	Ditto.
FA1	--	264V/60Hz	490	1.97	1.97	Ditto.
FA1	--	90V/50Hz	506	5.72	5.72	Condition B, Maximum Normal load
FA1	--	90V/60Hz	506	5.72	5.72	Ditto.
FA1	8	100V/50Hz	501	5.11	5.11	Ditto.
FA1	8	100V/60Hz	502	5.11	5.11	Ditto.
FA1	4	240V/50Hz	484	2.13	2.13	Ditto.
FA1	4	240V/60Hz	483	2.12	2.12	Ditto.
FA1	--	264V/50Hz	483	1.95	1.95	Ditto.
FA1	--	264V/60Hz	483	1.95	1.95	Ditto.
FA1	--	90V/50Hz	532	5.93	5.93	Condition C, Maximum Normal load
FA1	--	90V/60Hz	532	5.93	5.93	Ditto.
FA1	8	100V/50Hz	525	5.31	5.31	Ditto.
FA1	8	100V/60Hz	526	5.31	5.31	Ditto.
FA1	4	240V/50Hz	506	2.21	2.21	Ditto.
FA1	4	240V/60Hz	506	2.21	2.21	Ditto.
FA1	--	264V/50Hz	504	2.02	2.02	Ditto.
FA1	--	264V/60Hz	505	2.02	2.02	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
FA1	--	90V/50Hz	518	5.83	5.83	Condition D, Maximum Normal load
FA1	--	90V/60Hz	518	5.83	5.83	Ditto.
FA1	8	100V/50Hz	513	5.23	5.23	Ditto.
FA1	8	100V/60Hz	513	5.23	5.23	Ditto.
FA1	4	240V/50Hz	495	2.17	2.17	Ditto.
FA1	4	240V/60Hz	495	2.17	2.17	Ditto.
FA1	--	264V/50Hz	494	1.99	1.99	Ditto.
FA1	--	264V/60Hz	495	1.99	1.99	Ditto.
For model SL-8400EPS (for T4, type ERL-39APFC used, Input rating: AC 230V)						
FA1	--	207V/50Hz	490	2.46	2.46	Condition A, Maximum Normal load
FA1	4	230V/50Hz	490	2.23	2.23	Ditto.
FA1	--	253V/50Hz	490	2.03	2.03	Ditto.
FA1	--	207V/50Hz	483	2.45	2.45	Condition B, Maximum Normal load
FA1	4	230V/50Hz	483	2.21	2.21	Ditto.
FA1	--	253V/50Hz	483	2.02	2.02	Ditto.
FA1	--	207V/50Hz	513	2.58	2.58	Condition C, Maximum Normal load
FA1	4	230V/50Hz	513	2.34	2.34	Ditto.
FA1	--	253V/50Hz	513	2.13	2.13	Ditto.
FA1	--	207V/50Hz	494	2.50	2.50	Condition D, Maximum Normal load
FA1	4	230V/50Hz	493	2.26	2.26	Ditto.
FA1	--	253V/50Hz	492	2.07	2.07	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
For model SL-8400EPS (for T4, type HKH-130x2PCS used, Input rating: AC 100-240V)						
FA1	--	90V/50Hz	515	5.75	5.75	Condition A, Maximum Normal load
FA1	--	90V/60Hz	515	5.75	5.75	Ditto.
FA1	8	100V/50Hz	511	5.12	5.12	Ditto.
FA1	8	100V/60Hz	511	5.12	5.12	Ditto.
FA1	4	240V/50Hz	490	2.13	2.13	Ditto.
FA1	4	240V/60Hz	490	2.13	2.13	Ditto.
FA1	--	264V/50Hz	490	1.96	1.96	Ditto.
FA1	--	264V/60Hz	490	1.96	1.96	Ditto.
FA1	--	90V/50Hz	505	5.71	5.71	Condition B, Maximum Normal load
FA1	--	90V/60Hz	505	5.71	5.71	Ditto.
FA1	8	100V/50Hz	501	5.11	5.11	Ditto.
FA1	8	100V/60Hz	501	5.11	5.11	Ditto.
FA1	4	240V/50Hz	483	2.12	2.12	Ditto.
FA1	4	240V/60Hz	483	2.12	2.12	Ditto.
FA1	--	264V/50Hz	482	1.94	1.94	Ditto.
FA1	--	264V/60Hz	482	1.94	1.94	Ditto.
FA1	--	90V/50Hz	532	5.93	5.93	Condition C, Maximum Normal load
FA1	--	90V/60Hz	532	5.93	5.93	Ditto.
FA1	8	100V/50Hz	525	5.31	5.31	Ditto.
FA1	8	100V/60Hz	525	5.31	5.31	Ditto.
FA1	4	240V/50Hz	505	2.20	2.20	Ditto.
FA1	4	240V/60Hz	505	2.20	2.20	Ditto.
FA1	--	264V/50Hz	504	2.01	2.01	Ditto.
FA1	--	264V/60Hz	505	2.02	2.02	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
FA1	--	90V/50Hz	517	5.83	5.83	Condition D, Maximum Normal load
FA1	--	90V/60Hz	517	5.83	5.83	Ditto.
FA1	8	100V/50Hz	513	5.22	5.22	Ditto.
FA1	8	100V/60Hz	513	5.22	5.22	Ditto.
FA1	4	240V/50Hz	495	2.17	2.17	Ditto.
FA1	4	240V/60Hz	495	2.17	2.17	Ditto.
FA1	--	264V/50Hz	494	1.98	1.98	Ditto.
FA1	--	264V/60Hz	494	1.98	1.98	Ditto.
For model SL-8400EPS (for T4, type HKH-130x2PCS used, Input rating: AC 230V)						
FA1	--	207V/50Hz	490	2.45	2.45	Condition A, Maximum Normal load
FA1	4	230V/50Hz	490	2.22	2.22	Ditto.
FA1	--	253V/50Hz	490	2.03	2.03	Ditto.
FA1	--	207V/50Hz	483	2.44	2.44	Condition B, Maximum Normal load
FA1	4	230V/50Hz	483	2.21	2.21	Ditto.
FA1	--	253V/50Hz	483	2.01	2.01	Ditto.
FA1	--	207V/50Hz	513	2.58	2.58	Condition C, Maximum Normal load
FA1	4	230V/50Hz	513	2.33	2.33	Ditto.
FA1	--	253V/50Hz	513	2.12	2.12	Ditto.
FA1	--	207V/50Hz	494	2.50	2.50	Condition D, Maximum Normal load
FA1	4	230V/50Hz	493	2.25	2.25	Ditto.
FA1	--	253V/50Hz	492	2.06	2.06	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
For model SL-8270EPS (for T4, type ERL-39APFC used, Input rating: AC 100-240V)						
FA1	--	90V/50Hz	310	3.55	3.55	Condition A, Maximum Normal load
FA1	--	90V/60Hz	310	3.55	3.55	Ditto.
FA1	6	100V/50Hz	315	3.14	3.14	Ditto.
FA1	6	100V/60Hz	313	3.14	3.14	Ditto.
FA1	4	240V/50Hz	303	1.35	1.35	Ditto.
FA1	4	240V/60Hz	302	1.37	1.37	Ditto.
FA1	--	264V/50Hz	302	1.25	1.25	Ditto.
FA1	--	264V/60Hz	302	1.27	1.27	Ditto.
FA1	--	90V/50Hz	309	3.53	3.53	Condition B, Maximum Normal load
FA1	--	90V/60Hz	310	3.52	3.52	Ditto.
FA1	6	100V/50Hz	306	3.15	3.15	Ditto.
FA1	6	100V/60Hz	306	3.15	3.15	Ditto.
FA1	4	240V/50Hz	297	1.35	1.35	Ditto.
FA1	4	240V/60Hz	297	1.36	1.36	Ditto.
FA1	--	264V/50Hz	297	1.25	1.25	Ditto.
FA1	--	264V/60Hz	297	1.27	1.27	Ditto.
FA1	--	90V/50Hz	334	3.81	3.81	Condition C, Maximum Normal load
FA1	--	90V/60Hz	335	3.81	3.81	Ditto.
FA1	6	100V/50Hz	335	3.39	3.39	Ditto.
FA1	6	100V/60Hz	335	3.39	3.39	Ditto.
FA1	4	240V/50Hz	327	1.45	1.45	Ditto.
FA1	4	240V/60Hz	327	1.46	1.46	Ditto.
FA1	--	264V/50Hz	327	1.34	1.34	Ditto.
FA1	--	264V/60Hz	327	1.36	1.36	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
FA1	--	90V/50Hz	334	3.82	3.82	Condition D, Maximum Normal load
FA1	--	90V/60Hz	333	3.83	3.83	Ditto.
FA1	6	100V/50Hz	330	3.39	3.39	Ditto.
FA1	6	100V/60Hz	331	3.40	3.40	Ditto.
FA1	4	240V/50Hz	325	1.45	1.45	Ditto.
FA1	4	240V/60Hz	325	1.46	1.46	Ditto.
FA1	--	264V/50Hz	325	1.34	1.34	Ditto.
FA1	--	264V/60Hz	325	1.36	1.36	Ditto.
For model SL-8270EPS (for T4, type ERL-39APFC used, Input rating: AC 230V)						
FA1	--	207V/50Hz	302	1.54	1.54	Condition A, Maximum Normal load
FA1	4	230V/50Hz	302	1.40	1.40	Ditto.
FA1	--	253V/50Hz	302	1.29	1.29	Ditto.
FA1	--	207V/50Hz	297	1.54	1.54	Condition B, Maximum Normal load
FA1	4	230V/50Hz	296	1.40	1.40	Ditto.
FA1	--	253V/50Hz	295	1.29	1.29	Ditto.
FA1	--	207V/50Hz	325	1.66	1.66	Condition C, Maximum Normal load
FA1	4	230V/50Hz	325	1.51	1.51	Ditto.
FA1	--	253V/50Hz	326	1.39	1.39	Ditto.
FA1	--	207V/50Hz	325	1.65	1.65	Condition D, Maximum Normal load
FA1	4	230V/50Hz	325	1.51	1.51	Ditto.
FA1	--	253V/50Hz	325	1.38	1.38	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
For model SL-8270EPS (for T4, type HKH-130x2PCS used, Input rating: AC 100-240V)						
FA1	--	90V/50Hz	309	3.54	3.54	Condition A, Maximum Normal load
FA1	--	90V/60Hz	309	3.54	3.54	Ditto.
FA1	6	100V/50Hz	313	3.12	3.12	Ditto.
FA1	6	100V/60Hz	313	3.12	3.12	Ditto.
FA1	4	240V/50Hz	302	1.34	1.34	Ditto.
FA1	4	240V/60Hz	302	1.35	1.35	Ditto.
FA1	--	264V/50Hz	301	1.24	1.24	Ditto.
FA1	--	264V/60Hz	301	1.25	1.25	Ditto.
FA1	--	90V/50Hz	309	3.52	3.52	Condition B, Maximum Normal load
FA1	--	90V/60Hz	309	3.51	3.51	Ditto.
FA1	6	100V/50Hz	306	3.14	3.14	Ditto.
FA1	6	100V/60Hz	306	3.14	3.14	Ditto.
FA1	4	240V/50Hz	296	1.35	1.35	Ditto.
FA1	4	240V/60Hz	296	1.36	1.36	Ditto.
FA1	--	264V/50Hz	296	1.25	1.25	Ditto.
FA1	--	264V/60Hz	296	1.26	1.26	Ditto.
FA1	--	90V/50Hz	334	3.80	3.80	Condition C, Maximum Normal load
FA1	--	90V/60Hz	334	3.80	3.80	Ditto.
FA1	6	100V/50Hz	335	3.38	3.38	Ditto.
FA1	6	100V/60Hz	335	3.38	3.38	Ditto.
FA1	4	240V/50Hz	326	1.45	1.45	Ditto.
FA1	4	240V/60Hz	326	1.45	1.45	Ditto.
FA1	--	264V/50Hz	326	1.34	1.34	Ditto.
FA1	--	264V/60Hz	326	1.35	1.35	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
FA1	--	90V/50Hz	333	3.82	3.82	Condition D, Maximum Normal load
FA1	--	90V/60Hz	333	3.82	3.82	Ditto.
FA1	6	100V/50Hz	330	3.39	3.39	Ditto.
FA1	6	100V/60Hz	330	3.39	3.39	Ditto.
FA1	4	240V/50Hz	324	1.45	1.45	Ditto.
FA1	4	240V/60Hz	324	1.45	1.45	Ditto.
FA1	--	264V/50Hz	324	1.34	1.34	Ditto.
FA1	--	264V/60Hz	324	1.35	1.35	Ditto.
For model SL-8270EPS (for T4, type HKH-130x2PCS used, Input rating: AC 230V)						
FA1	--	207V/50Hz	302	1.53	1.53	Condition A, Maximum Normal load
FA1	4	230V/50Hz	302	1.40	1.40	Ditto.
FA1	--	253V/50Hz	302	1.28	1.28	Ditto.
FA1	--	207V/50Hz	297	1.53	1.53	Condition B, Maximum Normal load
FA1	4	230V/50Hz	296	1.40	1.40	Ditto.
FA1	--	253V/50Hz	295	1.29	1.29	Ditto.
FA1	--	207V/50Hz	325	1.65	1.65	Condition C, Maximum Normal load
FA1	4	230V/50Hz	325	1.50	1.50	Ditto.
FA1	--	253V/50Hz	326	1.39	1.39	Ditto.
FA1	--	207V/50Hz	325	1.65	1.65	Condition D, Maximum Normal load
FA1	4	230V/50Hz	325	1.50	1.50	Ditto.
FA1	--	253V/50Hz	325	1.38	1.38	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)	P

Note:

For model SL-8600EPS

Condition A: +3.3V/24A, +5V/14.16A, +12V1/18.1A, +12 V2/18.1A, -12V/0.5A, +5VSB/2.5A
Condition B: +3.3V/0A, +5V/11.4A, +12V1/22A, +12 V2/22A, -12V/0.5A, +5VSB/2.5A
Condition C: +3.3V/17.27A, +5V/0A, +12 V1/22A, +12 V2/22A, -12V/0.5A, +5VSB/2.5A
Condition D: +3.3V/0A, +5V/30A, +12 V1/18.1A, +12 V2/18.1A, -12V/0.5A, +5VSB/2.5A

For model SL-8400EPS

Condition A: +3.3V/0A, +5V/12.2A, +12 V1/14A, +12 V2/13A, -12V/0.5A, +5VSB/2.5A
Condition B: +3.3V/18.5A, +5V/0A, +12 V1/14A, +12 V2/13A, -12V/0.5A, +5VSB/2.5A
Condition C: +3.3V/20A, +5V/10.8A, +12 V1/11.04A, +12 V2/11.04A, -12V/0.5A, +5VSB/2.5A
Condition D: +3.3V/9.1A, +5V/18A, +12 V1/11.04A, +12 V2/11.04A, -12V/0.5A, +5VSB/2.5A

For model SL-8270EPS

Condition A: +3.3V/0A, +5V/0A, +12 V1/8A, +12 V2/11.6A, -12V/0.5A, +5VSB/2.5A
Condition B: +3.3V/0A, +5V/0A, +12 V1/6.6A, +12 V2/13A, -12V/0.5A, +5VSB/2.5A
Condition C: +3.3V/16A, +5V/12.44A, +12 V1/5A, +12 V2/5A, -12V/0.5A, +5VSB/2.5A
Condition D: +3.3V/15.16A, +5V/13A, +12 V1/5A, +12 V2/5A, -12V/0.5A, +5VSB/2.5A

2.1.1.5	TABLE: Energy hazard					P
ITEM	VOLTAGE (RATED)	CURRENT (RATED)	VOLTAGE (MAX.)	CURRENT (MAX.)	V.A. (W) (MAX.)	COMMENTS
1	3.3V	24	3.58	34	90.7	
2	5V	30	5.19	30	127.5	
3	12V1	22	13.7	22	277.2	
4	12V2	22	14.0	22	272.8	
5	5Vsb	0.5	5.02	4.2	20.1	
6	-12V	2	15.7	1.0	12.1	

Input voltage: 240Vac, 60Hz

Note: The output from the power supply represents an energy hazard: 278VA must be considered for the end product.

Cl.	Requirement - Test	Result - Remark	Verdict

2.1.1.7	TABLE: Discharge test				P
Condition		Switch Position	τ calculated (s)	τ measured (s)	comments
Appliance Inlet L-N (Fuse in)		--	1.33	0.216	Vo= 348 V 37% x Vo= 128 V $V_{t=1sec}$= 0 V
Appliance Inlet L-N (Fuse out)		--	1.0	0.920	Vo= 348 V 37% x Vo= 128 V $V_{t=1sec}$= 0 V
EMI filter : with EMI board					
Overall capacity: 1.0uF=CXA1(EMI board), 0.33uF=CX1 (Main board)					
Discharge resistor: 1MΩ=RA1 (EMI board)					

2.2.2	TABLE: Hazardous voltage (circuit) Measurement Test			
Transformer designation	Location	Maximum Voltage	Voltage Limiting Component	Comments
T1	Pin 13, 14 to pin A	84Vpk	--	--
T1	Pin 13, 14 to pin A	74Vpk	D10	--
T1	Pin 13, 14 to pin A	20Vdc	CL1	Service for +12Vdc output, refer to table 2.3.2, 2.3.3 for SELV Reliability Test
T1	Pin 8, 9 to pin 11, 12	36Vpk	--	--
	Pin B to pin 10	37Vpk	--	--
T3	Pin 3 – Pin 4	34Vpk	--	--

Cl.	Requirement - Test	Result - Remark	Verdict

2.2.2, 2.2.3, 2.2.4	TABLE: SELV Reliability Test					P
Accessible Part (From to)	Voltage Limiting Component	Fault	Maxium Vpk/dc	Duration (ms)	result	
Output (+12V to -)	CL1	Short	0Vdc	--	Unit shut down.	
After the fault introduction, the voltage did not exceed 42.4 V pk or 60 V dc for longer than 0.2 seconds. In addition, a limit of 71 V pk or 120 V dc was not exceeded.						

Cl.	Requirement - Test	Result - Remark	Verdict

2.10.2	Table: Working voltage measurement		P
Location	Peak Voltage (V)	RMS Voltage (V)	Comments [1])
T1 Pin 1 to pin A	495	215	
T1 Pin 5 to pin A	350	171	
T1 Pin 7 to pin A	352	172	
T1 Pin 1 to pin 11, 12	496	226	
T1 Pin 5 to pin 11, 12	375	171	
T1 Pin 7 to pin 11, 12	380	172	
T1 Pin 1 to pin 13, 14	**500***	**240***	
T1 Pin 5 to pin 13, 14	400	171	
T1 Pin 7 to pin 13, 14	410	174	
T1 Pin 1 to pin 8, 9	480	208	
T1 Pin 5 to pin 8, 9	350	173	
T1 Pin 7 to pin 8, 9	355	175	
T1 Pin 1 to pin B	493	223	
T1 Pin 5 to pin B	360	170	
T1 Pin 7 to pin B	365	171	
T3 Pin 3 to pin 5	422	172	
T3 Pin 3 to pin 6	366	170	
T3 Pin 3 to pin 7	522	343	
T3 Pin 3 to pin 10	436	305	
T3 Pin 4 to pin 5	458	175	
T3 Pin 4 to pin 6	350	169	
T3 Pin 4 to pin 7	**560***	**350***	
T3 Pin 4 to pin 10	422	305	

Cl.	Requirement - Test	Result - Remark	Verdict

2.10.2	Table: Working voltage measurement		P
Location	Peak Voltage (V)	RMS Voltage (V)	Comments [1])
U8 Pin1 to pin 3	378	177	
U8 Pin 1 to pin 4	378	174	
U8 Pin 2 to pin 3	378	177	
U8 Pin 2 to pin 4	378	174	
U9 Pin 1 to pin 3	380	174	
U9 Pin 1 to pin 4	380	172	
U9 Pin 2 to pin 3	380	174	
U9 Pin 2 to pin 4	380	172	
U10 Pin 1 to pin 3	380	176	
U10 Pin 1 to pin 4	380	172	
U10 Pin 2 to pin 3	380	176	
U10 Pin 2 to pin 4	380	172	

Cl.	Requirement - Test	Result - Remark	Verdict

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements	P

clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
primary components(with 10N) → earthed trace or metal chassis or PE heatsink	**<420**	**<250**	**2.0**	↓	**2.5**	↓
Primary heatsink (HS1) to metal chassis				≥4.81		≥4.81
C2 to metal chassis				≥3.39		≥3.39
C5 to metal chassis				≥4.82		≥4.28
R1(on IC Board) to metal chassis				≥7.48		≥7.48
primary traces→earthed trace or metal case	**<420**	**<250**	**2.0**	↓	**2.5**	↓
Under CY1				6.88		6.88
L to PE trace				≥3.57		≥3.57
T4 (isolated by mylar sheet) to metal chassis				≥2.5		≥2.5
Primary traces to PE (metal chassis) near R37				≥4.03		≥4.03
primary components (with 10N) →secondary components (with 10N)	**<420**	**<250**	**4.0**	↓	**5.0**	↓
D6 to U2				≥12.08		≥12.08
pri. →sec. traces	**<420**	**<250**	**4.0**	↓	**5.0**	↓
Under U8				≥6.85		≥6.85
Under U9, U10				≥6.16		≥6.16
pri. →sec. traces under T1	500	240	4.0+0.4	≥6.58	5.0	≥6.58
pri. →sec. traces under T3	560	350	4.0+0.4	≥7.0	7.2	≥8.2
Between Fuse (FA1, located on EMI board) two ends (basic insulation)	**<420**	**<250**	**2.0**	≥2.5	**2.5**	≥2.5

Note:

1. The CTI rating of PCB is material group IIIb (Cl. 2.10.4).
2. Separation Method between SELV and hazard circuit (Cl. 2.2.3) by double or reinforced insulation (Method 1).
3. Functional insulation shorted, see Cl. 5.3.4.
4. There is a mylar sheet between under main board primary circuit and metal chassis for basic insulation.
5. Between L1 and BD1 are isolated by Mylar.
6. The primary side of circuit that close to RT1 is isolated to side metal case for basic insulation by mylar (the about area=100mmx43mm)
7. The transformer T2 is not bridge to primary and secondary side that only used for primary component, the insulation distance is not required.

Cl.	Requirement - Test	Result - Remark	Verdict

4.5	TABLE: Maximum temperatures		P
	test voltage (V) .....:	90V/264V	—
	tamb1(°C) .....:	--	—
	tamb2(°C) .....:	--	—

Maximum temperature T of part/at:	T(°C)		AllowedTmax (°C)
For model SL-8600EPS (Condition A: +3.3V/24A, +5V/14.16A, +12V1/18.1A, +12 V2/18.1A, -12V/0.5A, +5VSB/2.5A, for T4, type HKH-130x2PCS used + Enclosure shape A)			
Test voltage	90V	264V	--
1.T1 coil	86.1	73.9	90
2.T1 core	77.8	66.3	90
3.T3 coil	55.6	52.2	90
4.T3 core	54.6	51.2	90
5.U10 body	63.6	52.0	100
6.U9 body	67.0	55.5	100
7.U8 body	46.0	53.2	100
8.LF1 coil	86.7	51.7	130
9.CX1 body	75.2	52.2	100
10.PWB under BD1	124.1	65.4	130
11.T4 coil	91.3	49.4	130
12.CY1 body	46.0	41.2	85
13.C2 body	59.6	48.0	105
14.PWB under Q1 near Heatsink	67.0	51.8	130
15.PWB under Q2	63.1	52.6	130
16.T2 coil	75.7	58.9	90
17.CLF1 body (for EMI board)	82.5	50.2	130
18.CXA1 body (for EMI board)	75.7	50.2	100
19.CCY2 body (for EMI board)	61.2	47.7	85
20.AC inlet body	59.4	51.1	65
21.CL1 coil	89.8	80.2	130
22.L4 coil	99.0	92.3	130
23.L5 coil	114.0	96.8	130
25.Enclosure outside	56.9	48.1	70
26.Ambient	40.0	40.0	--

Cl.	Requirement - Test	Result - Remark	Verdict

4.5	TABLE: Maximum temperatures		P
	test voltage (V) .....:	90V/264V	—
	tamb1(°C) .....:	--	—
	tamb2(°C) .....:	--	—

Maximum temperature T of part/at:	T(°C)		AllowedTmax (°C)
For model SL-8600EPS (Condition A: +3.3V/24A, +5V/14.16A, +12V1/18.1A, +12 V2/18.1A, -12V/0.5A, +5VSB/2.5A, for T4, type HKH-130x2PCS used + Enclosure shape B + DC fan type: RL4BB1402512MB)			
Test voltage	90V	264V	--
1.T1 coil	85.9	83.1	90
2.T1 core	84.1	80.7	90
3.T3 coil	62.3	60.0	90
4.T3 core	59.8	57.4	90
5.U10 body	65.4	60.4	100
6.U9 body	79.4	74.5	100
7.U8 body	47.6	44.9	100
8.LF1 coil	63.7	45.4	130
9.CX1 body	65.3	48.3	100
10.PWB under BD1	75.0	51.8	130
11.T4 coil	57.3	49.9	130
12.CY1 body	48.3	45.3	85
13.C2 body	51.3	47.2	105
14.PWB under Q1 near Heatsink	76.9	55.4	130
15.PWB under Q2	57.3	52.1	130
16.T2 coil	77.8	68.5	90
17.CLF1 body (for EMI board)	85.9	52.6	130
18.CXA1 body (for EMI board)	63.9	49.1	100
19.CCY2 body (for EMI board)	53.4	46.5	85
20.AC inlet body	53.6	47.1	65
21.CL1 coil	104.3	100.5	130
22.L4 coil	88.2	84.6	130
23.L5 coil	66.8	63.5	130
25.Enclosure outside	45.8	42.1	70
26.Ambient	40.0	40.0	--

Cl.	Requirement - Test	Result - Remark	Verdict

4.5	TABLE: Maximum temperatures		P
	test voltage (V) .....:	90V/264V	—
	tamb1(°C) .....:	--	—
	tamb2(°C) .....:	--	—

Maximum temperature T of part/at:	T(°C)		AllowedTmax (°C)
For model SL-8600EPS (Condition A: +3.3V/24A, +5V/14.16A, +12V1/18.1A, +12 V2/18.1A, -12V/0.5A, +5VSB/2.5A, for T4, type HKH-130x2PCS used + Enclosure shape C + DC fan type: LF1225B1HR40AR)			
Test voltage	90V	264V	--
1.T1 coil	87.8	82.0	90
2.T1 core	79.2	77.5	90
3.T3 coil	67.0	66.8	90
4.T3 core	65.1	65.7	90
5.U10 body	49.2	48.2	100
6.U9 body	62.3	60.9	100
7.U8 body	53.6	53.8	100
8.LF1 coil	48.4	65.3	130
9.CX1 body	46.7	48.8	100
10.PWB under BD1	49.6	67.7	130
11.T4 coil	56.1	74.6	130
12.CY1 body	48.8	50.5	85
13.C2 body	49.4	52.4	105
14.PWB under Q1 near Heatsink	52.2	69.3	130
15.PWB under Q2	59.4	67.9	130
16.T2 coil	64.5	67.3	90
17.CLF1 body (for EMI board)	49.3	70.7	130
18.CXA1 body (for EMI board)	45.4	58.7	100
19.CCY2 body (for EMI board)	45.0	51.0	85
20.AC inlet body	43.8	48.3	65
21.CL1 coil	91.1	92.8	130
22.L4 coil	60.9	54.6	105
23.L5 coil	83.2	76.0	105
25.Enclosure outside	43.1	40.7	70
26.Ambient	40.0	40.0	--

Cl.	Requirement - Test	Result - Remark	Verdict

4.5	TABLE: Maximum temperatures (continue)					P
temperature rise T of winding:		R_1 (Ω)	R_2 (Ω)	T (°C)	required Tmax (°C)	insulation class
--		--	--	--	--	--
--		--	--	--	--	--

Comments:

The temperatures were measured by thermal couple (type T) method under worst case normal mode defined in 1.2.2.1and as described in 1.6.2 at voltage described in 1.4.5. The worst case at normal mode is defined with max load of the equipment.

With max. ambient temperature specified as 40°C, therefore, the maximum temperature rise is calculated as follows:

Winding components:

- class A $\rightarrow$100 - 10 = 90°C

Components with:

- max. temp. of 130°C (PCB)
- max. temp. of 105°C or 130°C (Line choke)
- max. temp. of 85°C (Y capacitor)
- max. temp. of 100°C (X capacitor)
- max. temp. of 105°C (Ripple capacitor)
- max. temp. of 65°C (AC Inlet)
- max. temp. of 100°C (Photo coupler)
- when no class of insulation is given, min. insulation 105°C assumed.

User accessible area:

- material is metal (70°C)

Note: All vendors of transformer source are evaluated with highest temperature recorded.

Cl.	Requirement - Test	Result - Remark	Verdict

5.1	TABLE: Touch current measurement		P
	Normal	**The tests are repeated in reverse polarity**	
Condition	Current (mA) L, N→PE	Current (mA) L, N→PE	Comments
System ON	0.75	0.75	for metal chassis
System OFF	0.80	0.70	for metal chassis
Input voltage: 264V			
Input frequency: 60Hz			
Overall capacity: CY1= CCY1=CCY2= 4700pF			

5.2	TABLE: Electric strength measurements		P
test voltage applied between:		test voltage (V)	breakdown
For unit:			
Appliance inlet (L – N) / SELV connector		4242Vdc	No
Appliance inlet (L – N) / Protective Earth		2594Vdc	No
For insulated transformer (T1):			
Two layers of insulation		3000Vac	No
T1 primary windings and SELV windings		3000Vac	No
T1 secondary windings and core		3000Vac	No
Note: Same results for all sources of insulated transformer.			

Cl.	Requirement - Test	Result - Remark	Verdict

5.3	TABLE: Fault condition tests		P
	ambient temperature (°C) .....:	25°C or see below	—
	model/type of power supply .....:	See below	—
	manufacturer of power supply .....:	See page 2	—
	rated markings of power supply .....:	See marking plates	—

table .No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
1.	DC Fan on top (for enclosure shape A)	Stalled	240	4 hrs	FA1	→ 0.16	Unit shutdown, no hazards, the maximum temp, T1 coil = 101.8°C, T3 coil = 86.2°C, Ambient = 27.0°C.
2.	DC Fan on side (for enclosure shape A)	Stalled	240	4 hrs	FA1	→ 0.16	Unit shutdown, no hazards, the maximum temp, T1 coil = 94.8°C, T3 core = 99.2°C, Ambient = 20.2°C.
3.	DC Fan (for enclosure shape B)	Stalled	240	3 hrs	FA1	→ 0.16	Unit shutdown, no hazards, the maximum temp, T1 coil = 76.3°C, T3 coil = 83.9°C, Ambient = 23.2°C.
4.	DC Fan (for enclosure shape C)	Stalled	240	3.5 hrs	FA1	→ 0.16	Unit shutdown, no hazards, the maximum temp, T1 coil = 75.2°C, T3 coil = 85.9°C, Ambient = 21.9°C.
5.	Ventilation opening	Blocked	240	3.5 hrs	FA1	→ 0.16	Unit shutdown, no hazards, the maximum temp, T1 coil = 77.2°C, T3 coil = 89.3°C, Ambient t= 23.0°C.
6.	T1 pin 13, 14 to pin A after D10	o-l	240	4.5 hrs	FA1	3.23 → 0.16	Unit shutdown, no hazards, while output 2.15A, the maximum temp, T1 coil = 92.2°C, T3 coil = 58.1°C, Ambient = 23.2°C.
7.	T1 pin 8, 9 to pin 11, 12 after D9	o-l	240	3 hrs	FA1	3.34 → 0.16	Unit shutdown, no hazards, while output 5.5A, the maximum temp, T1 coil = 89.4°C, T3 coil = 55.3°C, Ambient = 22.7°C.

Cl.	Requirement - Test	Result - Remark	Verdict

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
8.	T1 pin B to pin 10 after D8	o-l	240	2.5 hrs	FA1	3.35 → 0.15	Unit shutdown, no hazards, while output 6A, the maximum temp, T1 coil = 96.2°C, T3 coil = 60.6°C, Ambient = 24.1°C.
9.	T3 pin 3 to pin 4 after D7	o-l	240	3 hrs	FA1	3.355 →0.15	Unit shutdown, no hazards, , while output 0.5A, the maximum temp, T1 coil = 91.7°C, T3 coil = 59.2°C, Ambient = 23.4°C.
10.	T1 pin 13, 14 to pin A	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
11.	T1 pin 8, 9 to pin 11, 12	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
12.	T1 pin B to pin 10	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
13.	T1 pin 1 to pin 7	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
14.	T1 pin 1 to pin 5	s-c	240	<1sec	FA1	→0	Fuse opened immediately, BD1 damaged, no hazards.
15.	T1 pin 7 to pin 5	s-c	240	<1sec	FA1	→0	Fuse opened immediately, BD1 damaged, no hazards.
16.	T3 pin 3 to pin 4	s-c	240	10min	FA1	→ 0.15	Unit shutdown immediately, no component damaged, no hazards.
17.	T3 pin 5 to pin 6	s-c	240	10min	FA1	→ 0.15	Unit shutdown immediately, no component damaged, no hazards.
18.	T3 pin 7 to pin 10	s-c	240	10min	FA1	→ 0.15	Unit shutdown immediately, no component damaged, no hazards.
19.	+5V to Return	o-l	240	3.5 hrs	FA1	3.43 → 0.16	Unit shutdown, no hazards. while output load = 27A, the maximum temp, T1 coil = 99.4°C, T3 coil = 76.9°C, Ambient = 23.8°C

Cl.	Requirement - Test	Result - Remark	Verdict

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
20.	+3.3V to Return	o-l	240	4 hrs	FA1	3.36 → 0.16	Unit shutdown, no hazards. while output load = 33A, the maximum temp, T1 coil = 99.5°C, T3 coil = 78.0°C, Ambient = 22.6°C
21.	+12V1 to Return	o-l	240	5 hrs	FA1	3.34 → 0.16	Unit shutdown, no hazards. while output load = 21A, the maximum temp, T1 coil = 99.1°C, T3 coil = 80.1°C, Ambient = 23.4°C
22.	+12V2 to Return	o-l	240	4.5 hrs	FA1	3.34 → 0.16	Unit shutdown, no hazards. while output load = 21A, the maximum temp, T1 coil = 99.6°C, T3 coil = 62.1°C, Ambient = 24.2°C
23.	+5Vsb to Return	o-l	240	3.5 hrs	FA1	3.28 → 0.16	Unit shutdown, no hazards. while output load = 3.3A, the maximum temp, T1 coil = 92.6°C, T3 coil = 60.2°C, Ambient = 23.0°C
24.	-12V to Return	o-l	240	3 hrs	FA1	3.25 → 0.15	Unit shutdown, no hazards. while output load = 0.92A, the maximum temp, T1 coil = 89.4°C, T3 coil = 55.3°C, Ambient = 22.5°C
25.	+5V to Return	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
26.	+3.3V to Return	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
27.	+12V1 to Return	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
28.	+12V2 to Return	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
29.	+5Vsb to Return	s-c	240	10min	FA1	→ 0.15	Unit shutdown immediately, no component damaged, no hazards.

Cl.	Requirement - Test	Result - Remark	Verdict

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
30.	-12V to Return	s-c	240	10min	FA1	→ 0.16	Unit shutdown immediately, except for +5Vsb operated normally, no hazards,
supplementary information							
Fault: s-c=short-circuited, o-c=open-circuited, o-l=over-loaded							
Note: 1. While fuse opened, same results came out for all sources of fuse. 2. All vendors of transformer source are evaluated with highest temperature recorded. 3. Unless otherwise specified, the tests were performed for Enclosure shape C (with DC fan: LF1225B1HR40AR)							

Product Service

TEST REPORT

IEC 60950-1 First Edition

Information technology equipment – Safety –

Part 1: General requirements

Report reference No ..... :	081-51032-100	
Date of issue ..... :	2006-12-12	
Appendix to test report, Ref.No. ..... :	081-51032-000	
Modification on the Appliance..... :	See page 6	
Modification to Clause..... :	See page 6	
Pages concerned ..... :	1, 2, 4, 5, 8, 54, 63, 66	
Tested by (printed name and signature) ..... :	Manfred Schmolke	.....
Approved by (printed name and signature) ..... :	Ralph Fischer	.....

Testing Laboratory Name ..... :	TÜV SÜD Product Service GmbH
Address ..... :	Ridlerstr. 65, D-80339 München
Testing location ..... :	CBTL
Address ..... :	Ridlerstr. 65, D-80339 München

Applicant's Name ..... :	Solytech Enterprise Corporation
Address ..... :	3F, 18, Wu Chun 7 Rd., Wu Gu Ind. Area, 248 Wu Gu Shiang, Taipei, Taiwan

Test specification	
Standard..... :	IEC 60950-1:2001, First Edition
Test procedure ..... :	CB –Scheme
Non-standard test method ..... :	N

Test Report Form No. ..... :	SL-XXXXEPS-M1.DOC
TRF originator. ..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2001-12

Test item description ..... :	Switching Power Supply
Trademark ..... :	**SOLY**
Model and/or type reference ..... :	SL-XXXXEPS, MS-4600
	(“XXXX” can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550 or 8600)
Manufacturer ..... :	Same as applicant.
Factory (ies) ……..:	See next page
Rating(s) ..... :	I/P: 115/230 Vac, 60/50 Hz, 10/6 A
	O/P: see page 4 for details

Particulars: test item vs. test requirements

Equipment mobility ..... :	Build-in
Operating condition..... :	Continuous
Mains supply tolerance (%) ..... :	+10%, -10%
Tested for IT power systems ..... :	N
IT testing, phase-phase voltage(V) :	N
Class of equipment ..... :	Class I
Mass of equipment (kg) ..... :	Approx. 1.91
Protection against ingress of water :	Ordinary

Possible test case verdicts:

- test case does not apply to the test object .....: N(.A.)
- test object does meet the requirement .....: P(ass)
- test object does not meet the requirement .....: F(ail)

Attachments:

Testing

Date of receipt of test item .....: 2006-11-16

Date(s) of performance of test .....: 2006-11-20 to 2006-11-22

General remarks:

”This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IECEE 02”.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item(s) tested.

”(see remark #)" refers to a remark appended to the report.

"(see Annex #)" refers to an annex appended to the report.

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

Factory (ies) :

1) Deer Electronics (Dongguan) Co., Ltd. (Factory ID No.: 50076)
ChangShan Tou, Management Area, Qing Xi, Dongguan, Guangdong, People's Republic of China

2) Qxan Xiang Electronic Co.,Ltd. (Factory ID No.: 52537)
FuGang Ind.Section Qingxi Town, 523660 Dong Guan City, Guang Dong, People's Republic of China

General descriptions:

This equipment is switching power supply (built-in type) for use in information technology equipment.

The model SL-XXXXEPS, where “XXXX” can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550 or 8600 to denote different output rating.

All models of series are similar to model SL-8600EPS except for output rating and model designation.

The model SL-8600EPS is identical to model MS-4600 except for model name.

The output rating for all models are as below:

Model Name	Output Ratings(DC)								
	+3.3V	+5V	+12V1	+12V2	-12V	+5VSB	+5V & +3.3V	+5V & +3.3V & 12V	Total Max Watt
SL-8220EPS	10A	8A	6A	9A	0.5A	2.5A	70W	185W	200W
SL-8240EPS	12A	10A	6A	10A	0.5A	2.5A	80W	220W	235W
SL-8270EPS	16A	13A	8A	13A	0.5A	2.5A	115W	235W	250W
SL-8320EPS	18A	14A	8A	13A	0.5A	2.5A	120W	285W	300W
SL-8360EPS	20A	16A	10A	13A	0.5A	2.5A	130W	335W	350W
SL-8400EPS	20A	18A	14A	13A	0.5A	2.5A	130W	385W	400W
SL-8460EPS	24A	20A	18A	15A	0.5A	2.5A	130W	445W	460W
SL-8500EPS	24A	22A	18A	18A	0.5A	2.5A	130W	485W	500W
SL-8550EPS	24A	24A	20A	18A	0.5A	2.5A	140W	535W	550W
SL-8600EPS MS-4600	24A	30A	22A	22A	0.5A	2.5A	150W	585W	600W

Unless otherwise specified, all tests were performed on model MS-4600 to represent the other similar models.

Copy of marking plate:

Report No. <081-51032-100>

The construction of the switching power supply models SL-XXXXEPS and MS-4600 were modified as follows:

1. Add new models SL-8220EPS, SL-8240EPS, SL-8270EPS, SL-8320EPS, SL-8360EPS and SL-8400EPS.
2. Change output current rating of +5VSB from 2.0A to 2.5A for all original models.
3. Change output power rating of +5V & +3.3V from 120W to 130W for model SL-8460EPS.

For the above described modification the following Clause/Testing was considered to be necessary:

Modification	Clause/Testing	Remark/Comments	Verdict
1.	Clause 1.7	Marking and instructions	P
2.	Table 1.6.2	Electrical data (in normal conditions)	P
3.	Table 4.5	Maximum temperatures	P
4.	Table 5.2	Electric strength measurements	P

Cl.	Requirement - Test	Result - Remark	Verdict

1.7	Marking and instructions		P
1.7.1	Type/model or type reference .....:	SL-XXXXEPS, MS-4600 (“XXXX” can be 8220, 8240, 8270, 8320, 8360, 8400, 8460, 8500, 8550 or 8600)	P

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
F1	--	103V/50Hz	835	8.17	8.17	Condition A, Maximum Normal load
F1	--	103V/60Hz	837	8.16	8.16	Ditto.
F1	10	115V/50Hz	829	7.27	7.27	Ditto.
F1	10	115V/60Hz	829	7.27	7.27	Ditto.
F1	--	127V/50Hz	821	6.57	6.57	Ditto.
F1	--	127V/60Hz	821	6.55	6.55	Ditto.
F1	--	207V/50Hz	789	3.96	3.96	Ditto.
F1	--	207V/60Hz	789	3.94	3.94	Ditto.
F1	6	230V/50Hz	785	3.56	3.56	Ditto.
F1	6	230V60Hz	784	3.55	3.55	Ditto.
F1	--	253V/50Hz	783	3.23	3.23	Ditto.
F1	--	253V/60Hz	782	3.23	3.23	Ditto.
F1	--	103V/50Hz	824	8.02	8.02	Condition B, Maximum Normal load
F1	--	103V/60Hz	825	8.02	8.02	Ditto.
F1	10	115V/50Hz	813	7.13	7.13	Ditto.
F1	10	115V/60Hz	813	7.12	7.12	Ditto.
F1	--	127V/50Hz	805	6.45	6.45	Ditto.
F1	--	127V/60Hz	804	6.42	6.42	Ditto.
F1	--	207V/50Hz	775	3.89	3.89	Ditto.
F1	--	207V/60Hz	774	3.87	3.87	Ditto.
F1	6	230V/50Hz	772	3.49	3.49	Ditto.
F1	6	230V60Hz	771	3.49	3.49	Ditto.
F1	--	253V/50Hz	768	3.17	3.17	Ditto.
F1	--	253V/60Hz	768	3.17	3.17	Ditto.

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
F1	--	103V/50Hz	832	8.13	8.13	Condition C, Maximum Normal load
F1	--	103V/60Hz	832	8.12	8.12	Ditto.
F1	10	115V/50Hz	824	7.23	7.23	Ditto.
F1	10	115V/60Hz	825	7.22	7.22	Ditto.
F1	--	127V/50Hz	815	6.54	6.54	Ditto.
F1	--	127V/60Hz	816	6.52	6.52	Ditto.
F1	--	207V/50Hz	786	3.94	3.94	Ditto.
F1	--	207V/60Hz	786	3.93	3.93	Ditto.
F1	6	230V/50Hz	783	3.55	3.55	Ditto.
F1	6	230V60Hz	783	3.54	3.54	Ditto.
F1	--	253V/50Hz	780	3.22	3.22	Ditto.
F1	--	253V/60Hz	779	3.32	3.32	Ditto.
F1	--	103V/50Hz	825	8.04	8.04	Condition D, Maximum Normal load
F1	--	103V/60Hz	824	8.02	8.02	Ditto.
F1	10	115V/50Hz	813	7.13	7.13	Ditto.
F1	10	115V/60Hz	810	7.12	7.12	Ditto.
F1	--	127V/50Hz	802	6.42	6.42	Ditto.
F1	--	127V/60Hz	801	6.39	6.39	Ditto.
F1	--	207V/50Hz	772	3.87	3.87	Ditto.
F1	--	207V/60Hz	772	3.86	3.86	Ditto.
F1	6	230V/50Hz	768	3.48	3.48	Ditto.
F1	6	230V60Hz	767	3.47	3.47	Ditto.
F1	--	253V/50Hz	765	3.16	3.16	Ditto.
F1	--	253V/60Hz	765	3.16	3.16	Ditto.

Note:

Condition A for 3.3V/24A, 5V/14.16A, 12V1/18.1A, 12V2/18.1A, -12V/0.5A, +5Vsb/2.5A
Condition B for 3.3V/0A, 5V/21A, 12V1/20A, 12V2/20A, -12V/0.5A, +5Vsb/2.5A
Condition C for 3.3V/24A, 5V/5.16A, 12V1/20A, 12V2/20A, -12V/0.5A, +5Vsb/2.5A
Condition D for 3.3V/0A, 5V/30A, 12V1/18.1A, 12V2/18.1A, -12V/0.5A, +5Vsb/2.5A

Cl.	Requirement - Test	Result - Remark	Verdict

4.5	TABLE: maximum temperatures			P
	test voltage (V) .....:	103V/253V		—
	tamb1(°C) .....:	--		—
	tamb2(°C) .....:	--		—
Maximum temperature T of part/at:		T(°C)		AllowedTmax (°C)
Condition A for 3.3V/24A, 5V/14.16A, 12V1/18.1A, 12V2/18.1A, -12V/0.5A, +5Vsb/2.5A				
1.T1 coil		75.3	69.3	90
2.T1 core		68.8	67.7	90
3.T3 core		70.1	69.2	90
4.T3 coil		70.3	69.8	90
5.PH1 body		57.3	54.4	100
6.PH2 body		68.0	66.4	100
7.PH3 body		59.9	59.6	100
8.AC inlet body		54.5	49.0	65
9.Power Switch body		63.0	57.4	105
10.CCX1 body (for EMI board)		71.3	52.9	100
11.CLF1 body (for EMI board)		55.2	51.5	130
12.CCY1 body (for EMI board)		62.4	50.2	85
13.CCY2 body (for EMI board)		57.9	49.6	85
14.CL2 body		71.3	52.5	130
15.CX1 body		94.4	73.5	100
16.L1 coil		102.5	65.7	130
17.CX2 body		83.6	63.2	100
18.PWB under BD1		106.6	72.5	130
19.F2 coil		86.0	64.3	130
20.PWB under RT1		79.4	64.2	130
21.CY1 body		56.7	51.2	85
22.C2 body		55.8	51.2	105
23.PWB under Q1 near Heatsink		83.1	64.6	130
24.T2 coil		75.3	73.5	90
25.PWB under D9 near Heatsink		96.5	58.0	130
26.CL1 coil		59.2	58.5	130

Cl.	Requirement - Test	Result - Remark	Verdict

Maximum temperature T of part/at:	T(°C)		AllowedTmax (°C)
27.Ambient	40.0	40.0	--

temperature rise T of winding:	R_1 (Ω)	R_2 (Ω)	T (°C)	required Tmax (°C)	insulation class
--	--	--	--	--	--
--	--	--	--	--	--

Comments:

The temperatures were measured by thermal couple (type T) method under worst case normal mode defined in 1.2.2.1and as described in 1.6.2 at voltage described in 1.4.5. The worst case at normal mode is defined with max load of the equipment.

With max. ambient temperature specified as 40°C, therefore, the maximum temperature rise is calculated as follows:

Winding components:

- class A $\rightarrow$100 - 10 = 90°C

Components with:

- max. temp. of 130°C (PCB)
- max. temp. of 130°C (Line choke)
- max. temp. of 85°C (Y capacitor)
- max. temp. of 100°C (X capacitor)
- max. temp. of 105°C (Ripple capacitor)
- max. temp. of 65°C (AC Inlet)
- max. temp. of 100°C (Photo coupler)
- when no class of insulation is given, min. insulation 105°C assumed.

Cl.	Requirement - Test	Result - Remark	Verdict

5.2	TABLE: electric strength measurements		P
test voltage applied between:		test voltage (V)	breakdown
Appliance inlet (L – N) / SELV connector		4242Vdc	No
Appliance inlet (L – N) / Protective Earth		2636Vdc	No

TÜV
PRODUCT SERVICE

TEST REPORT

IEC 60950-1 First Edition

Information technology equipment – Safety –

Part 1: General requirements

Report reference No.	081-51032-000	
Tested by (printed name and signature)	Manfred Schmolke	
Approved by (printed name and signature)	Erich Thurner	
Date of issue	2005-10-26	

Testing Laboratory Name	TÜV Product Service GmbH
Address	Ridlerstr. 65, D-80339 München
Testing location	CBTL
Address	Ridlerstr. 65, D-80339 München

Applicant's Name	Solytech Enterprise Corporation
Address	3F, 18, Wu Chun 7 Rd., Wu Gu Ind. Area, 248 Wu Gu Shiang, Taipei, Taiwan

Test specification

Standard	IEC 60950-1:2001, First Edition
Test procedure	CB –Scheme
Non-standard test method	N

Test Report Form No.	SL-XXXXEPS.DOC
TRF originator	SGS Fimko Ltd
Master TRF	Dated 2001-12

Test item description .....:	Switching Power Supply
Trademark ..... :	**SOLY**
Model and/or type reference ..... :	SL-XXXXEPS (“XXXX” can be 8460, 8500, 8550 and 8600), MS-4600
Manufacturer ..... :	Same as applicant.
Factory (ies) ……..:	See next page
Rating(s) ..... :	I/P: 115/230 Vac, 60/50 Hz, 10/6 A
	O/P: see page 4 for details

Particulars: test item vs. test requirements

Equipment mobility .....:	Build-in
Operating condition.....:	Continuous
Mains supply tolerance (%) .....:	+10%, -10%
Tested for IT power systems .....:	N
IT testing, phase-phase voltage(V) :	N
Class of equipment .....:	Class I
Mass of equipment (kg).....:	Approx. 1.91
Protection against ingress of water ..:	Ordinary

Possible test case verdicts:

- test case does not apply to the test object ..... :	N(.A.)
- test object does meet the requirement..... :	P(ass)
- test object does not meet the requirement..... :	F(ail)

Attachments:

Testing

Date of receipt of test item ..... :	2005-10-05
Date(s) of performance of test ..... :	2005-10-06 to 2005-10-15

General remarks:

”This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IECEE 02”.

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The test results presented in this report relate only to the item(s) tested.

”(see remark #)" refers to a remark appended to the report.

"(see Annex #)" refers to an annex appended to the report.

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

Factory (ies) :

1) Deer Electronics (Dongguan) Co., Ltd. (Factory ID No.: 50076)
ChangShan Tou, Management Area, Qing Xi, Dongguan, Guangdong, People's Republic of China

2) Qxan Xiang Electronic Co.,Ltd. (Factory ID No.: 52537)
FuGang Ind.Section Qingxi Town, 523660, Dong Guan City, Guang Dong, People's Republic of China

General descriptions:

This equipment is switching power supply (built-in type) for use in information technology equipment.

The model SL-XXXXEPS, where “XXXX” can be 8460, 8500, 8550 and 8600 to denote different output rating.

All models of series are similar to model SL-8600EPS except for output rating and model designation.

The model SL-8600EPS is identical to model MS-4600 except for model name.

The output rating for all models are as below:

Model Name	Output Ratings(DC)								
	+3.3V	+5V	+12V1	+12V2	-12V	+5VSB	+5V & +3.3V	+5V & +3.3V & 12V	Total Max Watt
SL-8460EPS	24A	20A	18A	15A	0.5A	2A	120W	445W	460W
SL-8500EPS	24A	22A	18A	18A	0.5A	2A	130W	485W	500W
SL-8550EPS	24A	24A	20A	18A	0.5A	2A	140W	535W	550W
SL-8600EPS	24A	30A	22A	22A	0.5A	2A	150W	585W	600W
MS-4600	24A	30A	22A	22A	0.5A	2A	150W	585W	600W

Unless otherwise specified, all tests were performed on model MS-4600 to represent the other similar models.

Copy of marking plate:

Cl.	Requirement - Test	Result - Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	Components which were found to affect safety aspects comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards. (see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls	No thermal control.	N
1.5.4	Transformers	Transformer used is suitable for their intended application and comply with the relevant requirements of the standard.	P
1.5.5	Interconnecting cables	Interconnection o/p cable to other device is carrying only SELV voltages on energy level below 240VA except +12V on the energy level over 240VA. →Except for the insulation material, there are no further requirements to the o/p interconnection cable.	P
1.5.6	Capacitors in primary circuits .....:	X2 capacitor according to IEC 60384-14: 1993 with 2.5kVdc pulse test. Y2 capacitor according to IEC 60384-14: 1993 with 5.0kVdc pulse test.	P

Cl.	Requirement - Test	Result - Remark	Verdict
1.5.7	Double insulation or reinforced insulation bridged by components	See below.	N
1.5.7.1	General		N
1.5.7.2	Bridging capacitors	No bridging capacitors provided.	N
1.5.7.3	Bridging resistors	No bridging resistor provided.	N
1.5.7.4	Accessible parts	No bridging capacitors and resistors provided.	N
1.5.8	Components in equipment for IT power systems	Equipment was not applied for the IT power system.	N
1.6	Power interface		P
1.6.1	AC power distribution systems	For TN power system only.	P
1.6.2	Input current	Highest load according to 1.2.2.1 for this equipment is the operation with the max. specified DC-load. (see appended table 1.6.2).	P
1.6.3	Voltage limit of hand-held equipment	This equipment is not hand-held equipment.	N
1.6.4	Neutral conductor	Basic insulation for rated voltage between earthed parts and primary phases.	P

Cl.	Requirement - Test	Result - Remark	Verdict
1.7	Marking and instructions		P
1.7.1	Power rating	See below.	P
	Rated voltage(s) or voltage range(s) (V) .....:	115/230 Vac	P
	Symbol for nature of supply, for d.c. only .....:	Mains from AC source	N
	Rated frequency or rated frequency range (Hz) .:	60/50 Hz	P
	Rated current (mA or A) .....:	10/6 A	P
	Manufacturer's name or trademark or identification mark .....:	**SOLY**	P
	Type/model or type reference.....:	SL-XXXXEPS ("XXXX" can be 8460, 8500, 8550 and 8600), MS-4600	P
	Symbol for Class II equipment only .....:	Class I equipment.	N
	Other symbols .....:	Additional symbols or markings that do not give rise to misunderstand.	P
	Certification marks .....:	See marking label for details.	P
1.7.2	Safety instructions	Installation instruction with directions to maintain the requirements of IEC 60950-1 with installation in end system. Included are directions regarding the max. o/p, the max. ambient temperature and that the requirements of the IEC 60950-1 must be observed with the installation in the final system.	P
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N
1.7.4	Supply voltage adjustment ..... :	Voltage setting is use. The voltage rang need to be adjusted by a selector switch. The adjusted voltage is visible on the switch. No instruction is required on the equipment.	P

Cl.	Requirement - Test	Result - Remark	Verdict
1.7.5	Power outlets on the equipment .....:	No such device is use.	N
1.7.6	Fuse identification .....:	Fuse marking printed adjacent to the fuse holder reads as F1 T10A/250V	P
1.7.7	Wiring terminals	See below.	P
1.7.7.1	Protective earthing and bonding terminals .....:	Main earth connection for supply wiring is marked on chassis by symbol 60417-2-IEC-5019. This symbol is not used for other earth connection.	P
1.7.7.2	Terminal for a.c. mains supply conductors	The appliance inlet is used.	N
1.7.7.3	Terminals for d.c. mains supply conductors	Mains from AC source only.	N
1.7.8	Controls and indicators	See below.	P
1.7.8.1	Identification, location and marking .....:	The marking and indication of the power switch is located on the switch so that indication of function is clear.	P
1.7.8.2	Colours .....:	Green.	P
1.7.8.3	Symbols according to IEC 60417 .....:	The 60417-1-IEC-5007 and 5008 (1 and 0) are marked on or adjacent to the power switch.	P

Cl.	Requirement - Test	Result - Remark	Verdict
1.7.8.4	Markings using figures .....:	No indicators for different positions.	N
1.7.9	Isolation of multiple power sources .....:	Only one supply from mains.	N
1.7.10	IT power distribution systems	Equipment was not applied for IT power system.	N
1.7.11	Thermostats and other regulating devices	No thermostats used.	N
1.7.12	Language .....:	Safety warning text in German. Rating marking in English. User's manual was provided in English language, versions in other languages will be provided when the equipment will be applied for other national certificates.	P
1.7.13	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth for 15 sec. and then again for 15 sec. with the cloth soaked with HEXANE. After this test there was no damage to the label. The marking on the label did not fade. There was neither curling nor lifting of the label edge.	P
1.7.14	Removable parts	Marking is not placed on removable parts.	P
1.7.15	Replaceable batteries	No replaceable batteries.	N
	Language.....:		—
1.7.16	Operator access with a tool.....:	Power supply is for building-in.	N
1.7.17	Equipment for restricted access locations.....:	No restricted access location.	N

Cl.	Requirement - Test	Result - Remark	Verdict
2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	See below.	P
2.1.1.1	Access to energized parts	The accessibility of hazardous or ELV voltages are prevented with the final system. The inspection with test pin and test finger should therefore be conducted with the approval of the end system. Installation instruction requires that the requirements of the IEC 60950-1 must be observed to the installation.	N
	Test by inspection .....:	Ditto.	N
	Test with test finger .....:	Ditto.	N
	Test with test pin .....:	Ditto.	N
	Test with test probe .....:	Ditto.	N
2.1.1.2	Battery compartments .....:		N
2.1.1.3	Access to ELV wiring	No ELV wiring in operator accessible area.	N
	Working voltage (V); minimum distance (mm) through insulation		—
2.1.1.4	Access to hazardous voltage circuit wiring	No hazardous voltage wiring in operator accessible area.	N
2.1.1.5	Energy hazards .....:	Max V, A, VA Test: (see appended table)	P
2.1.1.6	Manual controls	Not applicable for building-in.	N
2.1.1.7	Discharge of capacitors in equipment	No risk of electric shock, see appended table.	P
	Time-constant (s); measured voltage (V).....:	<1s; (see appended table 2.1.1.7)	—

Cl.	Requirement - Test	Result - Remark	Verdict
2.1.2	Protection in service access areas	No maintenance work in operation mode necessary.	N
2.1.3	Protection in restricted access locations	The equipment is not intended to be used in restricted locations.	N
2.2	SELV circuits		P
2.2.1	General requirements	42.4V peak or 60VDC are not exceeded in outputs of power supply under normal operation or single fault condition.	P
2.2.2	Voltages under normal conditions (V) .....:	Each output of power supply is not exceeded 42.4V peak or 60VDC.	P
2.2.3	Voltages under fault conditions (V).....:	Single fault did not cause excessive voltage in accessible outputs. Limits of 71V peak and 120V DC were not exceed and SELV limits not for longer than 0.2 seconds.	P
2.2.3.1	Separation by double insulation or reinforced insulation (method 1)	Method 1.	P
2.2.3.2	Separation by earthed screen (method 2)		N
2.2.3.3	Protection by earthing of the SELV circuit (method 3)		N
2.2.4	Connection of SELV circuits to other circuits .....:	No direct connection between SELV and any primary circuits.	N

Cl.	Requirement - Test	Result - Remark	Verdict

2.3	TNV circuits		N
2.3.1	Limits		N
	Type of TNV circuits .....:		—
2.3.2	Separation from other circuits and from accessible parts		N
	Insulation employed.....:		—
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		N
2.4.1	General requirements		N
2.4.2	Limit values		N
	Frequency (Hz).....:		—
	Measured current (mA) .....:		—
	Measured voltage (V) .....:		—
	Measured capacitance (µF).....:		—
2.4.3	Connection of limited current circuits to other circuits		N

Cl.	Requirement - Test	Result - Remark	Verdict
2.5	Limited power sources *Supply from the mains. The testing whether the o/p complies with the requirements of the limited power source should be conducted with the approval of the end system.*		N
	Inherently limited output		N
	Impedance limited output		N
	Overcurrent protective device limited output		N
	Regulating network limited output under normal operating and single fault condition		N
	Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition		N
	Output voltage (V), output current (A), apparent power (VA)..... :		—
	Current rating of overcurrent protective device (A)		—

Cl.	Requirement - Test	Result - Remark	Verdict
2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	Metal enclosure – basic insulated conductive parts touchable in operator area earthed reliably.	P
2.6.2	Functional earthing	Secondary functional earthing is connected to protectively earthed conductive part that separated from primary by basic insulation.	P
2.6.3	Protective earthing and protective bonding conductors	See below.	P
2.6.3.1	General		P
2.6.3.2	Size of protective earthing conductors	Appliance inlet used. Power supply cord is not provided.	N
	Rated current (A), cross-sectional area (mm2), AWG……:		—
2.6.3.3	Size of protective bonding conductors	Protective bonding conductor complies with the minimum conductor size in table 3B; comply with the requirement of 2.6.3.3.	P
	Rated current (A), cross-sectional area (mm2), AWG……:	Rated current 10 A, the length of the cord is not exceed 2m, cross-sectional area: 0.75 mm^2	—
2.6.3.4	Resistance (Ω) of earthing conductors and their terminations, test current (A)…….....:	<0.1Ω (see appended table)	P
2.6.3.5	Colour of insulation……:	Green/ Yellow wire from inlet to chassis. Green/ Yellow wire to chassis reliable fixed with starwasher.	P
2.6.4	Terminals	See below.	P
2.6.4.1	General	The equipment provided with an appliance inlet.	P
2.6.4.2	Protective earthing and bonding terminals	Appliance inlet considered as protective earthing terminal.	P
	Rated current (A), type and nominal thread diameter (mm)……:		—

Cl.	Requirement - Test	Result - Remark	Verdict
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	Protective earthing conductor is in appliance inlet; green/ yellow is provided for protective bonding conductor from appliance inlet to metal chassis.	P
2.6.5	Integrity of protective earthing	See below.	P
2.6.5.1	Interconnection of equipment	This equipment has its own earthing connection. Any other units connected via the interconnecting cable to other unit shall provide SELV only. The class of equipment is class I.	P
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switches or fuses in earthing conductor.	P
2.6.5.3	Disconnection of protective earth	It is not possible to disconnect protective earth without disconnecting mains; an appliance inlet is used as disconnect device.	P
2.6.5.4	Parts that can be removed by an operator	Plug or inlet, earth connected before and disconnected after hazardous voltage. No other operator removable parts.	P
2.6.5.5	Parts removed during servicing	It is not necessary to disconnect earthing except for the removing of the earthed parts itself.	P
2.6.5.6	Corrosion resistance	All safety earthing connections in compliance with Annex J.	P
2.6.5.7	Screws for protective bonding	No self tapping screws are used.	P
2.6.5.8	Reliance on telecommunication network or cable distribution system	No TNV.	N

Cl.	Requirement - Test	Result - Remark	Verdict
2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Equipment relies on 16A rated fuse or circuit breaker of the wall outlet installation protection of the building installation in regard to L to N short circuit. Overcurrent protection is provided by the built-in device fuse.	P
	Instructions when protection relies on building installation	English.	—
2.7.2	Faults not covered in 5.3	The protection devices are well dimensioned and mounted.	P
2.7.3	Short-circuit backup protection	The final system is considered to be pluggable type A, the building installation is considered as providing short circuit protection.	P
2.7.4	Number and location of protective devices .....:	Overcurrent protection by one built-in fuse, earth fault protection by fuse or circuit breaker in the phase of the building installation.	P
2.7.5	Protection by several devices	Only one fuse.	N
2.7.6	Warning to service personnel .....:	With reversible plug of the final system to the mains, hazardous voltage may be still presented in the equipment after the internal fuse opens. However, as it is considered that the plug to the mains will be disconnected during service work, no marking were requested.	P

Cl.	Requirement - Test	Result - Remark	Verdict
2.8	Safety interlocks *No operator accessible areas which presents hazards in the meaning of this standard.*		N
2.8.1	General principles		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	Natural rubber, asbestos or hygroscopic materials are not used.	P
2.9.2	Humidity conditioning	Humidity treatment performed for 120 h.	P
	Humidity (%) ..... :	93% R.H.	—
	Temperature (°C) ..... :	40°C	—
2.9.3	Grade of insulation	Please refer to 5.2, 2.10 and 4.5.1.	P

Cl.	Requirement - Test	Result - Remark	Verdict
2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	See 2.10.3, 2.10.4 and 2.10.5.	P
2.10.2	Determination of working voltage	The rms and the peak voltage were measured on the power supply. The unit was connected to a 240V TN power system and ground was maintained during measurement. Results see appended table 2.10.2.	P
2.10.3	Clearances	See below.	P
2.10.3.1	General		P
2.10.3.2	Clearances in primary circuit	(see appended table 2.10.3 and 2.10.4)	P
2.10.3.3	Clearances in secondary circuits	Compliance with 5.3.4.	N
2.10.3.4	Measurement of transient voltage levels		N
2.10.4	Creepage distances	(see appended table 2.10.3 and 2.10.4)	P
	CTI tests :	The rating for all materials is 400≦CTI<600.	—
2.10.5	Solid insulation	See below.	P
2.10.5.1	Minimum distance through insulation	(see appended table 2.10.5)	P
2.10.5.2	Thin sheet material	The thin sheet materials of polyester tape used in transformers.	P
	Number of layers (pcs) :	3 layers	—
	Electric strength test	3000 V AC applied on any combination of two layers.	—
2.10.5.3	Printed boards	Not applied for.	N
	Distance through insulation		—
	Electric strength test for thin sheet insulating material		—
	Number of layers (pcs) :		—

Cl.	Requirement - Test	Result - Remark	Verdict
2.10.5.4	Wound components	No wound components without interleaved insulation. (see appended table 2.10.5.1 and Annex U)	N
	Number of layers (pcs) :		—
	Two wires in contact inside wound component; angle between 45° and 90° :		—
2.10.6	Coated printed boards	No coated printed wiring boards.	N
2.10.6.1	General		N
2.10.6.2	Sample preparation and preliminary inspection		N
2.10.6.3	Thermal cycling		N
2.10.6.4	Thermal ageing (°C)……..:		N
2.10.6.5	Electric strength test		—
2.10.6.6	Abrasion resistance test		N
	Electric strength test		—
2.10.7	Enclosed and sealed parts……..:	No hermetically sealed components.	N
	Temperature T1=T2 = Tma – Tamb +10K (°C)…...:		—
2.10.8	Spacings filled by insulating compound ……..:	Optocoupler is approved component. Other components not applied for. (see appended table 2.10.5.)	P
	Electric strength test	(see appended table 5.2)	—
2.10.9	Component external terminations	(see appended table 2.10.3 and 2.10.4)	P
2.10.10	Insulation with varying dimensions	Insulation kept homogenous.	N

Cl.	Requirement - Test	Result - Remark	Verdict
3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	All internal wires are UL recognised wiring that is PVC insulated, rated VW-1, min. 80°C, 300V. Internal wiring gauge is suitable for current intended to be carried.	P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks which could damage the insulation and cause hazard.	P
3.1.3	Securing of internal wiring	Internal wires with only basic isolation are routed so that they are not close to any live bare components. The wires are secured by solder pins and quick connect terminals so that a loosening of the terminal connection is unlikely.	P
3.1.4	Insulation of conductors	Securely held on PCB. No hazard. The insulation of the individual conductors is suitable for the application and the working voltage. For the insulation material see 3.1.1.	P
3.1.5	Beads and ceramic insulators	Not used.	N
3.1.6	Screws for electrical contact pressure	No screws electrical connection used.	P
3.1.7	Insulating materials in electrical connections	All current connections are metal to metal.	P
3.1.8	Self-tapping and spaced thread screws	No self-tapping screws are used.	N

Cl.	Requirement - Test	Result - Remark	Verdict
3.1.9	Termination of conductors	Provided with an appliance inlet.	N
	10 N pull test		—
3.1.10	Sleeving on wiring	Sleevings on wiring reliable kept in position by cable ties or by the use of heatshrunk sleeving.	P

3.2	Connection to an a.c. mains supply or a d.c. mains supply		P
3.2.1	Means of connection .....:	Provided with an appliance inlet.	P
3.2.1.1	Connection to an a.c. mains supply	Provided with an appliance inlet.	P
3.2.1.2	Connection to a d.c. mains supply	No connection to a d.c. mains supply.	P
3.2.2	Multiple supply connections	Only one supply connection.	N
3.2.3	Permanently connected equipment	The unit is not permanent connected equipment.	N
	Number of conductors, diameter (mm) of cable and conduits .....:		—
3.2.4	Appliance inlets	The appliance inlet complies with IEC 60320. The power cord can be inserted without difficulties and does not support the unit.	P
3.2.5	Power supply cords	The power cord is not provided with the unit. Evaluation of the clause should be made with final system assembly.	N
3.2.5.1	AC power supply cords		N
	Type.....:		—
	Rated current (A), cross-sectional area (mm^2), AWG..... :		—
3.2.5.2	DC power supply cords		N
3.2.6	Cord anchorages and strain relief	Appliance inlet is used.	N
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—

Cl.	Requirement - Test	Result - Remark	Verdict
3.2.7	Protection against mechanical damage	No parts under this unit likely to damage the power supply cord. No sharp edges.	P
3.2.8	Cord guards	The equipment is neither hand held nor intended to be moved during operation.	N
	D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm)..... :		—
3.2.9	Supply wiring space	The supply wiring space is satisfactory.	P

3.3	Wiring terminals for connection of external conductors *The SPS should be investigated in the final system assembly.*		N
3.3.1	Wiring terminals		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 and nominal thread diameter (mm) .....:		—
3.3.6	Wiring terminals design		N
3.3.7	Grouping of wiring terminals		N
3.3.8	Stranded wire		N

Cl.	Requirement - Test	Result - Remark	Verdict
3.4	Disconnection from the mains supply		P
3.4.1	General requirement	See below.	P
3.4.2	Disconnect devices	The appliance inlet is considered to be the disconnect device.	N
3.4.3	Permanently connected equipment	The unit is not permanently connected equipment.	N
3.4.4	Parts which remain energized	When the disconnect device is disconnected no remaining parts with hazardous voltage in the equipment.	P
3.4.5	Switches in flexible cords	No isolation switch provided.	N
3.4.6	Single-phase equipment and d.c. equipment	The disconnect device disconnects both poles simultaneously	P
3.4.7	Three-phase equipment	Equipment is single phase	N
3.4.8	Switches as disconnect devices	The “ON” and “OFF” positions is marked in accordance with 60417-1-IEC-5007 and 60417-1-IEC 5008.	P
3.4.9	Plugs as disconnect devices	The appliance inlet is considered to be the disconnect device.	N
3.4.10	Interconnected equipment	Interconnection to other device by secondary output cable only.	N
3.4.11	Multiple power sources	Only one supply connection provided.	N

3.5	Interconnection of equipment		P
3.5.1	General requirements	This equipment is not considered for connection to TNV.	N
3.5.2	Types of interconnection circuits .....:	Interconnection circuits of SELV through sec o/p cable. No ELV interconnection circuits.	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection circuits.	N

Cl.	Requirement - Test	Result - Remark	Verdict
4	PHYSICAL REQUIREMENTS		P
4.1	Stability *The switching power supply is build-in type. Stability and mechanical hazards are to be evaluated in the final product.*		N
	Angle of 10°		N
	Test: force (N) ..... :		N
4.2	Mechanical strength *The equipment is build-in type. Compliance has to be evaluates when installed into the final system. Tests of sub-clause 4.2.2 and 4.2.3 were performed and passed.*		P
4.2.1	General	The switching power supply is for building-in. it has to be evaluated in the final product.	N
4.2.2	Steady force test, 10 N	10N applied to internal components.	P
4.2.3	Steady force test, 30 N	30N force applied to metal chassis.	P
4.2.4	Steady force test, 250 N	250 forces applied to metal chassis near the fixing frame of DC Fan which side might be outer enclosure.	P
4.2.5	Impact test	Building-in type.	N
	Fall test	Ditto.	N
	Swing test	Ditto.	N
4.2.6	Drop test	Building-in type.	N
4.2.7	Stress relief test	Enclosure is metal.	N
4.2.8	Cathode ray tubes	No cathode ray tube.	N
	Picture tube separately certified .....:		—
4.2.9	High pressure lamps	No high pressure lamp.	N
4.2.10	Wall or ceiling mounted equipment; force (N) ....:		N

Cl.	Requirement - Test	Result - Remark	Verdict
4.3	Design and construction		P
4.3.1	Edges and corners	The switch power supply is for building-in, it has to be evaluated in the final product.	N
4.3.2	Handles and manual controls; force (N)..... :	30N on power switch.	P
4.3.3	Adjustable controls	No control devices.	N
4.3.4	Securing of parts	Electrical and mechanical connections can be expected to with standard usual mechanical stress. For the protection, solder pins, cable ties and heatshrunk tubing are used.	P
4.3.5	Connection of plugs and sockets	No interchangeable plugs or sockets.	N
4.3.6	Direct plug-in equipment	The equipment is not a direct plug-in unit.	N
	Dimensions (mm) of mains plug for direct plug-in .....:		—
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N).....:		—
4.3.7	Heating elements in earthed equipment	No heating elements.	N
4.3.8	Batteries		N
4.3.9	Oil and grease	No oil or grease.	N
4.3.10	Dust, powders, liquids and gases	Equipment in intended use not considered to be exposed to these.	N
4.3.11	Containers for liquids or gases	The equipment does not contain liquid.	N
4.3.12	Flammable liquids..... :	No flammable liquids in this unit.	N
	Quantity of liquid (l)..... :		—
	Flash point (°C)..... :		—

Cl.	Requirement - Test	Result - Remark	Verdict
4.3.13	Radiation; type of radiation ..... :	No ionising radiation, laser or flammable gases presents.	N
4.3.13.1	General		N
4.3.13.2	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		N
4.3.13.4	Human exposure to ultraviolet (UV) radiation .... :		N
	Part, property, retention after test, flammability classification ..... :		N
4.3.13.5	Laser (including LEDs)		N
	Laser class ..... :		—
4.3.13.6	Other types ..... :		N

4.4	Protection against hazardous moving parts		N
4.4.1	General	No moving parts.	N
4.4.2	Protection in operator access areas	No moving parts.	N
4.4.3	Protection in restricted access locations	The equipment is not intended to be used in restricted locations.	N
4.4.4	Protection in service access areas	No moving parts.	N

4.5	Thermal requirements		P
4.5.1	Maximum temperatures	(see appended table 4.5.1).	P
	Normal load condition per Annex L .....:	Maximum normal load which specified by manufacturer.	P
4.5.2	Resistance to abnormal heat	(see appended table 4.5.2).	P

Cl.	Requirement - Test	Result - Remark	Verdict
4.6	Openings in enclosures *The equipment is a build-in type. Compliance shall be evaluates for the final system.*		P
4.6.1	Top and side openings	Not applicable for building-in component.	N
	Dimensions (mm) .....:		—
4.6.2	Bottoms of fire enclosures	With having the following components: ■ components with windings ■ wiring ■ semiconductor devices, transistors, diodes, integrated circuits ■ resistors, capacitors, inductors The fire enclosure is required. However, with this unit as a building-in component, the meeting of the requirements are to be observed with the approval of the end system.	P
	Construction of the bottom .....:		—
4.6.3	Doors or covers in fire enclosures	No door or cover.	N
4.6.4	Openings in transportable equipment		N
4.6.5	Adhesives for constructional purposes	No barrier or screen secured with adhesive.	N
	Conditioning temperature (°C)/time (weeks) .....:		—

4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Use of materials with the required flammability classes.	P
	Method 1, selection and application of components wiring and materials	Selection and application of components and materials which minimize the possibility of ignition and spread of flame.	P
	Method 2, application of all of simulated fault condition tests	Application of the simulated fault tests in 5.3.6.	P

Cl.	Requirement - Test	Result - Remark	Verdict
4.7.2	Conditions for a fire enclosure	See below.	P
4.7.2.1	Parts requiring a fire enclosure	With having the following components: ■ components with windings ■ wiring ■ semiconductor devices, transistors, diodes, integrated circuits ■ resistors, capacitors, inductors The fire enclosure is required. However, with this unit as a building-in type, the meeting of the requirements are to be observed with the approval of the end system.	P
4.7.2.2	Parts not requiring a fire enclosure	See 4.7.2.1	N
4.7.3	Materials		P
4.7.3.1	General	Integrated circuits and small electrical parts mounted on a printed wiring board min. rated V-1 or better.	P
4.7.3.2	Materials for fire enclosures	Enclosure is metal. This equipment is for build-in, compliance shall be evaluated in the final product.	N
4.7.3.3	Materials for components and other parts outside fire enclosures	No components or parts outside fire enclosures.	N
4.7.3.4	Materials for components and other parts inside fire enclosures	Internal components except small parts are V-2, HF-2 or better. Integrated circuits and small electrical parts mounted on a printed wiring board min. rated V-1.	P
4.7.3.5	Materials for air filter assemblies	No air filters assemblies.	N
4.7.3.6	Materials used in high-voltage components	No high voltage component used.	N

Cl.	Requirement - Test	Result - Remark	Verdict
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General	See sub-clause 5.1.2 to 5.1.6.	P
5.1.2	Equipment under test (EUT)	EUT has only one mains connection.	P
5.1.3	Test circuit	Equipment is tested using the test circuit in figure 5A.	P
5.1.4	Application of measuring instrument	Tests are conducted using one of the measuring instruments in annex D, or any other circuit giving the same results.	P
5.1.5	Test procedure	The touch current was measured from earth to conductive parts.	P
5.1.6	Test measurements	(see appended table 5.1)	P
	Test voltage (V)		—
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
	Measured protective conductor current (mA)		—
	Max. allowed protective conductor current (mA)		—
5.1.7	Equipment with touch current exceeding 3.5 mA ...	Touch current does not exceed 3.5mA.	N
5.1.8	Touch currents to and from telecommunication networks and cable distribution systems and from telecommunication networks		N
5.1.8.1	Limitation of the touch current to a telecommunication network and a cable distribution system		N
	Test voltage (V)		—
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
5.1.8.2	Summation of touch currents from telecommunication networks		N

Cl.	Requirement - Test	Result - Remark	Verdict
5.2	Electric strength		P
5.2.1	General	All tests voltages were applied for 1minute in the chamber after the humidity test of 2.9.2 and in warm conditions after the heating test of 4.5.1 No isolation breakdown was observed (results see appended tables).	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	Output overload test: The most unfavourable load test. Result see appended table. Blocked opening and stalled fan test: results see appended table. After test the electric strength test was conducted. No isolation break down was noted.	P
5.3.2	Motors	The cooling fan with the locked rotor, this protection turns in cycling mode in which the temp. is kept below the temp. under normal conditions.	P
5.3.3	Transformers	No high temp. of the transformer are to be observed or to be expected. (see appended table 5.3 and Annex C). (see appended table)	P
5.3.4	Functional insulation.....:	Short Circuit tests. Result see appended table 5.3.	P

Cl.	Requirement - Test	Result - Remark	Verdict
5.3.5	Electromechanical components	No electromechanical components.	N
5.3.6	Simulation of faults	The power supply is protected by the following means: ■ Overcurrent fuse F1 ■ OPP protection by U4, PH2, Q15, U1, Q12, Q13. Results see appended table 5.3.	P
5.3.7	Unattended equipment	None of them are used.	N
5.3.8	Compliance criteria for abnormal operating and fault conditions	No fire propagated beyond the equipment. No molten metal was emitted. Electric strength test primary→SELV and primary→ground were passed.	P

Cl.	Requirement - Test	Result - Remark	Verdict
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		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
	Test voltage (V) ..... :		—
	Current in the test circuit (mA) ..... :		—
6.1.2.2	Exclusions ..... :		N
6.2	Protection of equipment users from overvoltages on telecommunication networks		N
6.2.1	Separation requirements		N
6.2.2	Electric strength test procedure		N
6.2.2.1	Impulse test		N
6.2.2.2	Steady-state test		N
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 .....:		—

Cl.	Requirement - Test	Result - Remark	Verdict
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N
7.1	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N
7.2	Protection of equipment users from overvoltages on the cable distribution system		N
7.3	Insulation between primary circuits and cable distribution systems		N
7.3.1	General		N
7.3.2	Voltage surge test		N
7.3.3	Impulse test		N

Cl.	Requirement - Test	Result - Remark	Verdict
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)		N
A.1.1	Samples.....:		—
	Wall thickness (mm).....:		—
A.1.2	Conditioning of samples; temperature (°C) .....:		N
A.1.3	Mounting of samples .....:		N
A.1.4	Test flame		N
A.1.5	Test procedure		N
A.1.6	Compliance criteria		N
	Sample 1 burning time (s) .....:		—
	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.....:		—
	Wall thickness (mm).....:		—
A.2.2	Conditioning of samples		N
A.2.3	Mounting of samples		N
A.2.4	Test flame		N
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 60695-2-2, cl. 4, 8		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

Cl.	Requirement - Test	Result - Remark	Verdict
B	Annex B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		P
B.1	General requirements		N
	Position .....:		—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
B.2	Test conditions		N
B.3	Maximum temperatures		N
B.4	Running overload test		N
B.5	Locked-rotor overload test	See appended table 5.3	P
	Test duration (days) .....:		—
	Electric strength test: test voltage (V) .....:		—
B.6	Running overload test for d.c. motors in secondary circuits		N
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N
B.7.1	Test procedure		N
B.7.2	Alternative test procedure; test time (h) .....:		N
B.7.3	Electric strength test		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) .....:		—

Cl.	Requirement - Test	Result - Remark	Verdict

C	Annex C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position .....:	(see appended table 1.5.1)	—
	Manufacturer .....:	(see appended table 1.5.1)	—
	Type .....:	(see appended table 1.5.1)	—
	Rated values .....:	(see appended table 1.5.1)	—
	Method of protection.....:		—
C.1	Overload test	(see appended table 5.3)	P
C.2	Insulation	(see appended table 5.2)	P
	Protection from displacement of windings.....:		P

Cl.	Requirement - Test	Result - Remark	Verdict

C.2	Safety isolation transformer		P
	Construction details:		
Transformer T1			
Mfr.: Lively Electronics Factory Co., Ltd.			
Type: ERL-39-600EPS			
Recurring peak voltage		500V	
Required clearance insulation (from table 2H and 2J, pollution degree 2)			
for Reinforced		4.0mm + 0.4mm	
for Basic		2.0mm + 0.2mm	
Effective voltage rms		229V	
Required creepage insulation (from table 2L, pollution degree 2, material group IIIa+IIIb)			
for Reinforced		5.0mm	
for Basic		2.5mm	
Measured min. clearances			
prim-sec (Reinforced)		6.0mm	
pri-core (Basic)		3.0mm	
sec-core (Basic)		3.0mm	
Measured min. creepages			
prim-sec (Reinforced)		6.0mm	
pri-core (Basic)		3.0mm	
sec-core (Basic)		3.0mm	

Cl.	Requirement - Test	Result - Remark	Verdict

Construction:	
Concentric windings on ERL-39 type core, three layers insulation between primary and secondary winding. The distance tape is 3mm top side and 3mm bottom side of transformer. Tubing on end of winding (primary and secondary) to outer pin is above and more than each distance tape of bottom side. Winding ends additionally fixed with tape, outer winding is primary.	
Pin numbers	
Prim.	1-3-7
Sec.	8,9,10-12,13 14-11
Bobbin	
Material	CHANG CHUN, PHENOLIC, type T375J
Thickness	Min. 0.75mm
Electric strength test	
With AC 3000V after humidity treatment	
Result	Pass

Cl.	Requirement - Test	Result - Remark	Verdict

C.2	Safety isolation transformer		P
	Construction details:		
Transformer T3			
Mfr.: Lively Electronics Factory Co., Ltd.			
Type: EEL-19-600EPS			
Recurring peak voltage		580V	
Required clearance insulation (from table 2H and 2J, pollution degree 2)			
for Reinforced		4.0 + 0.6mm	
for Basic		2.0 + 0.3mm	
Effective voltage rms		337V	
Required creepage insulation (from table 2L, pollution degree 2, material group IIIa+IIIb)			
for Reinforced		7.0mm	
for Basic		3.5mm	
Measured min. clearances			
prim-sec (Reinforced)		≥7.2mm	
pri-core (Basic)		≥3.6mm	
sec-core (Basic)		≥3.6mm	
Measured min. creepages			
prim-sec (Reinforced)		≥7.2mm	
pri-core (Basic)		≥3.6mm	
sec-core (Basic)		≥3.6mm	

Cl.	Requirement - Test	Result - Remark	Verdict

Construction:	
Concentric windings on EEL-19 core, three layers insulation between primary and secondary winding. The distance tape is 3.6mm top side and 6.0mm bottom side of transformer. Tubing on end of winding (primary and secondary) to outer pin is above and more than each distance tape of and bottom side. Winding ends additionally fixed with tape, outer winding is primary.	
Pin numbers	
Prim.	7-10, 5-6
Sec.	3-4
Bobbin	
Material	SUMITOMO, PHENOLICS, type PM-9820
Thickness	Min. 0.7mm
Electric strength test	
With AC 3000V after humidity treatment	
Result	Pass

Cl.	Requirement - Test	Result - Remark	Verdict

D	Annex D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS		P
D.1	Measuring instrument	Figure D.1 used.	P
D.2	Alternative measuring instrument		N

E	Annex E, TEMPERATURE RISE OF A WINDING	N

F	Annex F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10)	P

Cl.	Requirement - Test	Result - Remark	Verdict

G	Annex G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1	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	DC mains supply		N
G.3	Determination of telecommunication network transient voltage (V) .....:		N
G.4	Determination of required withstand voltage (V) .:		N
G.5	Measurement of transient levels (V).....:		N
G.6	Determination of minimum clearances.....:		N

Cl.	Requirement - Test	Result - Remark	Verdict

H	Annex H, IONIZING RADIATION (see 4.3.13)	N

J	Annex J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		P
	Metal used .....:		—

K	Annex K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		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 4.5.1)		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
L.7	Other business equipment		N

Cl.	Requirement - Test	Result - Remark	Verdict

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

Cl.	Requirement - Test	Result - Remark	Verdict

N	Annex N, IMPULSE TEST GENERATORS (see 2.10.3.4, 6.2.2.1, 7.3.2 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, BIBLIOGRAPHY	N

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)		N
R.2	Reduced clearances (see 2.10.3)		N

Cl.	Requirement - Test	Result - Remark	Verdict

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)		NW
			N

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
AC Inlet	Chao Hui	CH411	10A, 250Vac, 65°C	IEC/EN 60320-1	VDE
	Rich Bay	R-301, R-301 SN	10A, 250Vac, 65°C	IEC/EN 60320-1	VDE
	Shenzhen Rocke	RB-9B	10A, 250Vac, 65°C	IEC/EN 60320-1	VDE
	Sun Fair	S-03	10A, 250Vac, 65°C	IEC/EN 60320-1	VDE
	TECX	TU-301-A	10A, 250Vac, 65°C	IEC/EN 60320-1	VDE
	Zhang Jia Gang Hua Feng	HF-301	10A, 250Vac, 65°C	IEC/EN 60320-1	VDE
Power Switch	Ningbo Yinxian Lihe	RL3	10A, 250V	VDE 0630	VDE
	Ningbo Yinxian Lihe	RL3-4	10A, 250V	VDE 0630	VDE
	Solteam	OR-2	6A, 250V 10A,125V	VDE 0630	VDE
	Zhang Jia Gang Hua Feng	HF-606xx	6A, 250V 10A,125V	VDE 0630	VDE
Chassis	--	--	Metal. min. 0.6mm thick	--	--
PCB	--	--	V-1 or better 130°C	UL 94	UL
Insulation Sheet	--	--	V-2, 0.4mm thick	UL 94	UL
DC Fan on side	GLOBEFAN	RL48S0802512H	12Vdc, 0.31A, 43.78CFM	EN 60950-1	UL, TUV
DC Fan on top	GLOBEFAN	RL48S0802512H	12Vdc, 0.31A, 43.78CFM	EN 60950-1	UL, TUV
For EMI Board (optional)					
- X-Capacitor (CCX1) (optional)	Carli	MPX	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continue)				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
	Cheng Tung	CTX	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Dain	MPX	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Hua Jung	MKP	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Iskra	KNB1530	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Jenn Fu	MPX	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Matsushita	ECQUG	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Rifa	PHE 830…	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Shenzhen Jing Yu	CBBX2	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	TENTA	MEX	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	UTX	HQX	Max. 1.0µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
- Y-Cap. (CCY1, CCY2) (Optional)	Jya-Nay	JN	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	FI
	Jya-Nay	JY	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	FI
	Matsushita	ECQ-UV, NS-A, RS	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	FI
	Matsushita	TS	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	FI
	Matsushita	ECQ-UT, ECQ-UY	Max. 4700pF, 250Vac, 100°C	IEC 60384-14/1993	FI
	Matsushita	ECQ-JY	Max. 3300pF, 250Vac, 100°C	IEC 60384-14/1993	FI
	Netron Tech	AA, AD	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	FI

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continue)				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
	Samwha	SD, SC	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Success	SF	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	FI
	Success	SB	Max. 2200pF, 250Vac, 125°C	IEC 60384-14/1993	FI
	Success	SE	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	VDE
	TDK	CD, CS	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Yinan Don's	CT81	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Hsuan Tai	CY	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
- Bleeder Resistor (CR1) (Optional)	PILKOR	MSR37	960K ohm, 1/2W minimum	EN 60065	VDE
- Choke (CLF1) (optional)	JIA SHENG	T22*14*8	130°C	--	--
- Choke (CL1) (optional)	LIVELY	T130-127	130°C	--	--
For Main Board					
- Fuse (F1)	WALTER	TMD	T10A, 250Vac	EN 60127-2	VDE
- X-Capacitor (CX1, CX2) (optional)	Carli	MPX	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Cheng Tung	CTX	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Dain	MPX	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Hua Jung	MKP	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Iskra	KNB1530	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Jenn Fu	MPX	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continue)				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
	Hua Jung	MKP	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Matsushita	ECQUG	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Rifa	PHE 830…	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	Shenzhen Jing Yu	CBBX2	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	VDE
	UTX	HQX	Max. 0.33µF, 275Vac, 100°C	IEC 60384-14/1993	FI
- Bleeder Resistor (R80, R91) (optional)	--	--	510KΩ, 1/4W min.	--	--
- Varistor (Z1)	Centra	CNR-10D471K	300Vac, 385Vdc	--	UL
	Joyin	JVR10N471K	300Vac, 385Vdc	--	UL
	JYA-NAY	JNR-10D471K	300Vac, 385Vdc	--	UL
	Pan Overseas	PVR-10D471K	300Vac, 385Vdc	--	UL
	Success	SVR-10D471K	300Vac, 385Vdc	--	UL
	Thinking	TVR10D471K	300Vac, 385Vdc	--	UL
	Uppermost	V10K300	300Vac, 385Vdc	--	UL
- Bridge Diode (BD1)	--	--	600V, 10A min.	--	--
- Y-Cap. (CY1) (Optional)	Jya-Nay	JN	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	VDE
	Jya-Nay	JY	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Matsushita	ECQ-UV, NS-A, RS	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	FI
	Matsushita	TS	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	FI
	Matsushita	ECQ-UT, ECQ-UY	Max. 4700pF, 250Vac, 100°C	IEC 60384-14/1993	FI

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continue)				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
	Matsushita	ECQ-JY	Max. 3300pF, 250Vac, 100°C	IEC 60384-14/1993	FI
	Netron Tech	AA, AD	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Samwha	SD, SC	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Success	SF	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	FI
	Success	SB	Max. 2200pF, 250Vac, 125°C	IEC 60384-14/1993	FI
	Success	SE	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	VDE
	TDK	CD, CS	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Yinan Don's	CT81	Max. 4700pF, 250Vac, 85°C	IEC 60384-14/1993	VDE
	Hsuan Tai	CY	Max. 4700pF, 250Vac, 125°C	IEC 60384-14/1993	VDE
- Optical Isolator (PH1, PH2, PH3,)	COSMO	KPC817 KP1010	Distance through insulation =0.5mm, internal =5.3mm, External =8.0mm	VDE 0884 IEC 60950	VDE
	Everlight	EL817	Distance through insulation =0.5mm, internal =6.0mm, External =7.7mm	VDE 0884 IEC 60950	VDE
	Fairchild	H11A817X	Distance through insulation >1.0mm, External>7.0mm	VDE 0884 IEC 60950	VDE
	Lite-On	LTV817...	Distance through insulation =0.8mm, internal =5.2mm, External =7.8mm	VDE 0884 IEC 60950	VDE

Cl.	Requirement - Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continue)				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
	Sharp	PC 817	Distance through insulation =0.5mm, internal =4.4mm, External =7.7mm	VDE 0884 IEC 60950	VDE
- Ripple Cap. (C2)	--	--	330µF, 400V.,105 °C	--	--
- Choke (L1) (optional)	LIVELY	T25*15*12	130°C		
- Choke (F2)	LIVELY	T157-121	130°C		
- Thermistor (RT1)	--	--	12A, 5Ω at 25 °C		
- Transformer (T1)	LIVELY	ERL-39-600EPS	Class A	--	--
- Transformer (T2)	LIVELY	EE-13-600EPS	Class A	--	--
- Transformer (T3)	LIVELY	EEL-19-600EPS	Class A	--	--
- Transistor (Q1, Q2, Q3, Q4)	--	--	500V, 24A min.	--	--
- Transistor (Q5)	--	--	650V, 2A min.	--	--
- Insulation Sheet (for PWB and Metal Chassis)	Various	Various	V-2 or better, 0.4mm minimum thickness.	--	UL 94
- Insulation Sheet (Primary and Secondary components)	Various	Various	V-2 or better, 0.2mm thickness.	--	UL 94
[1]) an asterisk indicates a mark which assures the agreed level of surveillance					

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
Condition A						
F1	--	103V/50Hz	833	8140	8140	Maximum Normal load
F1	--	103V/60Hz	833	8150	8150	Maximum Normal load
F1	10	115V/50Hz	819	7180	7180	Maximum Normal load
F1	10	115V/60Hz	819	7180	7180	Maximum Normal load
F1	--	122V/50Hz	813	6730	6730	Maximum Normal load
F1	--	122V/60Hz	813	6740	6740	Maximum Normal load
F1	--	207V/50Hz	780	3850	3850	Maximum Normal load
F1	--	207V/60Hz	780	3870	3870	Maximum Normal load
F1	6	230V/50Hz	778	3470	3470	Maximum Normal load
F1	6	230V60Hz	778	3490	3490	Maximum Normal load
F1	--	253V/50Hz	774	3170	3170	Maximum Normal load
F1	--	253V/60Hz	774	3170	3170	Maximum Normal load
Condition B						
F1	--	103V/50Hz	819	8050	8050	Maximum Normal load
F1	--	103V/60Hz	819	8060	8060	Maximum Normal load
F1	10	115V/50Hz	812	7110	7110	Maximum Normal load
F1	10	115V/60Hz	812	7110	7110	Maximum Normal load
F1	--	122V/50Hz	806	6650	6650	Maximum Normal load
F1	--	122V/60Hz	806	6660	6660	Maximum Normal load
F1	--	207V/50Hz	775	3820	3820	Maximum Normal load
F1	--	207V/60Hz	775	3830	3830	Maximum Normal load
F1	6	230V/50Hz	772	3440	3440	Maximum Normal load
F1	6	230V60Hz	772	3460	3460	Maximum Normal load
F1	--	253V/50Hz	768	3140	3140	Maximum Normal load
F1	--	253V/60Hz	768	3160	3160	Maximum Normal load

Cl.	Requirement - Test	Result - Remark	Verdict

1.6.2	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
Condition C						
F1	--	103V/50Hz	813	7940	7940	Maximum Normal load
F1	--	103V/60Hz	813	7950	7950	Maximum Normal load
F1	10	115V/50Hz	800	7030	7030	Maximum Normal load
F1	10	115V/60Hz	800	7030	7030	Maximum Normal load
F1	--	122V/50Hz	793	6570	6570	Maximum Normal load
F1	--	122V/60Hz	793	6580	6580	Maximum Normal load
F1	--	207V/50Hz	766	3780	3780	Maximum Normal load
F1	--	207V/60Hz	766	3790	3790	Maximum Normal load
F1	6	230V/50Hz	763	3410	3410	Maximum Normal load
F1	6	230V60Hz	763	3420	3420	Maximum Normal load
F1	--	253V/50Hz	760	3110	3110	Maximum Normal load
F1	--	253V/60Hz	760	3130	3130	Maximum Normal load
Note: Condition A for 3.3V/24A, 5V/14.16A, 12V/18.1A, 12V/18.1A, -12V/0.5A, +5Vsb/2A Condition B for 3.3V/15A, 5V/20.1A, 12V/18.1A, 12V/18.1A, -12V/0.5A, +5Vsb/2A Condition C for 3.3V/12A, 5V/12.88A, 12V/20A, 12V/20A, -12V/0.5A, +5Vsb/2A						

Cl.	Requirement - Test	Result - Remark	Verdict

2.1.1.5	TABLE: energy hazard					P
ITEM	VOLTAGE (RATED)	CURRENT (RATED)	VOLTAGE (MAX.)	CURRENT (MAX.)	V.A. (W) (MAX.)	COMMENTS
1	3.3V	24	3.5	27.5	80.3	
2	5V	30	5.145	32.9	148.1	
3	12V1	22	12.09	21.5	230.2	
4	12V2	22	12.09	21.5	230.2	
5	5Vsb	0.5	5.04	3.42	12.6	
6	-12V	2	12.06	1.5	16.65	
Input voltage: 230Vac, 60Hz						
Note: Energy does not exceed 240VA between any two points in accessible parts (O/P) connector of secondary circuit.						

2.1.1.7	TABLE: discharge test			P
Condition	Switch Position	τ calculated (s)	τ measured (s)	comments
Appliance Inlet L-N (Fuse in)	--	0.56	0.22	Vo= 360 V 37% x Vo= 134 V $V_{t=1sec}$= 32 V
Appliance Inlet L-N (Fuse out)	--	0.96	0.84	Vo= 354 V 37% x Vo= 124 V $V_{t=1sec}$= 108 V
EMI filter : with EMI board				
Overall capacity: 1.0uF=CCX1(EMI board), 0.33Uf=CX1 (Main board)				
Discharge resistor: 960kΩ (960kΩ=CR1) (EMI board), 1020kΩ (1020kΩ= 510+510= R91+R80) (Main board)				

Cl.	Requirement - Test	Result - Remark	Verdict

2.2.2	TABLE: Hazardous voltage (circuit) Measurement Test			
Transformer designation	Location	Maximum Voltage	Voltage Limiting Component	Comments
T1	Pin 8, 9, 10 – Pin 12, 13	38Vpk		
T1	Pin 11 – Pin 12, 13	38Vpk		
T1	Pin 14 – Pin 12, 13	62Vpk	--	--
T1	Pin 14 – Pin 12, 13	62Vpk	D10	--
T1	Pin 14 – Pin 12, 13	8Vpk	CL1	Service for +12Vdc and -12Vdc output, refer to table 2.3.2, 2.3.3 for SELV Reliability Test
T3	Pin 3 – Pin 4	42.4Vpk		--
T3	Pin 3 – Pin 4	11.2Vpk	D7	Service for +12Vdc and -12Vdc output, refer to table 2.3.2, 2.3.3 for SELV Reliability Test

2.2.2, 2.2.3, 2.2.4	TABLE: SELV Reliability Test					P
Accessible Part (From to)	Voltage Limiting Component	Fault	Maxium Vpk/dc	Duration (ms)	result	
Output (+12V to -)	CL1	Short	0Vdc	--	Unit shut down, fuse current=0.2A.	
Output (-12V to -)	D7	Short	0Vdc	--	Unit shut down, fuse current=0.2A.	
After the fault introduction, the voltage did not exceed 42.4 V pk or 60 V dc for longer than 0.2 seconds. In addition, a limit of 71 V pk or 120 V dc was not exceeded.						

Cl.	Requirement - Test	Result - Remark	Verdict

2.6.3.3	TABLE: ground continue test		P
Location		Resistant measured (Ω)	Comments
From earth pin to Metal Chassis		0.008	Test current=25A, 1min
From earth pin to Metal Chassis		0.009	Test current=40A, 2min
Test current=25A/40A			

Cl.	Requirement - Test	Result - Remark	Verdict

2.10.2	Table: working voltage measurement		P
Location	Peak Voltage (V)	RMS Voltage (V)	Comments [1])
T1 Pin 1 to pin 8, 9, 10	480	**229**	*
T1 Pin 1 to pin 11	488	211	
T1 Pin 1 to pin 12, 13	**500**	214	*
T1 Pin 1 to pin 14	490	192	
T1 Pin 5 to pin 8, 9, 10	400	177	
T1 Pin 5 to pin 11	410	180	
T1 Pin 5 to pin 12, 13	380	178	
T1 Pin 5 to pin 14	430	182	
T1 Pin 7 to pin 8, 9, 10	480	220	
T1 Pin 7 to pin 11	470	215	
T1 Pin 7 to pin 12, 13	490	211	
T1 Pin 7 to pin 14	480	228	
T3 Pin 3 to pin 5	470	179	
T3 Pin 3 to pin 6	390	178	
T3 Pin 3 to pin 7	**580**	332	*
T3 Pin 3 to pin 10	460	304	
T3 Pin 4 to pin 5	512	181	
T3 Pin 4 to pin 6	380	177	
T3 Pin 4 to pin 7	**580**	**337**	*
T3 Pin 4 to pin 10	450	305	
PH3 Pin1 to pin 3	380	178	
PH3 Pin1 to pin 4	380	175	
PH3 Pin2 to pin 3	390	178	
PH3 Pin2 to pin 4	380	175	
PH2 Pin1 to pin 3	380	175	
PH2 Pin1 to Pin 4	380	171	
PH2 Pin2 to Pin 3	380	175	

Cl.	Requirement - Test	Result - Remark	Verdict

Location	Peak Voltage (V)	RMS Voltage (V)	Comments [1])
PH2 Pin 2 to pin 4	370	171	
PH1 Pin 1 to pin 3	380	177	
PH1 Pin 1 to pin 4	380	174	
PH1 Pin 2 to pin 3	380	176	
PH1 Pin 2 to pin 4	380	173	
CY1 primary to secondary	380	174	
C50 to R8	350	159	
*[1]) an asterisk indicates the highest measured working voltage.			

Cl.	Requirement - Test	Result - Remark	Verdict

2.10.3 and 2.10.4	TABLE: clearance and creepage distance measurements					P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
primary components(with 10N) → earthed trace or metal chassis or PE heatsink	**<420**	**<250**	**2.0**	↓	**2.5**	↓
Primary heatsink (HS1) to metal chassis				≥4.81		≥4.81
C2 to metal chassis				≥3.39		≥3.39
C5 to metal chassis				≥4.82		≥4.28
R1(on IC Board) to metal chassis				≥7.48		≥7.48
primary traces→earthed trace or metal case	**<420**	**<250**	**2.0**	↓	**2.5**	↓
Under CY1				6.88		6.88
L to PE trace				≥3.57		≥3.57
F2 to metal chassis				10.12		10.12
Primary traces to PE (metal chassis) near R37				≥4.03		≥4.03
primary components (with 10N) →secondary components (with 10N)	**<420**	**<250**	**4.0**	↓	**5.0**	↓
D6 to U2				≥12.08		≥12.08
pri. →sec. traces	**<420**	**<250**	**4.0**	↓	**5.0**	↓
Under PH3				≥6.85		≥6.85
Under PH3				≥6.16		≥6.16
pri. →sec. traces under T1	500	229	4.0+0.4	≥6.58	5.0	≥6.58
pri. →sec. traces under T3	580	337	4.0+0.6	≥7.05	7.0	≥7.05
Between Fuse (F1) two ends (basic insulation)	**<420**	**<250**	**2.0**	≥7.03	**2.5**	≥7.03

Note:

1. The CTI rating of PCB is material group IIIb (Cl. 2.10.4).
2. Separation Method between SELV and hazard circuit (Cl. 2.2.3) by double or reinforced insulation (Method 1).
3. Functional insulation shorted, see Cl. 5.3.4.
4. There is a mylar sheet between under main board primary circuit and metal chassis for basic insulation.
5. Between L1 and BD1 are isolated by Mylar.
6. The primary side of circuit that close to RT1 is isolated to side metal case for basic insulation by mylar (the about area=100mmx43mm)
7. The transformer T2 is not bridge to primary and secondary side that only used for primary component, the insulation distance is not required.

Cl.	Requirement - Test	Result - Remark	Verdict

2.10.5	TABLE: distance through insulation measurements				P
distance through insulation di at/of:		U r.m.s. (V)	test voltage (V)	required di (mm)	di (mm)
Opto-couplers (reinforced insulation for all sources)		230	3000	0.4	>0.4

Cl.	Requirement - Test	Result - Remark	Verdict

4.5	TABLE: maximum temperatures			P
	test voltage (V) .....:	103V/253V		—
	tamb1(°C) .....:	--		—
	tamb2(°C) .....:	--		—
Maximum temperature T of part/at:		T(°C)		AllowedTmax (°C)
1.T1 coil		59.9	58.6	76.7
2.T1 core		56.7	55.3	76.7
3.T3 core		38.5	37.6	76.7
4.T3 coil		39.7	38.6	76.7
5.PH1 body		45.1	42.9	86.7
6.PH2 body		64.8	63.3	86.7
7.PH3 body		35.9	34.3	86.7
8.AC inlet body		47.1	36.0	51.7
9.Power Switch body		41.0	37.5	91.7
10.CCX1 body (for EMI board)		38.5	35.0	71.7
11.CLF1 body (for EMI board)		51.6	37.6	116.7
12.CCY1 body (for EMI board)		59.4	37.1	71.7
13.CCY2 body (for EMI board)		48.6	37.8	71.7
14.CL2 body		61.2	39.2	116.7
15.CX1 body		74.1	50.1	86.7
16.L1 coil		86.8	56.2	116.7
17.CX2 body		66.2	41.2	86.7
18.PWB under BD1		97.9	59.2	116.7
19.F2 coil		59.9	42.4	91.7
20.PWB under RT1		74.0	53.2	116.7
21.CY1 body		41.0	35.0	71.7
22.C2 body		38.8	33.8	91.7
23.PWB under Q1 near Heatsink		70.0	52.7	116.7
24.T2 coil		62.9	61.1	76.7
25.PWB under D9 near Heatsink		71.3	70.4	116.7
26.CL1 coil		36.9	35.9	116.7
27.Ambient		26.9°C	26.7°C	--

Cl.	Requirement - Test	Result - Remark	Verdict

temperature rise T of winding:	R_1 (Ω)	R_2 (Ω)	T (°C)	required Tmax (°C)	insulation class
--	--	--	--	--	--
--	--	--	--	--	--

Comments:

The temperatures were measured by thermal couple (type T) method under worst case normal mode defined in 1.2.2.1and as described in 1.6.2 at voltage described in 1.4.5. The worst case at normal mode is defined with max load of the equipment.

With max. ambient temperature specified as 40°C, therefore, the maximum temperature rise is calculated as follows:

Winding components:

- class A →100 - 10 - (40-26.7) = 76.7°C

Components with:

- max. temp. of 130°C (PCB) → 130-(40-26.7) = 116.7°C
- max. temp. of 130°C (Line choke) → 130-(40-26.7) = 116.7°C
- max. temp. of 85°C (Y capacitor, CY1, CCY1, CCY2) → 85-(40-26.7) = 71.7°C
- max. temp. of 100°C (X capacitor CX1, CCX1, CX2) → 100-(40-26.7) = 86.7°C
- max. temp. of 105°C (Ripple capacitor, C2) → 105-(40-26.7) = 91.7°C
- max. temp. of 65°C (AC Inlet) → 65-(40-26.7) = 51.7°C
- max. temp. of 100°C (Photo coupler) → 100-(40-26.7) = 86.7°C
- when no class of insulation is given, min. insulation 105°C assumed.

Cl.	Requirement - Test	Result - Remark	Verdict

5.1	TABLE: touch current measurement		P
	Normal	**The tests are repeated in reverse polarity**	
Condition	Current (mA) L, N→PE	Current (mA) L, N→PE	Comments
System ON	0.6	0.584	for metal chassis
System OFF	0.23	0.24	for metal chassis
Input voltage: 253V			
Input frequency: 60Hz			
Overall capacity: CY1= CY2=CY3=CCY1=CCY2= 4700pF			

Cl.	Requirement - Test	Result - Remark	Verdict

5.2	TABLE: electric strength measurements		P
test voltage applied between:		test voltage (V)	breakdown
Appliance inlet (L – N) / SELV connector		4242Vdc	No
Appliance inlet (L – N) / Protective Earth		2636Vdc	No
For transformer T1			
Two layers of insulation (Mfr. JINGJIANG, type: PZ)		3000Vac	No
Primary winding to SELV winding		3000Vac	No
Primary winding to Core		1772Vac	No
SELV winding to Core		1772Vac	No
For transformer T3			
Two layers of insulation (Mfr. JINGJIANG, type: PZ)		3000Vac	No
Primary winding to SELV winding		3000Vac	No
Primary winding to Core		1875Vac	No
SELV winding to Core		1875Vac	No
Note: Same results for all sources of insulated transformer.			

Cl.	Requirement - Test	Result - Remark	Verdict

5.3	TABLE: fault condition tests		P
	ambient temperature (°C) .....:	25°C or see below	—
	model/type of power supply .....:	See below	—
	manufacturer of power supply .....:	See page 2	—
	rated markings of power supply .....:	See marking plates	—

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
1.	BD1 (+ to ~)	s-c	240	1 s	F1	0	F1 opened, no hazards.
2.	C2	s-c	240	1 s	F1	0	F1 opened, BD1 damaged, no hazards.
3.	C2	o-c	240	10 min	F1	0.15	BD1 damaged, no hazards.
4.	PH1 pin 1	o-c	240	10 min	F1	0.2	Unit shutdown for except +5Vsb, no hazards.
5.	PH1 pin 1 to pin 2	s-c	240	10 min	F1	0.2	Unit shutdown for except +5Vsb, no hazards.
6.	PH1 pin 3	o-c	240	10 min	F1	0.2	Unit shutdown for except +5Vsb, no hazards.
7.	PH1 pin 3 to pin 4	s-c	240	10 min	F1	0.2	Unit shutdown for except +5Vsb, no hazards.
8.	PH2 pin 1	o-c	240	10 min	F1	3.4	Unit operated normally, the maximum temp, T1 coil = 60°C, T3 coil = 34.7°C, Ambient = 23.5°C, no hazards.
9.	PH2 pin 1 to pin 2	s-c	240	10 min	F1	0.2	Unit shutdown for except +5Vsb, no hazards,
10.	PH2 pin 3	o-c	240	2 hrs	F1	3.4	Unit operated normally, no hazards.
11.	PH2 pin 3 to pin 4	s-c	240	2 hrs	F1	3.4	Unit operated normally, no hazards CT.
12.	PH3 pin 1	o-c	240	2 hrs	F1	3.4	Unit operated normally no hazards, the maximum temp, T1 coil = 60.9°C, T3 coil = 35.4°C, ambient = 24.9°C, no hazards.
13.	PH3 pin 1 to pin 2	s-c	240	2 hrs	F1	3.4	Unit operated normally, no hazards.
14.	PH3 pin 3	o-c	240	2 hrs	F1	3.4	Unit operated normally, no hazards.
15.	PH3 pin 3 to pin 4	s-c	240	10 min	F1	0.15	Unit shutdown, no hazards.

Cl.	Requirement - Test	Result - Remark	Verdict

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
16.	Q5 G to D	s-c	240	--	F1	--	F1 opened, Q5 damaged, no hazards.
17.	Q5 G to S	s-c	240	10 min	F1	0.15	Unit shutdown, no hazards.
18.	Q5 D to S	s-c	240	--	F1	--	F1 opened, Q5 damaged, no hazards.
19.	Q2 D to S	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
20.	Q2 D to G	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
21.	Q2 S to G	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
22.	Q4 D to S	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
23.	Q4 D to G	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
24.	Q4 S to G	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
25.	System Fan	Stalled	240	3 hrs	F1	0.2	Unit shutdown, no hazards, the maximum temp, T1 coil = 101.8°C, T3 coil = 86.2°C, Ambient = 27.0°C.
26.	Power Fan	Stalled	240	4 hrs	F1	0.2	Unit shutdown, no hazards, the maximum temp, T1 coil = 93.0°C, T3 core = 72.8°C, Ambient = 27.6°C.
27.	Ventilation opening	Blocked	240	3.5 hrs	F1	0.2	Unit shutdown, no hazards, the maximum temp, T1 coil = 78.0°C, T3 coil = 73.4°C, Ambient t= 23.4°C.
28.	T1 pin 14 to pin 12 after D10	o-l	240	4 hrs	F1	3.5→0.2	Unit shutdown, no hazards, while output current=1.1A, T1 coil = 85.0°C, T3 coil = 70.5°C, Ambient = 25.1°C.
29.	T1 pin 8 to pin 12 after D9	o-l	240	3.9 hrs	F1	3.5→0.2	unit shutdown, no hazards, while output current=1.7A, T1 coil = 78.0°C, T3 coil = 73.4°C, A mbient = 23.8°C.
30.	T1 pin 8 to pin 12 after D8	o-l	240	3.8 hrs	F1	3.4→0.2	Unit shutdown, no hazards, while output current=1.0A, T1 coil = 75.5°C, T3 coil = 72.8 °C, Ambient = 25.1°C.

Cl.	Requirement - Test	Result - Remark	Verdict

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
31.	T3 pin 3 to pin 4 after D7	o-l	240	3.6 hrs	F1	3.4→0.2	unit shutdown, no hazards, , while output 0.9A, the maximum temp, T1 coil = 74.2°C, T3 coil = 71.5°C, Ambient = 24.7°C.
32.	T1 pin 10 to pin 12	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards,
33.	T1 pin 14 to pin 11	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards,
34.	T1 pin 1 to pin 7	s-c	240	10 min	F1	0.2	unit shutdown except for +5Vsb, no hazards,
35.	T1 pin 1 to pin 5	s-c	240	--	F1	--	F1 damaged, BD1, Q5 damaged, no hazards.
36.	T1 pin 7 to pin 5	s-c	240	--	F1	--	F1 damaged, BD1, Q5 damaged, no hazards.
37.	T3 pin 3 to pin 4	s-c	240	10 min	F1	0.15	Unit shutdown, no hazards.
38.	T3 pin 5 to pin 6	s-c	240	10 min	F1	0.15	Unit shutdown, no hazards.
39.	T3 pin 7 to pin 10	s-c	240	10 min	F1	0.15	Unit shutdown, no hazards.
40.	+12V to Return	o-l	240	4.1 hrs	F1	3.5→0.2	Unit shutdown, while output load = 0.9A, the maximum temp, T1 coil = 93.0°C, T3 coil = 72.8°C, ambient = 27.6 °C, no hazards.
41.	+5V to Return	o-l	240	4.1 hrs	F1	3.4 →0.2	Unit shutdown, while output load = 31.6A, the maximum temp, T1 coil = 73.8°C, T3 coil = 67.5°C, ambient = 24.7 °C, no hazards.
42.	-12V to Return	o-l	240	4 hrs	F1	3.4→0.2	Unit shutdown, while output load = 1A, the maximum temp, T1 coil = 89.7°C, T3 coil = 66.3°C, ambient = 24.9 °C, no hazards.
43.	+3.3V to Return	o-l	240	6 hrs	F1	3.4→0.2	Unit shutdown, while output load = 24.8A, the maximum temp, T1 coil = 74.7°C, T3 coil = 73.6°C, ambient = 23.5 °C, no hazards.

Cl.	Requirement - Test	Result - Remark	Verdict

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
44.	+5Vsb to Return	o-l	240	4 hrs	F1	3.4→0.2	Unit shutdown, while output load = 2.8A, the maximum temp, T1 coil = 78.0°C, T3 coil = 73.4°C, ambient = 23.8 °C, no hazards.
45.	+12V to Return	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
46.	+5V to Return	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
47.	-12V to Return	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
48.	+3.3V to Return	s-c	240	10 min	F1	0.2	Unit shutdown except for +5Vsb, no hazards.
49.	+5Vsb to Return	s-c	240	10 min	F1	0.15	Unit shutdown, no hazards.

supplementary information

Fault: s-c=short-circuited, o-c=open-circuited, o-l=over-loaded

Note:

1. While fuse opened, same results came out for all sources of fuse.

2. While fuse opened, using UL approvaled fuse that have to test for ten times and have the same results.

3. While unit shutdown with some component damaged, same results were carried out for two times.