Test Report issued under the responsibility of:
NCB TÜV SÜD PSB Pte Ltd
1 Science Park Drive, Singapore 118221

TEST REPORT
IEC 61347-2-13
Part 2: Particular requirements:
Section Thirteen – d.c. or a.c. supplied electronic controlgear for LED modules

Report Number. .....:	077-2075616-100
Date of issue .....:	2016-03-28
Total number of pages.....	16 pages
Applicant's name.....:	SOLUM Co., Ltd.
Address .....:	150, Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16674, Republic of Korea
Test specification:	
Standard .....:	IEC 61347-2-13 (First Edition):2006 used in conjunction with IEC 61347-1 (Second Edition):2007+A1:2010+A2:2012
Test procedure .....:	CB Scheme
Non-standard test method……..:	N/A
Test Report Form No.....:	IEC61347_2_13D
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	2013-10

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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

Test item description .....:	LED CONVERTER
Trade Mark .....:	SAMSUNG
Manufacturer.....:	Same as Applicant
Model/Type reference .....:	PSDV180101U, PSDV180101A
Ratings .....:	Input Ratings: 120-277 V a.c., 50/60 Hz, 30 W, Max. 0.5 A, PF=0.9, ta=-25 °C - +60 °C, tc=+85 °C Output Ratings: 20-55 V d.c., 350 mA

Testing procedure and testing location:	
☒ **CB Testing Laboratory:**	TÜV SÜD Korea Laboratory (TKL)
Testing location/ address .....:	#315 and 316, MARIO Tower, 222-12, Guro-dong, Guro-Gu, Seoul, Korea
☐ **Associated CB Laboratory:**	
Testing location/ address .....:	N/A
Tested by (name + signature).....:	James Lee ……
Approved by (+ signature).....:	Martin Kim ……
☐ Testing procedure: TMP	
Testing location/ address .....:	N/A
Tested by (name + signature).....:	N/A
Approved by (+ signature).....:	N/A
☐ Testing procedure: WMT	
Testing location/ address .....:	N/A
Tested by (name + signature).....:	N/A
Witnessed by (+ signature) .....:	N/A
Approved by (+ signature).....:	N/A
☐ Testing procedure: SMT	
Testing location/ address .....:	N/A
Tested by (name + signature).....:	N/A
Approved by (+ signature).....:	N/A
Supervised by (+ signature) .....:	N/A

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

Remark 1: This test report contains a total 16 pages, including appendices (pages 15 to 16) which consist of:

Appendix I: Temperature measurement.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
All tests	As above testing laboratory

Summary of compliance with National Differences:

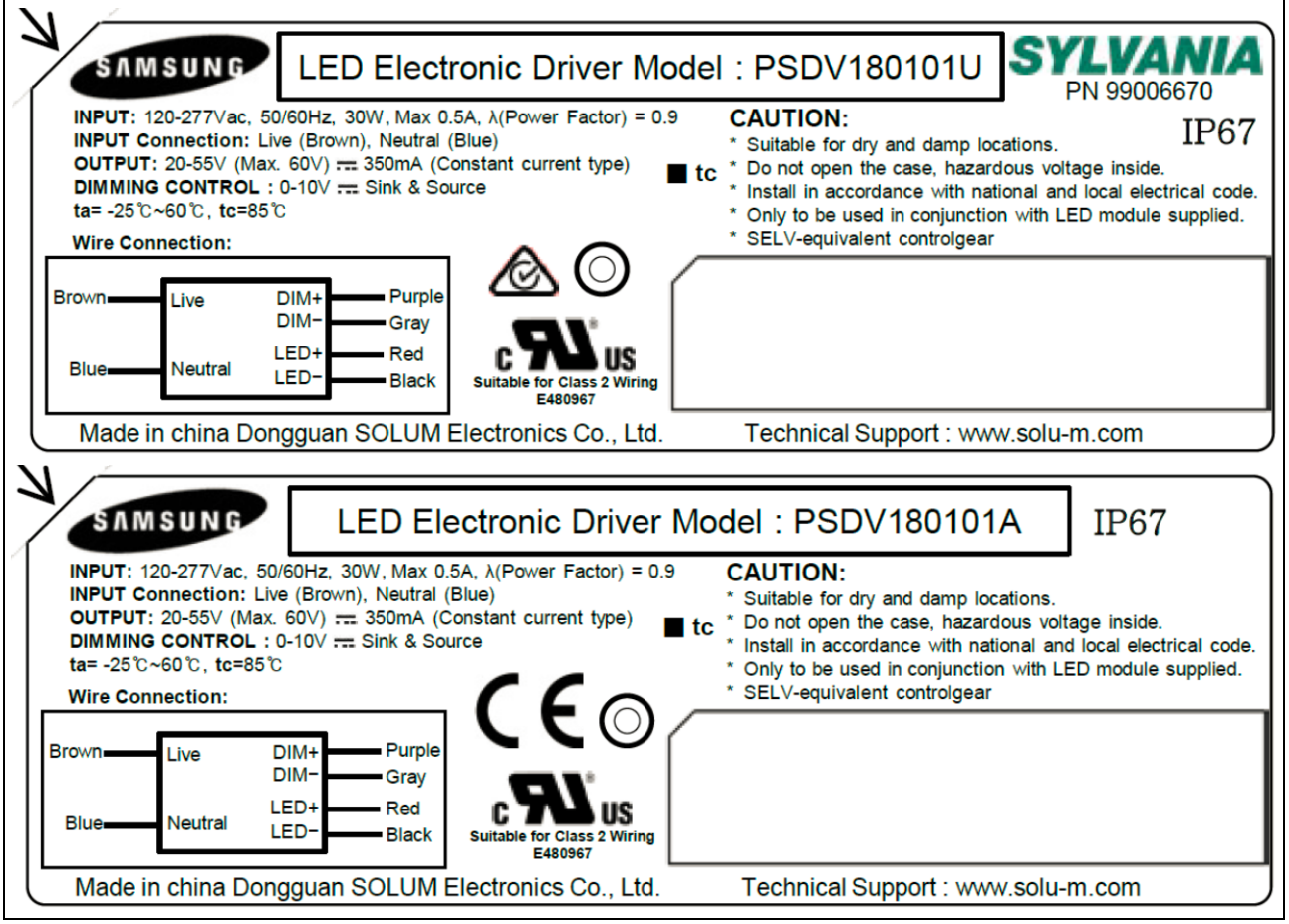
List of countries addressed:

Australia and New Zealand, European group differences and national differences

☒ The product fulfils the requirements of EN 61347-2-13:2006 used in conjunction with EN 61347-1:2008 + A1:2011 + A2:2013

Copy of marking plate

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



Test item particulars ..... :	
Classification of installation and use ..... :	Built-in SELV controlgear
Supply Connection ..... :	Insulated wires
..... :	
..... :	
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)
Testing..... :	
Date of receipt of test item ..... :	2016-03-18
Date (s) of performance of tests..... :	2016-03-22 to 2016-03-24

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Clause numbers between brackets refer to clauses in IEC 61347-1

Remark 1 – History of modification

1. CB Ref. Cert. No. SG-LE-01203 (Test Report Ref. No.: 077-2179215-000).
2. CB Ref. Cert. No. SG-LE-01203M1 (Test Report Ref. No.: 077-2179215-100)
   - Addition of Australia and New Zealand NATIONAL DIFFERENCES.
3. CB Ref. Cert. No. SG-LE-01203M2 (Test Report Ref. No.: 077-2179215-200)
   - The following is changed.

Components	Before	After
Y-cap(CY102)	Not provided	400 V , 3.3 nF

   - Dongguan Solum Electronics Ltd. and Dongguan Yingju Power Co., Ltd. are added.
   - Lug for Ground is added.
   - Some PCB pattern is changed. (it is not affect to safety)
   - AC input wires are added. (see ANNEX 1: components)
   - Correction of typo error. (see ANNEX 1: components)
4. CB Ref. Cert. No. SG-LE-01575 (Test Report Ref. No.: 077-2075616-000)
   - Applicant, manufacturer and factory are added as below;

Before	After
Samsung Electro-Mechanics Co., Ltd. “150, Maeyoung-Ro (Maetan-Dong), Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-743, REPUBLIC OF KOREA”	SOLUM Co., Ltd. 150, Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16674, Republic of Korea

   - Changed of label (see the copy of marking plate)

Remark 2 – This modification report is to supplement the earlier CB Ref. Cert. No. SG-LE-01575. (Test Report Ref. No.: 077-2075616-000)

- The following is changed.

Component	Before	After
Line Filter (LX101)	CV005180SJ	CV004300SJT(HF)

Manufacturer’s Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :

☒ Yes
☐ Not applicable

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

Name and address of factory (ies) ..... :	Factory 1: Same as Applicant. Factory 2: Dongguan Samsung Electro-Mechanics Co., Ltd. Hengkeng Management Area, Liaobu Town, Dongguan City, Guangdong Province 523413 People's Republic of China Factory 3: Dongguan Solytech Enterprise Corporation Hong Men Shan Industrial Area, Chang Shan Tou Management Area, Qing Xi Town, Dong Guan City, Guang Dong Province 523661 People's Republic of China Factory 4: Dong Guan Aptech Electronics Co., Ltd. Jinfu 2 Road, Tangchun East Area, Tangchun Village, Liaobu Town 523407 Dongguan City, Guangdong Province, People's Republic of China Factory 5: Dongguan City Yingju Electronics Co., Ltd. Yewuji Village, Sijia, Shijie Town Dongguan, Guangdong 523300 People's Republic of China Factory 6: Dongguan Towada Electronics Co., Ltd. Fu Da Ind, Zhangyang District, 523636 Zhangmutou, Dongguan, People's Republic of China Factory 7: Dongguan Solum Electronics Co., Ltd. Hengkeng Management Area, Liaobu Town, Dongguan City, Guangdong Province 523413 People's Republic of China Factory 8: Dongguan Yingju Power Co., Ltd. No.6 Yongxing Road, Shayao Village, Shijie Town, Dongguan City, Guangdong Province, 523292, People's Republic of China

General product information:

1. The product was Built-in type LED control gear and prepared for Class II construction.

2. User's manual is not provided and should be considered in the end product.

3. All requirements should be fulfilled to standard of IEC 61347-2-13:2006 used in conjunction with IEC 61347-1 (Second Edition): 2007 + A1:2010 + A2:2012 when installing in the end product.

4. Model Differences
   - The basic Model is PSDV180101U which conducted the tests.
   - The model PSDV180101A is similar to basic model except model name.

5. This equipment was evaluated with IP67.

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

15 (-)	**TRANSFORMER HEATING**		**P**
	Windings of separating transformer in a SELV-equivalent controlgear fulfil the requirements according to 7.1 and 11.2 of IEC 60065		P
15.1 (-)	Normal operation		P
	Temperatures do not exceed the changed values of the values in column 2 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c, under normal operation	(See the Appendix I)	P
15.2 (-)	Abnormal operation		P
	Temperatures do not exceed the changed values of the values in column 3 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c, under abnormal conditions of Cl. 16 and fault conditions of Cl. 14		P
	Ambient temperature at t_c ..... :	67.9 degree C	—

16 (-)	**ABNORMAL CONDITIONS**		**P**
16.1 (-)	Control gear which are of the constant voltage output type:		N/A
	a) No LED module inserted		N/A
	b) Double LED modules or equivalent load connected to the output terminals		N/A
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		N/A
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N/A
16.2 (-)	Control gear which are of the constant current output type		P
	a) No LED module connected		N/A
	b) Double the LED modules or equivalent load connected in series to the output terminals	Voltage decreased, temperature stabilized, No damaged, No hazard, No breakdown. <Measured temperature> tc point:: 82.6 °C T101coil: 89.4°C Core: 88.8 °C wood: 80.5 °C oven ambient:: 67.9 °C	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)	Internal protection, No damaged, No hazard, No breakdown. <Measured temperature> tc point:: 70.7 °C T101 Coil: 70.8 °C Core : 70.9 °C wood: 69.8 °C oven ambient: 67.8 °C	P
	Maximum output voltage not exceeded	Max. Rated: 55.0 V d.c. Measured: 50.5 V d.c.	P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P

L	**ANNEX L: PARTICULAR ADDITIONAL REQUIREMENTS FOR CONTROLGEARS PROVIDING SELV** (IEC 61347-1)		P
L.6	**Heating**		**P**
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked ..... :		—
	Winding insulation classified as Class ..... :	Class B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: components	P

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1)]
AC input wire	A	Kiseong cable Inc	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Weihaishi Honglin Wire & Cable	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Hae Kwang Cable	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Shinhwa Electric Wire Co., Ltd	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Dae Young Wire (Tianjin)	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Wonderful Hi-Tech Co., Ltd	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Eleteck Wire & Cable Co., Ltd	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	LTK Wiring Co., Ltd	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Wonderful Hi-Tech Co., Ltd	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	Shenzhen Linoya Electronic Co., Ltd	1015	Min.300 V, 18 AWG, Min. 90 °C	UL 758	UL/cUL
Alternate	D	KDK	SJT	Min.300 V, 105 °C, 18AWG	UL 758	UL/cUL

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1)]
Alternate	D	Do Woo Electric Wire Co., Ltd	2517	Min.300 V, 105 °C, 18AWG	UL 758	UL/cUL
Alternate	D	DOWOO CO., LTD.	UL 2517	Min.300 V, 105 °C, 18AWG	UL 758	UL/cUL
Alternate	D	KISEONG CABLE CO LTD.	60227 IEC 53	Min.300 V, 105 °C, 0.75 or 1.0 ㎟	K60227-1	KC
Alternate	D	Ki Seong	60227 KSC IEC 08	Min.300 V, 90 °C, 0.75 or 1.0 ㎟	K60227-1	KC
Alternate	D	Hae Kwang Cable	AWM 1618	Min.300 V, 18 AWG, 90 °C	UL 758	CSA,UL
Alternate	D	Changshu Hong-Lin Cable Co., Ltd	HVSF	Min.300 V, 90 °C, 0.75 or 1.0 ㎟	JIS C 3306	PSE
Alternate	D	Dae Young Wire (Tianjin)	HVSF	Min.300 V, 90 °C, 0.75 or 1.0 ㎟	JIS C 3306	PSE
Alternate	D	Thai Wonderful Wire Cable Co., Ltd	HVSF	Min.300 V, 90 °C, 0.75 or 1.0 ㎟	JIS C 3306	PSE
Alternate	D	Changshu Hong-Lin Wire & Cable Co., Ltd	60227 IEC 06	Min.300 V, 90 °C, 0.75 or 1.0 ㎟	GB5023.3	CCC
Alternate	D	LTK Cable	60227 IEC 08	Min.300 V, 90 °C, 0.75 or 1.0 ㎟	GB5023.3	CCC
Alternate	D	Samwon Electric Cable	60227 IEC 08	Min.300 V, 90 °C, 0.75 or 1.0 or 1.5 ㎟	KS C IEC60227-3	IEC,KC
Alternate	D	Doowon Cable	60227 IEC 08	Min.300 V, 90 °C, 0.75 or 1.0㎟	KS C IEC60227-3	IEC,KC
Alternate	D	Dae Young Wire	60227 IEC 08	Min.300 V, 90 °C, 0.75 or 1.0 ㎟	KS C IEC60227-3	IEC,KC

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1)]
Alternate	D	Shenzhen linoya electronic co ltd	2517	Min.300 V,105 °C, 18AWG	UL 758	UL/cUL
Alternate	D	Shenzhen linoya electronic co ltd	60227 IEC 53	Min.300 V, 105 °C, 0.75 or 1.0 ㎜²	K60227-1	KC
Fuse (FS101)	A	Littelfuse Phils. Inc.	369	Min. 300 V, T5.0AL	IEC 60248-1	VDE
Fuse (FS102)	A	Littelfuse Phils. Inc.	369	Min. 300 V, T2.0AL	IEC 60248-1	VDE
Varistor (VX01)	A	Thinking Electronics Industrial Co., Ltd	TVR10561	350 Vrms, 4.5 kA,	IEC 61051-2	VDE
Alternate	D	Amotech Co., Ltd.	INR14D561	350 Vrms, 4.5 kA,	IEC 61051-2	VDE
Bleeder Resistors (RX101, RX102, RX103, RX104)	C	Yageo Corporation	RC3216	750 Kohm, Min. 1/4 W (Located after the mains fuse)	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Semco	RC1206			
X-Capacitor (CX101)	A	Cowell Fashion Co., Ltd. Pilkor	PCX2 339	Min. 305 Vac, 47 nF	IEC 60384-14 EN 60384-14	ENEC
Coupling Capacitor (CY101, CY102)	A	Dongil Electronic Co., td	DA	Max. 3.3 nF, 400 Vac, Y1	IEC 60384-14 EN 60384-14	ENEC 14, SEMKO, VDE
Alternate	D	Walsin Technology Corporation. (POE)	AH			VDE,
Line Choke (L100)	C	Kwang Sung Technology Holdings Co. Limited	8013T-152K	Min.125 °C	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Lishin Electronics Limited	8013T-152L			
Line Filter (LX101)	C	TNC Co., Ltd	**CV004300SJT (HF)**	Min.130 °C	IEC 61347-1, IEC-61347-2-13	Tested in apparatus

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1)]
Line Filter (LX102)	C	Lishin Electronics Limited	U16100T	Min.130 °C	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Clover Hi-Tech Co., Ltd	U16100T			
Line Filter (L201)	C	TNC Co., Ltd	PVA2503UNB2	Min.130 °C	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Kwang Sung Electronics Korea Co., Ltd	KV825030			
PFC (L101)	C	NamYang Electronics Co., Ltd	LL18S-5PFC	Min.130 °C	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Lishin Electronics Limited	LL18S-5PFC			
Bridge Diode (BD101)	C	Taiwan Semiconductor Company, Ltd	KBP305G	Min. 600 V, Max. 3 A	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Interchangeable	Interchangeable			
El-capacitor (C102)	C	Sam Young Electronics Co., Ltd	NBC3.2CC500 VB22M	Min. 500V, 22 µF, 105 °C	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Interchangeable	Interchangeable			
FET (Q101)	C	STM	STF9NM60N	Min. 600 V, Max. 6.5 A	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Interchangeable	Interchangeable			
FET (Q102)	C	Fairchild	FQPF6N80C	Min. 800 V, Max. 5.5 A	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Interchangeable	Interchangeable			
Transformer (T101)	C	Nam Yang Electronics Co ., Ltd.	LL18S-5FM	Class B	IEC 61347-1, IEC-61347-2-13	Tested in apparatus
Alternate	D	Dong Guan Top Nation Electronic Limited.	LL18S-5FM			

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1)]
Opto-coupler (PC101)	A	Lite-On Technology Corp.	LTV-100X for VDE (X" in the model name can be from 0 to 9) (Marked: 1008)	Double Insulation Isolation voltage 5000 V	IEC/EN 60065, IEC/EN 60950-1, UL 1577	VDE
Alternate	D	Everlight Electronics Co Ltd	EL101X (X" in the model name can be from 0 to 9) (Marked: EL1018)	Double Insulation Isolation voltage 5000 V		NEMKO
PCB	A	Kingboard Laminates Holdings Ltd	KB-5150&	Min. V-0, 130 °C, CTI, PTI > 600	UL 94, UL 746	UL(E123995)
Alternate	D	Interchangeable	Interchangeable			
Insulation sheet	A	Toray Industries Inc	Lumirror (#)	Min. V-0, 105 °C, 0.05 mm thick.	UL 94	UL (E86511)
Alternate	D	SKC Co., Ltd	SH71S, SG00L, SR50, SR53		UL94	UL (E74359)

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

Bold characters are alternation or alteration or correction of components.

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Appendix I

Temperature Rise dT of Part	dT (K)				Limit dT (K)
	108 Vac, 50 Hz (tc)	108 Vac, 60 Hz (tc)	304 Vac, 50 Hz (tc)	304 Vac, 60 Hz (tc)	
1. Line Filter(LX101) Coil	22.2	21.4	17.7	17.4	65.7/65.1/ 62.3/62.1
2. Line Filter(LX102) Coil	24.7	23.9	18.5	18.3	65.7/65.1/ 62.3/62.1
3. PFC(L101) Coil	27.6	26.8	22.3	22.1	65.7/65.1/ 62.3/62.1
4. Inductor (L100) body	23.5	22.7	18.1	17.9	60.7/60.1/ 57.3/57.1
5. Transformer(T101) Coil	26.8	26.0	23.3	23.1	55.7/55.1/ 52.3/52.1
6. Transformer(T101) Core	26.3	25.5	23.2	22.8	55.7/55.1/ 52.3/52.1
7. PWB near Transformer(T101)	26.1	25.3	22.7	22.5	55.7/55.1/ 52.3/52.1
8. Line Filter(L201) Coil	24.7	23.9	21.6	21.4	55.7/55.1/ 52.3/52.1
9. Tc point Case above Q101	20.0	19.3	16.8	16.6	—
10. wood	16.4	15.8	13.6	13.4	—
11. Ambient temperature	(64.3 °C)	(64.9 °C)	(67.7 °C)	(67.9 °C)	—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Temperature Rise dT of Part	dT (K)				Limit dT (K)
	198 Vac, 60 Hz (tc)	220Vac, 60 Hz (tc)	233.2 Vac 60 Hz (tc)	—	
1. Line Filter(LX101) Coil	17.6	17.9	17.4	—	62.2/62.6/62.1
2. Line Filter(LX102) Coil	18.8	19.1	18.5	—	62.2/62.6/62.1
3. PFC(L101) Coil	22.8	23.1	22.5	—	62.2/62.6/62.1
4. Inductor (L100) body	18.5	18.7	18.1	—	57.2/57.6/57.1
5. Transformer(T101) Coil	23.3	23.7	23.2	—	52.2/52.6/52.1
6. Transformer(T101) Core	23.0	23.5	22.9	—	52.2/52.6/52.1
7. PWB near Transformer(T101)	22.6	23.0	22.5	—	62.2/62.6/62.1
8. Line Filter(L201) Coil	21.5	21.9	21.4	—	62.2/62.6/62.1
9. Tc point Case above Q101	16.8	17.3	16.8	—	—
10. wood	13.6	14.0	13.5	—	—
11. Ambient temperature	(67.8 °C)	(67.4° C)	(67.9 °C)	—	—