



KAREN LIN
 MEAN WELL ENTERPRISES CO LTD
 28 WUQUAN 3RD RD WUGU DIST
 NEW TAIPEI
 248 TAIWAN

Date: 2015/04/24
 Subscriber: 710861002
 PartySite: 74570
 File No: E334687
 Project No: 4786905050
 PD No: 15019364
 Type: R
 PO Number: BRIAN LU 4/21/15

Subject: **Procedure And/Or Report Material**

The following material resulting from the investigation under the above numbers is enclosed.

Issue

<u>Date</u>	<u>Vol</u>	<u>Sec</u>	<u>Pages</u>	<u>Revised Date</u>
2010/10/15	1	5	Revised Description Page(s) 4A,5,6,11,12	2015/04/24
2010/10/15	1	5	New Test Record 3	2015/04/24
2010/10/16	1	6	Revised Description Page(s) 7,8,9,10,14,15	2015/04/24
2010/10/16	1	6	New Test Record 3	2015/04/24
2010/10/17	1	7	Revised Description Page(s) 7A,8,9,14,15	2015/04/24
2010/10/17	1	7	New Test Record 6	2015/04/24
2010/05/05	1	10	Revised Description Page(s) 6,7,8,9,10,13,16,17,18	2015/04/24
2010/05/05	1	10	New Test Record 4	2015/04/24
2011/06/24	1	12	Revised Description Page(s) 7,8,9,13,15,16,18,19,20	2015/04/24
2011/06/24	1	12	New Test Record 4	2015/04/24
2011/09/28	1	14	Revised Description Page(s) 5,6,7,10,11	2015/04/24

Inspections at your plant will be conducted under the supervision of CHEVY CHEN, UL INSPECTION CENTER LINKOU, UL INTERNATIONAL SERVICE LTD, 260 DA-YEH RD, 4TH FL, PEI TOU DISTRICT, TAIPEI, Taiwan, 112., PHONE: 2-28967790, FAX: 2-28917644, EMAIL: chevy.chen@tw.ul.com

Please file revised pages and illustrations in place of material of like identity. New material should be filed in its proper numerical order.

NOTE: Follow-Up Service Procedure revisions DO NOT include Cover Pages, Test Records and Conclusion Pages. Report revisions DO NOT include Authorization Pages, Indices, Section General Pages and Appendixes.

Please review this material and report any inaccuracies to UL's Customer Service Professionals. Contact information for all of UL's global offices can be found at <http://www.ul.com/global/eng/pages/corporate/contactus>.

If you'd like to receive updated materials FASTER, UL offers electronic access and/or delivery of this material. For more details, contact UL's Customer Service Professionals as shown above.

This material is provided on behalf of UL LLC (UL) or any authorized licensee of UL.

SCL File

UL INSPECTION CENTER 408

ADDENDUM TO TRANSMITTAL LETTER

KAREN LIN
MEAN WELL ENTERPRISES CO LTD
28 WUQUAN 3RD RD WUGU DIST
NEW TAIPEI
248 TAIWAN

Date: 2015/04/24
Subscriber: 710861002
PartySite: 74570
File No: E334687
Project No: 4786905050
PD No: 15019364
Type: R
PO Number: BRIAN LU 4/21/15

Subject: Procedure And/Or Report Material

The following material resulting from the investigation under the above numbers is enclosed.

Issue

<u>Date</u>	<u>Vol</u>	<u>Sec</u>	<u>Pages</u>	<u>Revised Date</u>
2011/09/28	1	14	New Test Record 3	2015/04/24

INDEX

* Cat. Nos.	USR	CNR	Section
<p>USR/CNR - Isolated LED Driver Models CLY-100-Z, Y can be G (for with Glue) or N (for without Glue), Z can be 12, 15, 20, 24, 27, 36 for output voltage. Models PLN-100-Z, Z can be 12, 15, 20, 24, 27, 36 for output voltage and models CLG-100-24DLU and CLG-100-24LU.</p> <p>.</p> <p>USR Class 2 Power Supply, Models CLY-100-48 and PLN-100-48, Y can be G (for with Glue) or N (for without Glue).</p>	X	X	1
<p>USR/CNR - LED Driver Models CLy-60-z, where y can be G (with potting compound) or N (without potting compound), z can be 12, 15, 20, 24, 27, 36 for output voltage. Models PLN-60-z, PLN-45-z, z can be 12, 15, 20, 24, 27, 36 for output voltage, without potting compound.</p> <p>USR Class 2 LED Power Supplies, Models CLy-60-48, where y can be G (with potting compound) or N (without potting compound). Models PLN-60-48, PLN-45-48 without potting compound.</p>	X	X	2
<p>Isolated Class 2 LED Power Supplies, Models PLY-20-X, where X can be 20, 24, 30, 36, 42, for output voltage, Y can be N (for with enclosure) or P (for without enclosure).</p>	x	x	3
<p>Power Supplies with Class 2 output, Models CEN-60-Y Series, where Y can be 12, 15, 20, 24, 30, 36, 42, 48 or 54 for output voltage, and model CEN-75-Y, where Y can be 15, 20, 24, 30, 36, 42, 48 or 54 for output voltage.</p>	X	X	4
<p>*Isolated Class 2 LED Power Supplies: Models HLG-100-YZ Series, where Y can be 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A or B.</p> <p>Models HLG-100H-YZ Series, where Y can be 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A, B or AB</p>	x	x	5
<p>*LED power supplies other than class 2: Models HLG-120-YZ Series, where Y can be 12, 15, 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A or B. Models HLG-120H-YZ Series, where Y can be 12, 15, 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A, B or AB</p>	x	x	6

INDEX (cont.)

Cat. Nos.	USR	CNR	Section
*Models HLG-150-YZ and HLG-185-YZ Series, where Y can be 12, 15, 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A or B.	x	x	7
Models HLG-150H-YZ and HLG-185-YZ Series, where Y can be 12, 15, 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A, B or AB.			
Models LPF-XY-ZQ, where X may be 40 or 60, Y may be blank or D; Q may be blank or LU; and Z may be 12, 15, 20, 24, 30, 36 and 42.	X	X	8
Models LPF-XY-ZQ, where X may be 40 or 60, Y may be blank or D; Q may be blank or LU; and Z may be 48 and 54.	X		8
LED Drivers Other Than Class 2, Models CLG-150-12A, CLG-150-15A, CLG-150-20A, CLG-150-24A, CLG-150-30A, CLG-150-36A, CLG-150-12B, CLG-150-15B, CLG-150-20B, CLG-150-24B, CLG-150-30B, CLG-150-36B, CLG-150-12C, CLG-150-15C, CLG-150-20C, CLG-150-24C, CLG-150-30C, CLG-150-36C, CLG-150-12, CLG-150-15, CLG-150-20, CLG-150-24, CLG-150-30, CLG-150-36, CLG-150-48A, CLG 150-48B, CLG-150-48C and CLG-150-48	X	X	9
LED Drivers Other Than Class 2, Models: HLG-240H-yz, where y = 12, 15, 20, 24, 30, 36, 42, 48, 54 ; z = Blank, A, B, or C); Models: HLG-240-yz, where y = 12, 15, 20, 24, 30, 36, 42, 48, or 54 and z = Blank, A, B, or C.	X	X	10
Isolated Class 2 LED Power Supplies, Models CEN-100-X, where X can be 20, 24, 30, 36, 42, for output voltage.	X	X	11
Class 2 LED Power Supplies, Models CEN-100-X, where X can be 48,54 for output voltage.	X	-	11
*Isolated Class 2 LED Power Supplies: HLG-80H-YZ (for units with metal enclosure), where Y can be 12, 15, 20, 24, 30, 36, 42, 48, 54 and Z can be A, B, D, AB or blank. HLN-80H-YZ (for units with plastic enclosure), where Y can be 12, 15, 20, 24, 30, 36, 42, 48, 54 and Z can be A B or AB. HLP-80H-Y (for units without enclosure), Y can be 12, 15, 20, 24, 30, 36, 42, 48, 54. LPF-90X-Y, where Y can be 15, 20, 24, 30, 36, 42, 48, 54 and X can be D or blank.	X	X	12
*			
Isolated Class 2 LED Power Supplies: PLP-X-Y, where X can be 30, 45 or 60 and Y can be 12 or 24.	X	X	13
Isolated Class 2 LED Power Supplies: PLP-X-Y, where X can be 30, 45 or 60 and Y can be 48.	X	-	13
LED Drivers Other Than Class 2, Isolated output Models: HLG-320H-yz, where y = 12, 15, 20, 24, 30, 36, 42, 48, 54; z = Blank, A, B, C, or D	X	X	14

DESCRIPTION

PRODUCT COVERED:

USR/CNR - Isolated Class 2 LED Power Supplies: Models HLG-100-YZ Series, where Y can be 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A or B.

Models HLG-100H-YZ Series, where Y can be 20, 24, 30, 36, 42, 48 or 54 for output voltage, and Z = blank, A, B or **AB**.

ELECTRICAL RATINGS:

Model	Input (ac)			Output (dc)	
	V	A	Hz	V	A
HLG-100-20 HLG-100-20A HLG-100-20B	100-240	1.2	50/60	20	4.8
HLG-100H-20 HLG-100H-20A HLG-100H-20B HLG-100H-20AB	100-240 277	1.2 0.5	50/60	20	4.8
HLG-100-24 HLG-100-24A HLG-100-24B	100-240	1.2	50/60	24	4
HLG-100H-24 HLG-100H-24A HLG-100H-24B HLG-100H-24AB	100-240 277	1.2 0.5	50/60	24	4
HLG-100-30 HLG-100-30A HLG-100-30B	100-240	1.2	50/60	30	3.2
HLG-100H-30 HLG-100H-30A HLG-100H-30B HLG-100H-30AB	100-240 277	1.2 0.5	50/60	30	3.2
HLG-100-36 HLG-100-36A HLG-100-36B	100-240	1.2	50/60	36	2.65

HLG-100H-36 HLG-100H-36A HLG-100H-36B HLG-100H-36AB	100-240 277	1.2 0.5	50/60	36	2.65
HLG-100-42 HLG-100-42A HLG-100-42B	100-240	1.2	50/60	42	2.28
HLG-100H-42 HLG-100H-42A HLG-100H-42B HLG-100H-42AB	100-240 277	1.2 0.5	50/60	42	2.28
HLG-100-48 HLG-100-48A HLG-100-48B	100-240	1.2	50/60	48	2.0
HLG-100H-48 HLG-100H-48A HLG-100H-48B HLG-100H-48AB	100-240 277	1.2 0.5	50/60	48	2.0
HLG-100-54 HLG-100-54A HLG-100-54B	100-240	1.2	50/60	54	1.77
HLG-100H-54 HLG-100H-54A HLG-100H-54B HLG-100H-54AB	100-240 277	1.2 0.5	50/60	54	1.77

TECHNICAL CONSIDERATIONS (NOT FOR UL FIELD REPRESENTATIVE USE):

This component has been judged on the basis of the spacings required in the standard for Light Emitting Diode (LED) Light Sources for Use In Lighting Products, UL 8750, First Edition, which would cover the component itself if submitted for Listing. This product complies with NEC Class 2 output limits only.

USR - Indicates investigation to the United States requirements for the standard for Light Emitting Diode (LED) Light Sources for Use In Lighting Products, UL 8750, First Edition and the Standard for Class 2 Power Units, UL 1310, Fifth Edition.

CNR - Indicates investigation to the Canadian Standard for Luminaires, CSA C22.2 No. 250.0-08; and the Standard for Power Supplies with Extra-Low-Voltage Class 2 Outputs, CAN/CSA-C22.2 No. 223-M91 and CAN/CSA-C22.2 No. 107.1 dated June 1991 (Reaffirmed 2003).

SPACING OF ELECTRICAL PARTS:

The spacing between uninsulated live parts of opposite polarity, including magnet wire, and between those parts and exposed metal parts that can be contacted shall not be less than the clearance (through-air) and the creepage distance (over an insulating surface) as described:

Locations of live electrical parts and conditions	Min spacing, mm		
	Clearance	Creepage Distance for printed wiring boards (CTI < 175)	Creepage Distance for ceramic and other materials (CTI => 600)
Between parts within drivers for indoor (dry), and outdoor (damp or wet) locations (125v)	0.5	1.5	0.75
Between parts within drivers for indoor (dry), and outdoor (damp or wet) locations (300v)	1.5	3.0	1.5
Between parts on a printed wiring board that are soldered in place but can move in production prior to soldering to fixed parts; or between parts on a printed wiring board to the enclosure.	3.0 (for 125v) 3.9 (for 300v)	-	-
Components on a printed wiring board buried in potting compound	-	0.8	0.8

Conditions of Acceptability - When installed in the end-use equipment, consideration shall be given to the following:

1. These power supplies have been evaluated to Class 2 output requirements for dc circuits with a max. of one Class 2 output.
2. These products are provided with the following electrical ratings:

Model	Input (ac)			Output (dc)	
	V	A	Hz	V	A
HLG-100-20 HLG-100-20A HLG-100-20B	100-240	1.2	50/60	20	4.8
HLG-100H-20 HLG-100H-20A HLG-100H-20B HLG-100H-20AB	100-240 277	1.2 0.5	50/60	20	4.8
HLG-100-24 HLG-100-24A HLG-100-24B	100-240	1.2	50/60	24	4
HLG-100H-24 HLG-100H-24A HLG-100H-24B HLG-100H-24AB	100-240 277	1.2 0.5	50/60	24	4
HLG-100-30 HLG-100-30A HLG-100-30B	100-240	1.2	50/60	30	3.2
HLG-100H-30 HLG-100H-30A HLG-100H-30B HLG-100H-30AB	100-240 277	1.2 0.5	50/60	30	3.2
HLG-100-36 HLG-100-36A HLG-100-36B	100-240	1.2	50/60	36	2.65
HLG-100H-36 HLG-100H-36A HLG-100H-36B HLG-100H-36AB	100-240 277	1.2 0.5	50/60	36	2.65
HLG-100-42 HLG-100-42A HLG-100-42B	100-240	1.2	50/60	42	2.28
HLG-100H-42 HLG-100H-42A HLG-100H-42B HLG-100H-42AB	100-240 277	1.2 0.5	50/60	42	2.28
HLG-100-48 HLG-100-48A HLG-100-48B	100-240	1.2	50/60	48	2.0
HLG-100H-48 HLG-100H-48A HLG-100H-48B HLG-100H-48AB	100-240 277	1.2 0.5	50/60	48	2.0
HLG-100-54 HLG-100-54A HLG-100-54B	100-240	1.2	50/60	54	1.77
HLG-100H-54 HLG-100H-54A HLG-100H-54B HLG-100H-54AB	100-240 277	1.2 0.5	50/60	54	1.77

3. These products shall be enclosed in the end product.
4. These products are suitable for use in dry, damp and wet locations.
- *5. The Temperature Test should be conducted in the end.
6. These products are suitable for factory wiring only.

*

7. The output of HLG-100-48, HLG-100H-48, HLG-100-54 and HLG-100H-54, exceeded the CEC Class 2 limits and only comply with NEC Class 2 limits. When used in products intended for Canada, consideration of the output regarding suitable load connections and additional protection for the risk of shock and fire shall be considered in the end product.

8. **These products may be marked "Type HL" for use in Class I, Division 2 hazardous (Classified) location luminaires.**

CONSTRUCTION DETAILS:

General - See the Sec. General.

Printed Wiring Boards (PWB) - All PWBs, unless otherwise specified in the description are R/C (ZPMV2), rated min V-1, min. 105°C.

Soldered Connections - All connections are mechanically secured before soldering.

Grounding/Bonding - All accessible dead-metal parts are bonded together by screws or rivets to the frame of the unit.

Markings - In addition to the Section General, the following markings shall be also marked on the unit.

1. Company Name, File No., or Trade Mark (if authorized).
2. Model Designation.
3. Optional - Date Code.
4. Optional - Electrical Ratings.
5. Optional - "Output Type: Class 2".
6. Optional - "Suitable For dry, damp and wet locations".
7. Optional - The Polarity of the Input and Output Connections.
8. Optional - Maximum Ambient Temperature: 60°C.
9. **Optional** - "**Type HL**".

LED Power Supplies, Models HLG-100, HLG-100H
FIG 1-2

General - Description below represents all models unless specifically noted otherwise. The Recognition below applies to models with input ratings of 100-277 V.

- *1. **Top Enclosure and bottom enclosure** - Painted aluminum, min **1.6 mm** thick, four-piece construction secured together by screws, overall dimensions min 192 by 68 by 38 mm.
2. Input Cord - Listed (ZJCZ, ZJCZ7), non-detachable 3 conductors flexible cord, Type SVT, SVO, STO, SJT, SJTW, SJOW or STW (when units are marked for indoor use) or SJTW, SJOW or STW (when units are marked for indoor or outdoor use), rated min. 18 AWG, min. 105°C, VW-1, one end mechanically secured and soldered to PWB. Grounding conductor terminated and mechanically secured to metal enclosure and then mechanically secured and soldered to PWB.

Alternate - Listed (QPOR), NEXANS CANADA INC, jacket type TC/TC-ER, rated 600V, 3C/16AWG, rate 90°C/75°C for dry/wet, suitable only for use LED power supplies marked for use in the United States

3. Output Cord - Listed (ZJCZ, ZJCZ7), non-detachable flexible cord, two conductors flexible cord, Type SVT, SVO, STO, SJT, SJTW, SJOW or STW rated min. 18 AWG, min.105°C, VW-1, one end mechanically secured and soldered on PWB.

Alternate - Listed (QPOR), NEXANS CANADA INC, jacket type TC/TC-ER, rated 600V, 3C/16AWG, rate 90°C/75°C for dry/wet, suitable only for use LED power supplies marked for use in the United States

- *4. Insulation (liner) Sheet - R/C (QMFZ2), min **0.20mm** thick, rated min. V-2, 105 °C, provided as liner between PWB and inside bottom and inside side walls of the enclosure, see ILL1 for overall shape.

Alternate - R/C (OANZ2), min. V-2, min. 105°C, min. 0.20 mm thick, completely wraps around the circuit board.

LED Power Supplies, Models HLG-100, HLG-100H
FIG. 3-5

General - Fig. 3-5 shows the internal view of the units.

1. Printed Wiring Board - R/C (ZPMV2), rated min. V-1, min. 130°C. See ILL. 2 for component and trace layout.
2. Fuse (FS1) - R/C (JDYX2), CN, Conquer Electronics Co. Ltd., Type MST, rated 3.15 A, 300 V.

Alternate - Same as above except, Listed, CN, rated max 3.15 A, min. 300 V.

3. X-Capacitors (C1, C2) -R/C (FOKY2, FOKY8), or CSA Certified, C1 rated min. 277 V ac, max. 0.82uF. C2 rated min. 277Vac, max. 0.82uF.
4. Bleeder Resistors (R1, R2, R3) - Rated Max. 330k ohms, min 1/4 W.
5. Choke (L2) -Open-type construction, Core: Ferrite, measured overall 26.5 mm by 19 mm by 22.5 mm. Coil: R/C (OBMW2), rated min. 130°C.
6. Choke (LF2) -, Open-type construction, Core: Ferrite, measured overall 14.1 mm OD by 6.6 mm ID by 6.3 mm wide. Coil: R/C (OBMW2), rated min. 130°C.
7. Choke (LF3) -Optional, Open-type construction, Core: Ferrite, measured overall 16 mm OD by 12 mm ID by 8 mm wide. Coil: R/C (OBMW2), rated min. 130°C.
8. Inductor (L1) -Open-type construction, Core: Ferrite, measured overall 17.27 mm OD by 9.65 mm ID by 6.35 mm wide. Coil: R/C (OBMW2), rated min. 130°C.
9. Capacitors (C3, C4, C24, C30) -Line-to-Ground, Murata Mfg Co., Ltd. , type KX or KH, C3 and C4 rated max. 1000pF, **min.**250 V ac; C24 rated max. 100 pF, min.250 V ac, C30 rated max. 470 pF, min.250 V ac

Alternate - Same as above, except by TDK Corp., type CD, CS

Alternate - same as above, except by Walsin Technology Corp., type AC or AH,

10. Bridge Rectifier (BD1) - rated min. 500 V, min. 4 A secured to Heat Sink by screw.
11. Varistor (ZNR1) -R/C (VZCA2), CN, rated min. 320V ac.
12. Varistor (ZNR2) -R/C (VZCA2), CN, rated min. 230V ac,
13. Capacitor (C5) - Electrolytic type, rated min. 400 V, 82 μ F, min 105°C.
15. Transistor (Q5,Q6) - Rated min 500 V, min ~~12~~ **11** A
16. Thermistor (RTH1) -Rated min. 2A , max. 20 Ohms .
17. Optical Isolators (U3, U4) - R/C (FPQU2), CN, Sharp Corp Electronic Components Group, Type PC123, rated 5000 V ac isolation voltage.
- Alternate - Same as above except R/C (FPQU2, FPQU8), Cosmo Electronics Corp., Type K1010, rated 5000 V ac isolation voltage.
- Alternate - Same as above except R/C (FPQU2, FPQU8), Lite-on Technology Corp., Type LTV817, **LTV-817M**,rated 5000 V ac isolation voltage.
- Alternate - Same as above except R/C (FPQU2), CN, NEC Compound Semiconductor Devices Ltd., Type PS2561-1, rated 5000 V ac isolation voltage.
- Alternate - Same as above except R/C (FPQU2, FPQU8), Isocom Ltd., Type ISP621 or ISP817, rated 5000 V ac isolation voltage.
18. Bridge Capacitor (C31) -, Manufactures shown below, rated max. 1000 pF, min. 250 V ac. Marked "Y1".

Manufacturer	Type
Murata Mfg Co.	KX
Walsin Technology Corp	AH
TDK Corp	CD

19. Transformer (T1) -Designated SBI4.2, Class A. See below for details.

Constructed as follow:

- A. Core - Ferrite core, core measured 33 by 40.6 by 14 mm thick, core served as secondary part.
- B. Bobbin - R/C (QMFZ2), Sumitomo Bakelite Co. Ltd. (E41429), Type PM-9820, PM-9630, rated V-0, 150°C, min. 0.51 mm thick.
- C. Windings - Enameled copper magnet wire, R/C (OBMW2), rated min. 130°C random wound.
- D. Triple Insulated Winding - R/C (OBJT2), ToKoKu Electric Co., LTD, Type TIW-2X, TIW-3X. rated min. 130°C

Alternate - R/C (OBJT2), Furukawa Electric Co., Ltd., Type TEX-E, rated min. 130°C
- E. Insulation Tape - R/C (OANZ2), Minnesota Mining & Mfg Co., Type 1350F-1, 1350T-1, 1351-1 ,1318-1 rated 130°C.

Alternate - R/C (OANZ2), Bondtec Pacific Co Ltd , Type 370S ,rated 130°C.
- F. Insulation Tubing - R/C (YDPU2), Great Holding Industrial Co. Ltd., Type TFL/TFT, rated 200°C. Provided on all exit leads.

Alternate - Same as above, except ZEUS INDUSTRIAL PRODUCTS INC., Type TFE-TW-300, TFE-LW-150, **min.** 150V rated 200°C

G. Insulation as follows:

Model	Windings and insulation
HLG-100-20 HLG-100-20A HLG-100-20B	See ILL. 3 for winding and insulation details (part # TF-2055)
HLG-100-24 HLG-100-24A HLG-100-24B	See ILL. 4 for winding and insulation details (part # TF-2056)
HLG-100-30 HLG-100-30A HLG-100-30B	See ILL. 5 for winding and insulation details (part # TF-2057)
HLG-100-36 HLG-100-36A HLG-100-36B	See ILL. 6 for winding and insulation details (part # TF-2058)
HLG-100-42 HLG-100-42A HLG-100-42B	See ILL. 7 for winding and insulation details (part # TF-2059)
HLG-100-48 HLG-100-48A HLG-100-48B	See ILL. 8 for winding and insulation details (part # TF-2060)
HLG-100-54 HLG-100-54A HLG-100-54B	See ILL. 9 for winding and insulation details (part # TF-2061)
HLG-100H-20 HLG-100H-20A HLG-100H-20B HLG-100H-20AB	See ILL. 10 for winding and insulation details (part # TF-2075)
HLG-100H-24 HLG-100H-24A HLG-100H-24B HLG-100H-24AB	See ILL. 11 for winding and insulation details (part # TF-2076)
HLG-100H-30 HLG-100H-30A HLG-100H-30B HLG-100H-30AB	See ILL. 12 for winding and insulation details (part # TF-2077)
HLG-100H-36 HLG-100H-36A HLG-100H-36B HLG-100H-36AB	See ILL. 13 for winding and insulation details (part # TF-2078)
HLG-100H-42 HLG-100H-42A HLG-100H-42B HLG-100H-42AB	See ILL. 14 for winding and insulation details (part # TF-2079)
HLG-100H-48 HLG-100H-48A HLG-100H-48B HLG-100H-48AB	See ILL. 15 for winding and insulation details (part # TF-2080)
HLG-100H-54 HLG-100H-54A HLG-100H-54B HLG-100H-54AB	See ILL. 16 for winding and insulation details (part # TF-2081)

- *20. Potting Compound - R/C (QMFZ2), SHIN-ETSU SILICONE TAIWAN CO LTD. (E174951), Type KET-132 A/B, nc color, V-0, rated 105°C, min. 1.0 mm thick. Fully filled with the unit.

Alternative: R/C (QMFZ2), Dow Corning Corp. (E40195), Type SYLGARD 160, gray color, V-0, rated 105°C, min. 1.5 mm thick. Fully filled with the unit.

Alternate: R/C (QMFZ2), GUANGZHOU HUITIAN FINE CHEMICAL LTD. (E306078), Type 5299, gray color, V-0, rated 105°C, min. 1.0 mm thick. Fully filled with the unit.

- *21. HS1 - Aluminum, min. 3.0 mm thick, overall dimension min. 52.5 by 23 mm.
*22. HS2 - Aluminum, min. 2.0 mm thick, overall dimension min. 22.5 by 35.75 mm.
*23. HS3 - Aluminum, min. 2.0 mm thick, overall dimension min. 36 by 23 mm

MODELS HLG-100H-YA and HLG-100-YA

General - Models HLG-100H-YA and HLG-100-YA are similar to HLG-100H-Y and HLG-100-Y respectively except as noted below.

- *1) **Top Enclosure and bottom enclosure** - Painted aluminum, min 1.6 mm thick, four-piece construction secured together by screws, overall dimensions min 192 by 68 by 38 mm. Top cover has two 10.5mm diameter openings.
2) Topper - PVC bushing. Outer portion measures 10.5 mm diameter, provided Two at the openings of the top enclosure.

MODELS HLG-100H-YB and HLG-100-YB

General - Models HLG-100H-YB and HLG-100-YB are similar to HLG-100H-Y and HLG-100-Y respectively except as noted below.

- 1) Dimming Circuit - provided at the secondary side of the circuit inside the unit.
2) Dimming Circuit - Same as above, except the Dimming circuit leads extend outside on the secondary side of the unit, the leads are R/C (AVLV2/AVLV8), rated min. 80°C, min. 300V, min. 18 AWG/2C.

Alternate - Same as above except for Listed (ZJCZ, ZJCZ7), Type SVT, SVO, STO, SJT, SJTW, SJOW or STW, rated min. 300 V, min. 80°C, 18 AWG/2C.

Alternate - Listed (QPOR), NEXANS CANADA INC, jacket type TC/TC-ER, rated 600V, 3C/16AWG, rate 90°C/75°C for dry/wet, suitable only for use LED power supplies marked for use in the United States

MODELS HLG-100H-YAB

General - Models HLG-100H-YAB are similar to HLG-100H-YB except as noted below.

- *1) **Top Enclosure and Bottom enclosure** - Painted aluminum, min **1.6** mm thick, four-piece construction secured together by screws, overall dimensions min 192 by 68 by 38 mm. Top cover has one 10.5mm diameter opening.
- 2) Topper - PVC bushing. Outer portion measures 10.5 mm diameter, provided one at the opening of top enclosure.

明緯企業股份有限公司

廠商編號:
機種:HLG-120H-20

變壓器圖面

試樣圖面 正式圖面
圖號:TF-2075-R1
日期:2010-06-25

線路圖(以說明為主)

剖面圖

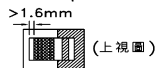
外觀說明: 非明緯製造請修改為該公司的絕緣系統號碼
捺印如圖示廠商Logo及序號

線路層次	相位始末	線徑(φ)	圈數(T)	線繞方式	膠帶層數(L)	電感(H)	DC.R(Max.)mΩ	說明	BOBBIN	1. 昱京LP-3320(Pitch=35mm)
N1	14-FL1	0.3φ	3	偏密繞	0	6.6~9.8u	75	1. 第 1,4,7 Pin除 2. 主線圈感量 5-6 Lm=2.3mH~2.5mH 3. 主線圈漏感 5-6(N4和N5短路) Lk=254uH~272uH 4. N1繞組繞線於初級,引線至次級PIN腳 5. N1,N2使用三層絕緣線 出線加鐵弗龍套管 6. FL1出線於PIN14旁FL1出線長10mm,鍍錫10mm,加黑色套管 7. 所有出線加套管 8. 線材使用155°C等級(2UE+Ny) 9. N4,N5使用0.1φ×180股須捲成單股繞製,勿分成兩股並繞	CORE	1. LP-3320(3C94)
N2	3-2	0.3φ	3	偏密繞	0	6.6~9.8u	55		GAP	有 <input checked="" type="checkbox"/> 無 <input type="checkbox"/> Test Frequency:50KHz/0.25V
N3	5-6	0.1φ ×25	54	密繞	2	2.4m	330		耐壓	初級 ↔ 次級 4KVac 1mA/sec 初級 ↔ Core 4KVac 1mA/sec
N4	12,13 -9	0.1φ ×180	5	並繞	0	17.1~25.7u	7		規範	次級 ↔ Core ---KVac mA/sec
N5	8- 10,11	0.1φ ×180	5		絕緣阻抗	500VDC > 100 MΩ				
								安規要求	<input checked="" type="checkbox"/> IEC60950-1 CLASS B	
								修訂	99年06月25日 1.訂正N1~N3 DC.R值 3.修改說明20 2.機高改23.3mm max.	
								審核	設 計 確 認 製 圖	

- 10. E Core結合處(Core中心柱)須點軟膠
- 11. 此料號變壓器不宜列為免驗物料
- 12. 供應廠商每批均須檢附測試報告
- 13. 漏感量測時Fly線不與次級端短路

- 14. Bobbin下方(與PCB接觸處)不可有凡立水突起膠塊
- 15. 組裝磁芯時,層GAP之磁芯置於次級側
- 16. N4,N5繞製時採並繞方式繞製
- 17. PIN腳吃錫要飽滿

- 18. 所有繞組不可任意更改極性
- 19. 變壓器初級側磁芯包覆Tape二層後,Tape不能有凸點產生
- 20. 次級側Cover不裝於Bobbin上,此移除Cover空間要預留(約>1.6mm)後含浸



明緯企業股份有限公司

廠商編號:
機種:HLG-120H-24

變壓器圖面

試樣圖面 圖號:TF-2076-R1
 正式圖面 日期:2010-06-25

線路圖(以說明為主)

剖面圖

外觀說明: 非明線製造請修改為該公司的絕緣系統號碼
捺印如圖示廠商 Logo 及序號

繞層層次	相位始末	線徑(φ)	圈數(T)	繞線方式	膠帶層數(L)	電感(H)	DC.R(Max.)mΩ	說明
N1	14-FL1	0.3φ	3	偏密繞	0	6.7~10u	75	1. 第 1,4,7 Pin除 2. 主線圈電感 5-6 Lm=2.3mH~2.5mH 3. 主線圈漏感 5-6(N4和N5短路) Lk=254uH~272uH 4. N1繞組繞線於初級,引線至次級PIN腳 5. N1,N2使用三層絕緣線 出線加鐵弗龍套管 6. FL1出線於PIN14旁FL1出線長10mm,鍍錫10mm,加黑色套管 7. 所有出線加套管 8. 線材使用155°C等級(2UE+Ny) 9. N4,N5使用0.1φ×150股須捲成單股繞製,勿分成兩股並繞
N2	3-2	0.3φ	3	偏密繞	0	6.7~10u	55	
N3	5-6	0.1φ ×25	54	密繞	2	2.4m	330	
N4	12,13 -9	0.1φ ×150	6	並繞	0	24.7~37.1u	8	
N5	8- 10,11	0.1φ ×150	6		0	24.7~37.1u	8	

BOBBIN	1. 昱京 LP-3320(Pitch=35mm)
CORE	1. LP-3320(3C94)
GAP	有 <input checked="" type="checkbox"/> 無 <input type="checkbox"/> Test Frequency:50KHz/0.25V
耐壓	初級 ←→ 次級 4KVac 1mA/sec
	初級 ←→ Core 4KVac 1mA/sec
規範	次級 ←→ Core ---KVac mA/sec
	絕緣阻抗 500VDC > 100 MΩ
安規要求	<input checked="" type="checkbox"/> IEC60950-1 CLASS B
修訂	99年06月25日 1.訂正N1~N3 DC.R 3.修改說明20 2.線高改23.3mm max.
審核	設計 <input type="checkbox"/> 確認 <input type="checkbox"/> 製圖 <input type="checkbox"/>

2004-09-14

10. E Core結合處(Core中心柱)須點軟膠
 11. 此料號變壓器不宜列為免驗物料
 12. 供應廠商每批均須檢附測試報告
 13. 漏電量測時Fly線不與次級端短路

14. Bobbin下方(與PCB接觸處)
 不可有凡立水突起膠塊
 15. 組裝鐵芯時,層GAP之鐵芯置於次級側
 16. N4,N5繞製時採並繞方式繞製
 17. PIN腳吃錫要飽滿

18. 所有繞組不可任意更改極性
 19. 變壓器初級側鐵芯包覆Tape二層後,Tape不能
 有凸點產生
 20. 次級側Cover不裝於Bobbin
 上,此移除Cover空間要預留
 (約>1.6mm)後合浸

明緯企業股份有限公司

廠商編號:
機種:HLG-120H-30

變壓器圖面

試樣圖面 圖號:TF-2077-R1
 正式圖面 日期:2010-06-25

線路圖(以說明為主)

剖面圖

外觀說明: 非明線製造請修改為該公司的絕緣系統號碼
捺印如圖示廠商 Logo 及序號

繞組層次	相位始末	線徑(φ)	圈數(T)	繞線方式	膠帶層數(L)	電感(H)	DC.R(Max.)mΩ	說明
N1	14-FL1	0.3φ	3	偏密繞	0	6.2~9.4u	75	1. 第 1,4,7 Pin除
N2	3-2	0.3φ	3	偏密繞	0	6.2~9.4u	55	2. 主線圈電感 5-6 Lm=2.09mH~2.3mH
N3	5-6	0.1φ ×25	52	密繞	2	2.2m	320	3. 主線圈漏感 5-6(N4和N5短路) Lk=237uH~253uH
N4	12,13 -9	0.1φ ×140	7	並繞	0	32.5~48.7u	10	4. N1繞組繞線於初級,引線至次級PIN腳
N5	8- 10,11	0.1φ ×140	7		0	32.5~48.7u	10	5. N1,N2使用三層絕緣線 出線加鐵弗龍套管 6. FL1出線於PIN14旁FL1出線長10mm,鍍錫10mm,加黑色套管 7. 所有出線加套管 8. 線材使用155°C等級(2UE+Ny) 9. N4,N5使用0.1φ×140股須捲成單股繞製,勿分成兩股並繞

BOBBIN 1. 昱京 LP-3320(Pitch=35mm)

CORE 1. LP-3320(3C94)

GAP 有 無 Test Frequency:50KHz/0.25V

耐壓 初級 ↔ 次級 4KVac
1mA/sec
初級 ↔ Core 4KVac
1mA/sec

規範 次級 ↔ Core ---KVac
mA/sec

絕緣阻抗 500VDC > 100 MΩ

安規要求 IEC60950-1 CLASS B

修訂 99年06月25日 1.訂正 DC.R值 3.修改說明 20
2.線高改 23.3mm max.

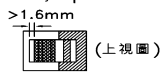
審核 設計 確認 製圖

2004-09-14

- 10. E Core結合處(Core中心柱)須點軟膠
- 11. 此料號變壓器不宜列為免驗物料
- 12. 供應廠商每批均須檢附測試報告
- 13. 漏電量測時Fly線不與次級端短路

- 14. Bobbin下方(與PCB接觸處)不可有凡立水夾起膠塊
- 15. 組裝鐵芯時,層GAP之鐵芯置於次級側
- 16. N4,N5繞製時採並繞方式繞製
- 17. PIN腳吃錫要飽滿

- 18. 所有繞組不可任意更改極性
- 19. 變壓器初級側鐵芯包覆Tape二層後,Tape不能有凸點產生
- 20. 次級側Cover不裝於Bobbin上,此移除Cover空間要預留(約>1.6mm)後含浸



明緯企業股份有限公司

廠商編號:
機種:HLG-120H-36

變壓器圖面

試樣圖面 圖號:TF-2078-R1
 正式圖面 日期:2010-06-25

線路圖(以說明為主)

剖面圖

外觀說明: 非明線製造請修改為該公司的絕緣系統號碼
捺印如圖示廠商 Logo 及序號

繞線層次	相位始末	線徑(φ)	圈數(T)	繞線方式	膠帶層數(L)	電感(H)	DC.R(Max.) mΩ	說明
N1	14-FL1	0.3φ	3	偏密繞	0	6.6~9.8u	75	1. 第 1,4,7 Pin除
N2	3-2	0.3φ	3	偏密繞	0	6.6~9.8u	55	2. 主線圈電感 5-6 Lm=1.9mH~2.1mH
N3	5-6	0.1φ ×25	50	密繞	2	2m	300	3. 主線圈漏感 5-6(N4和N5短路) Lk=220uH~236uH
N4	12,13 -9	0.1φ ×120	8	並繞	0	44~66u	12	4. N1繞組繞線於初級,引線至次級PIN腳
N5	8- 10,11	0.1φ ×120	8		0	44~66u	12	5. N1,N2使用三層絕緣線 出線加鐵弗龍套管 6. FL1出線於PIN14旁FL1出線長10mm,鍍錫10mm,加黑色套管 7. 所有出線加套管 8. 線材使用155°C等級(2UE+Ny) 9. N4,N5使用0.1φ×120股須捲成單股繞製,勿分成兩股並繞

BOBBIN 1. 昱京 LP-3320(Pitch=35mm)

CORE 1. LP-3320(3C94)

GAP 有 無 Test Frequency:50KHz/0.25V

耐壓 初級 ← 次級 4KVac
1mA/sec
初級 ← Core 4KVac
1mA/sec

規範 次級 ← Core ---KVac
mA/sec

絕緣阻抗 500VDC > 100 MΩ

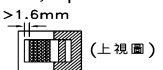
安規要求 IEC60950-1 CLASS B

修訂 99年06月25日 1.訂正N1~N3 DC.R 3.修改說明20
2.線高改23.3mm max.

審核	設計	確認	製圖
----	----	----	----

2004-09-14

- 10. E Core結合處(Core中心柱)須點軟膠
- 11. 此料號變壓器不宜列為免驗物料
- 12. 供應廠商每批均須檢附測試報告
- 13. 漏電量測時Fly線不與次級端短路
- 14. Bobbin下方(與PCB接觸處)不可有凡立水突起膠塊
- 15. 組裝鐵芯時,層GAP之鐵芯置於次級側
- 16. N4,N5繞製時採並繞方式繞製
- 17. PIN腳吃錫要飽滿
- 18. 所有繞組不可任意更改極性
- 19. 變壓器初級側鐵芯包覆Tape二層後,Tape不能有凸點產生
- 20. 次級側Cover不裝於Bobbin上,此移除Cover空間要預留(約>1.6mm)後含浸



明緯企業股份有限公司

廠商編號:
機種:HLG-120H-42

變壓器圖面

試樣圖面 圖號:TF-2079-R1
 正式圖面 日期:2010-06-25

線路圖(以說明為主)

剖面圖

外觀說明: 非明線製造請修改為該公司的絕緣系統號碼
捺印如圖示廠商 Logo 及序號

繞組層次	相位始末	線徑(φ)	圈數(T)	繞線方式	膠帶層數(L)	電感(H)	DC.R(Max.) mΩ	說明
N1	14-FL1	0.3φ	3	偏密繞	0	6.4~9.6u	75	1. 第 1,4,7 Pin除
N2	3-2	0.3φ	3	偏密繞	0	6.4~9.6u	55	2. 主線圈電感 5-6 Lm=2.1mH~2.3mH
N3	5-6	0.1φ ×25	52	密繞	2	2.2m	320	3. 主線圈漏感 5-6(N4和N5短路) Lk=237uH~253uH
N4	12,13 -9	0.1φ ×100	10	並繞	0	65.7~98.5u	19	4. N1繞組繞線於初級,引線至次級PIN腳
N5	8- 10,11	0.1φ ×100	10		0	65.7~98.5u	19	5. N1,N2使用三層絕緣線 出線加鐵弗龍套管 6. FL1出線於PIN14旁FL1出線長10mm,鍍錫10mm,加黑色套管 7. 所有出線加套管 8. 線材使用155°C等級(2UE+Ny) 9. N4,N5使用0.1φ×100股須捲成單股繞製,勿分成兩股並繞

BOBBIN	1. 昱京 LP-3320(Pitch=35mm)
CORE	1. LP-3320(3C94)
GAP	有 <input checked="" type="checkbox"/> 無 <input type="checkbox"/> Test Frequency:50KHz/0.25V
耐壓	初級 ←→ 次級 4KVac 1mA/sec
	初級 ←→ Core 4KVac 1mA/sec
規範	次級 ←→ Core ---KVac mA/sec
	絕緣阻抗 500VDC > 100 MΩ
安規要求	<input checked="" type="checkbox"/> IEC60950-1 CLASS B
修訂	99年06月25日 1.訂正 DC.R值 3.修改說明 2.線高改23.3mm max.
審核	設計 <input type="checkbox"/> 確認 <input type="checkbox"/> 製圖 <input type="checkbox"/>

2004-09-14

10. E Core結合處(Core中心柱)須點軟膠

11. 此料號變壓器不宜列為免驗物料

12. 供應廠商每批均須檢附測試報告

13. 漏電量測時Fly線不與次級端短路

14. Bobbin下方(與PCB接觸處)不可有凡立水夾起膠塊

15. 組裝鐵芯時,層GAP之鐵芯置於次級側

16. N4,N5繞製時採並繞方式繞製

17. PIN腳吃錫要飽滿

18. 所有繞組不可任意更改極性

19. 變壓器初級側鐵芯包覆Tape二層後,Tape不能有凸點產生

20. 次級側Cover不裝於Bobbin上,此移除Cover空間要預留(約>1.6mm)後含浸

明緯企業股份有限公司

廠商編號:
機種:HLG-120H-48

變壓器圖面

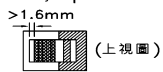
試樣圖面 圖號:TF-2080-R1
 正式圖面 日期:2010-06-25

<p>線路圖(以說明為主)</p>		<p>剖面圖</p>		<p>外觀說明: 非明緯製造請修改為該公司的絕緣系統號碼 捺印如圖示廠商 Logo 及序號</p>							
繞線層次	相位始末	線徑(φ)	圈數(T)	繞線方式	膠帶層數(L)	電感(H)	DC.R(Max.)mΩ	說明	BOBBIN	1. 昱京 LP-3320(Pitch=35mm)	
N1	14-FL1	0.3φ	3	偏密繞	0	6.4~9.6u	75	1. 第 1,4,7 Pin除	CORE	1. LP-3320(3C94)	
N2	3-2	0.3φ	3	偏密繞	0	6.4~9.6u	55	2. 主線圈電感 5-6 Lm=1.9mH~2.1mH	GAP	有 <input checked="" type="checkbox"/> 無 <input type="checkbox"/> Test Frequency:50KHz/0.25V	
N3	5-6	0.1φ ×25	54	密繞	2	2m	330	3. 主線圈漏感 5-6(N4和N5短路) Lk=254uH~272uH	耐壓	初級 ← 次級 4KVac 1mA/sec	
N4	12,13 -9	0.1φ ×90	12	並繞	0	80~120u	24	4. N1繞組繞線於初級,引線至次級PIN腳	初級 ← Core 4KVac 1mA/sec		
N5	8- 10,11	0.1φ ×90	12		0	80~120u	24	5. N1,N2使用三層絕緣線 出線加鐵弗龍套管 6. FL1出線於PIN14旁FL1出線 長10mm,鍍錫10mm,加 黑色套管 7. 所有出線加套管 8. 線材使用155°C等級(2UE+Ny) 9. N4,N5使用0.1φ×90股須 捲成單股繞製,勿分成兩股並繞	次級 ← Core ---KVac mA/sec		
								總線阻抗	500VDC > 100 MΩ		
								安規要求	<input checked="" type="checkbox"/> IEC60950-1 CLASS B		
								修訂	99年06月25日 1.訂正DC.R值 3.N3改×25股 2.層高改23.3mm max. 4.修改說明20		
								審核	設	確	製

- 10. E Core結合處(Core中心柱)須點軟膠
- 11. 此料號變壓器不宜列為免驗物料
- 12. 供應廠商每批均須檢附測試報告
- 13. 漏電量測時Fly線不與次級端短路

- 14. Bobbin下方(與PCB接觸處)不可有凡立水突起膠塊
- 15. 組裝鐵芯時,層GAP之鐵芯置於次級側
- 16. N4,N5繞製時採並繞方式繞製
- 17. PIN腳吃錫要飽滿

- 18. 所有繞組不可任意更改極性
- 19. 變壓器初級側鐵芯包覆Tape二層後,Tape不能有凸點產生
- 20. 次級側Cover不裝於Bobbin上,此移除Cover空間要預留(約>1.6mm)後合浸



明緯企業股份有限公司

廠商編號:

機種: HLG-120H-54

變壓器圖面

試樣圖面

圖號: TF-2081-R1

正式圖面

日期: 2010-06-25

線路圖(以說明為主)

剖面圖

外觀說明: 非明緯製造請修改為該公司的絕緣系統號碼
捺印如圖示廠商 Logo 及序號

繞組層次	相位始末	線徑(φ)	圈數(T)	繞線方式	膠帶層數(L)	電感(H)	DC.R(Max.) mΩ	說明
N1	14-FL1	0.3φ	3	偏密繞	0	6.6~10u	75	1. 第 1,4,7 Pin除
N2	3-2	0.3φ	3	偏密繞	0	6.6~10u	55	2. 主線圈電感 5-6 Lm=2mH~2.2mH
N3	5-6	0.1φ ×25	54	密繞	2	2.1m	330	3. 主線圈漏感 5-6(N4和N5短路) Lk=254uH~272uH
N4	12,13 -9	0.1φ ×80	13	並繞	0	99.6~149.4u	29	4. N1繞組繞線於初級,引線至次級PIN腳
N5	8- 10,11	0.1φ ×80	13		0	99.6~149.4u	29	5. N1,N2使用三層絕緣線 出線加鐵弗龍套管 6. FL1出線於PIN14旁FL1出線長10mm,鍍錫10mm,加黑色套管 7. 所有出線加套管 8. 線材使用155°C等級(2UE+Ny) 9. N4,N5使用0.1φ×80股須捲成單股繞製,勿分成兩股並繞

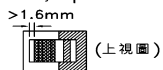
BOBBIN	1. 昱京 LP-3320(Pitch=35mm)
CORE	1. LP-3320(3C94)
GAP	有 <input checked="" type="checkbox"/> 無 <input type="checkbox"/> Test Frequency:50KHz/0.25V
耐壓	初級 ← 次級 4 KVac 1mA/sec
	初級 ← Core 4 KVac 1mA/sec
規範	次級 ← Core ---KVac mA/sec
	絕緣阻抗 500VDC > 100 MΩ

安規要求	<input checked="" type="checkbox"/> IEC60950-1 CLASS B
修訂	99年06月25日 1.訂正 DC.R值 3.修改說明 2.線高改23.3mm max.
審核	設計 <input type="checkbox"/> 確認 <input type="checkbox"/> 製圖 <input type="checkbox"/>

- 10. E Core結合處(Core中心柱)須點軟膠
- 11. 此料號變壓器不宜列為免驗物料
- 12. 供應廠商每批均須檢附測試報告
- 13. 漏電量測時Fly線不與次級端短路

- 14. Bobbin下方(與PCB接觸處)不可有凡立水夾起膠塊
- 15. 組裝鐵芯時,層GAP之鐵芯置於次級側
- 16. N4,N5繞製時採並繞方式繞製
- 17. PIN腳吃錫要飽滿

- 18. 所有繞組不可任意更改極性
- 19. 變壓器初級側鐵芯包覆Tape二層後,Tape不能有凸點產生
- 20. 次級側Cover不裝於Bobbin上,此移除Cover空間要預留(約>1.6mm)後含浸



TEST RECORD NO. 3

SAMPLES:

Samples of Power supply Model HL-100-20 and HL-100-54 as indicated below and constructed as described herein, were submitted by the manufacturer for examination and test.

GENERAL:

No testing was considered necessary to update the file description with the "Type HL" mark option due to engineering considerations and the units being fully potted. Also, no testing was considered necessary to add the alternate leads since the leads possess similar ratings as described herein.

Test Record Summary:

The results of this investigation indicate that the products evaluated comply with the applicable requirements and below Standards, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Latest Revision Date
UL 8750	Light Emitting Diode (LED) Light Sources for Use in Lighting Products	1 st	2015-04-01
CSA C22.2 No. 250.13-12	LIGHT EMITTING DIODE (LED) EQUIPMENT FOR LIGHTING APPLICATIONS	1st Edition	2012-01-01
UL 1310	Class 2 Power Units	6 th	2014-12-12
CSA C22.2 no. 223	Power Supplies with Extra low voltage class 2 outputs	Edition 2	2009-09-01

Test Record by:

Nazir Gouhary

Staff Engineer

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.