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REPORT

on

COMPONENT - DRIVERS FOR LIGHT-EMITTING-DIODE ARRAYS, MODULES AND CONTROLLERS

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GUANGDONG, CHINA

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DESCRIPTION

PRODUCT COVERED:

USL, CNL- LED Driver, see electrical ratings table for models.

ELECTRICAL RATINGS:

Model No.	Input, Max				Output, Max - CV		
	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Voltage (Vdc)	Current (A)	Power (W)
VGM0PPW-12-EVL-YYYYY-ZZZZZ	120/277	60	0.7	68	12	5.0	60
VGM0PPW-12-ELE-YYYYY-ZZZZZ							
VIM0PPW-12-YYYYY-ZZZZZ							
VGMPPPW-24-EVL-YYYYY-ZZZZZ	120/277	60	1.1	107	24	4.0	96
VGMPPPW-24-ELE-YYYYY-ZZZZZ							
VIMPPPW-24-YYYYY-ZZZZZ							

Where PP=60 if output power (50 W ≤ output power ≤ 60 W)
 PP=50 if output power (40 W ≤ output power < 50 W)
 PP=40 if output power (30 W ≤ output power < 40 W)
 PP=30 if output power (20 W ≤ output power < 30 W)
 PP=20 if output power (10 W ≤ output power < 20 W)

Where PPP=100 if (90 W ≤ output power < 100 W)
 PPP=090 if (80 W ≤ output Power < 90 W)
 PPP=080 if (70 W ≤ output power < 80 W)
 PPP=070 if (60 W ≤ output power < 70 W)
 PPP=060 if (50 W ≤ output power < 60 W)

"YYYYY", "ZZZZZ" may be any combination of 2 - 5 digit alphanumeric characters or blank - denoting internal code.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

USL - Indicates investigation to the United States Standards for Light Emitting Diode (LED) Light Equipment for Use in Lighting Products, UL 8750.

CNL- Indicates investigation to the Canadian Standard for: Light emitting Diode (LED) Equipment for Lighting Applications, CAN/CSA-C22.2 No. 250.13.

These devices were additionally investigated to UL 2097, Reference Standard for Double Insulation Systems for Use in Electronic Equipment and CSA C22.2 No. 0.1, General Requirements for Double-Insulated Equipment.

DIFFERENCES BETWEEN MODELS:

1. All products under each series utilize the same PWB design, enclosure constructions and input/output connection scheme (via power supply cord). The different output power levels are achieved by means of changes in component values of Resistor, R70 located in secondary circuit.

2. Model VIM0PPW-12-YYYYY-ZZZZZ and VIMPPPW-24-YYYYY-ZZZZZ are similar to Model VGM0PPW-12-EVL-YYYYY-ZZZZZ and VGMPPPW-24-EVL-YYYYY-ZZZZZ respectively except the housing appearance.

3. Models with suffix "EVL" is identical to models with suffix "ELE" except different type of attachment plug.

Product characteristics-

1.

				Additionally evaluated to UL 8750 Supplements noted below:						
Model No.	Input type	Output type	Rated for	[] SA-SRE C	[] SB-Type HL	[] SC-Type TL	[] SE-Class P	[] SF-Wired control Circuits(c)	[X] SG-Temperature value @ Tc	[] SH-Phase cut dimming
Applies to all models-see electrical ratings	Branch Circuit Mains	Class 2 (a) LED Class 2 (b)	Damp	--	--	--	--	--	Tref max-Tc 90 ° C	--

a- As defined in UL 8750, Clause 7.12.1 and CAN/CSA-C22.2 No. 250.13, Clause 8.12

b- As defined in CAN/CSA-C22.2 No. 250.13, Annex A

c- Supplement SF has a future effective date: 2020-05-01

2. These products have been evaluated as stationary devices.

CONSTRUCTION DETAILS:


Corrosion Protection - Ferrous metal parts are protected against corrosion by plating or painting.

Soldered Connections - All soldered connections are mechanically secured before soldering.

Printed Wiring Boards - Suitable for the solder time and temperature used by the manufacturer.

"CN" under the CCN column in the component description tables indicates that the component meets applicable Canadian requirements for the component. Such components will either have a UL certification Mark for Canada (C-UL) or a CSA certification Mark. "CN" is always noted in conjunction with the CCN indicating UL Certification per applicable US requirements for the component.

Product identification, ratings & markings noted below are to be provided on the product. See comment area for cases where some of this information can be provided on a separate specification sheet, installation instruction or the like.

	Description	Comment
x	Company name (as identified in Online directory) or File number	-
X	Model designation-	-
x	Factory ID, when more than one factory	-
X	Date Code	-
X	Class 2 outputs	See product characteristics table- 'Class 2' marked on the device.
X	Electrical Ratings	See electrical ratings table- note 1
X	Input Type	See product characteristics table- note 1
X	Output Type	See product characteristics table- note 1
X	Environmental considerations	See product characteristics table- note 1
X	Polarity of supply connections	Applies to [X]Input, [X] Output- note 1
X	Temperature Measurement Point (Tc)	See product characteristics table- Tc point location marking on device. The Tref max values may be marked on the device in the following format: 90 °C. This information may alternately appear in a specification sheet. The Test Measurement Point Tc is "Housing, outside, top, above transformer, T1"
X	Double Insulation	"DOUBLE INSULATION", "DOUBLE INSULATED" or symbol: 
X	Stationary use	The installation instructions contain the following information: - Product is intended for stationary use

Note 1- For built in products this marking may be included on a separate specification sheet, installation instruction or the like.

LED Driver, Model VGM060W-12-EVL - FIGS. 1-3

General - FIG. 1 show overall views; FIG. 2 shows internal view; FIG. 3 show the circuit board. Description below represents all VGM060W-12-EVL-YYYYY-ZZZZZ series models unless specifically noted otherwise.

1. Power-supply Cords- Listed (ELBZ, CN), Type SJT, SVT or SJTW, min. 18 AWG x 3C, min. 300 V, min. 90 °C, min. 1.5 m. One end of L-N conductors terminates to PWB; One end of grounding conductor directly connected to the end-cap of metal enclosure, secured by screw and nut. Other end of all three conductors terminates in a NEMA 5-15P plug, rated current is at least 125% of the input rating of the product covered in this report.
2. Output Cord - R/C (AVLV2,CN), rated min. 300 V, min. 105°C, min. 18 AWG x 2C. One end is soldered to PWB, the other end is terminates in a male connector.
3. Enclosure - Four piece aluminum construction consisting of cover, extruded housing and two end-caps. Mounting tabs are provided in end-caps. Overall 170 mm by 44 mm by 27 mm (L x W x H), 0.51 mm thick min. See ILL. 1 for detailed dimensions.
4. Insulating Liner - R/C (QMFZ2), CN, PET film, rated VTM-2 min., 105°C min., 0.18 mm thick min. Potting Compound was provided between the PWB solder side and metal chassis to protect the sheet from being punctured. Min. 1 layer of Insulating Tape (Item 5) applied on the Liner. See ILL. 2 for detailed dimensions and FIG. 9 for reference.
5. Insulating Tape - R/C (OANZ2), 3M COMPANY ELECTRICAL MARKETS DIV (EMD) (E17385), type 1350T-1 (b), PET film, 0.05 mm thick, rated 130°C. Fully wrapped on Insulating Liner (item 4).
6. Potting Compound - R/C (QMFZ2), CN, DONGGUAN ZHAOSHUN SILICONE TECHNOLOGY CO LTD. (E329120), silicone, type ZS-GF, rated V-0, 150°C. Fully covered all components inside enclosure.
7. Printed Wiring Board (PWB) - R/C (ZPMV2), CN, rated min. V-1, 105°C, suitable for direct support of live parts. See ILL. 3 for parts/trace layouts (not to scale). Overall dimensions approximately 152mm x 22mm, 1.6 mm thick.
8. Fuse (F1) - Listed, CN, rated 300 VAC, 6.3 A, soldered in series with ungrounded supply of PWB.

Alternate - Same as above except R/C (JDYX2), CN, COOPER BUSSMANN LLC(E19180), cat. no. SS-5H.

9. X-Capacitor (C1) - R/C (FOWX2), CN, across-the-line, rated 0.1 μ F, min. 305 V.
10. Opto-isolators (IC4,IC7)- R/C (FPQU2), CN, each rated 5000 V isolation voltage.
11. Y-Capacitor (C29) - R/C (FOWX2), CN, Class Y1, rated 1000 pF, 250 V min., 125°C min
12. Varistors (MV3-MV5) - 3 provided. R/C (VZCA2), CN, SPD type 5, each rated operating voltage 277 V ac min., 105°C min.
13. Bridge rectifier (D1) - type no. SDB157L, rated 1kV, 1.5A.
14. Film capacitors (C2,C3) - Each rated 450V, 0.22 μ F. C2: soldered 10 mm from PWB with pins fully insulated by Tubing.
15. Tubing - R/C (YDPU2), CN, rated 300 V, 125°C minimum.
16. Electrolytic cap (C9) - Rated min. 450V, 22 μ F, min. 105°C.
17. Electrolytic cap (C35) - Rated min. 16V, 1000 μ F, min. 105°C.
18. MOSFET (Q3) - SMD. Type no. SWD13N65K2. Rated 650V, 13A.
19. Diode (D5) - SMD. Type no. STTH3L06S. Rated 600V, 3A.
20. MOSFET (Q6,Q7) - SMD. Type no. SWD5N65K. Rated 650V, 5A.
21. IC (IC5) - SMD. Type no. MP6924GS. Consists of 8 pins.
22. MOSFET (Q10,Q11) - SMD. Type no. STL140N6F7. Rated 60V, 140A.
23. Daughter PWB - See FIG.4 for details.

24. Winding devices - See below for details.

Ring Coil (L4) - Open type, rated 8.0 μ H, constructed as follows:

Core: Ferrite core. Overall 6.0mm OD. x 3.0mm ID. x 3.0 mm thick.

Coil (N1): Enameled copper wire, rated 130°C min.

N1: 0.3 mm dia. x 6T x 1P.

Coil (N2): Insulated winding wire, R/C (OBJT2), type TIW, rated 130°C min.

N2: 0.3 mm dia. x 6T x 1P.

Ring Coil (L1) - Open type, rated 25.2mH, constructed as follows:

Core: Ferrite core. Overall 14.0mm OD. x 8.0mm ID. x 7.0 mm thick.

Coils (N1, N2): Enameled copper wire, rated 130°C min. Each coil separated by phenolic divider, 0.8 mm thick. Fully covered with 0.1 mm thick insulating tape, R/C (OANZ2), rated 130°C.

N1: 0.4 mm dia. x 60T x 1P.

N2: 0.4 mm dia. x 60T x 1P.

Ring Coil (L2) - Open type, rated 1.26mH, constructed as follows:

Core: Ferrite core. Overall 12.7mm OD. x 7.62mm ID. x 4.75 mm thick.

Coil (N1): Enameled copper wire, rated 130°C.

N1: 0.32 mm dia. x 150T x 1P.

Inductor (L3) - Open type, rated 750 μ H, constructed as follows:

Core: Ferrite core. Overall 20mm x 14mm x 11.4mm.

Coil (N1, N2): Enameled copper wire, R/C (OBMW2), rated 130°C min.

N1: 0.10 mm dia. x 85T x 1P.

N2: 0.15 mm dia. x 10T x 1P.

Bobbin: Phenolic, 0.71 mm thick minimum.

Ring Coil (L7) - Open type, rated 6.3 μ H, constructed as follows:

Core: Ferrite core. Overall 8.0mm OD. x 4.0mm ID. x 4.0 mm thick.

Coil (N1): Enameled copper wire, rated 130°C.

N1: 0.6 mm dia. x 5T x 1P.

Coil (N2): Insulated winding wire, R/C (OBJT2), rated 130°C min.

N2: 0.6 mm dia. x 5T x 1P.

Transformer (T1) - R/C (OBJY2), Class B (130) Insulation System, ENERGY RECOVERY PRODUCTS (ZHUHAI) CO. LTD. (E472467), Type ERP-130 (Table IV). Completely wrapped by 2 layers of tape. Constructed as follows:

Core - Ferrite, overall 20mm x 14mm x 11.4mm. Wrapped with 2 layers of insulation tape to provide required spacing of 19 mm through air/ 25.4 mm over surface between Secondary Pins to Core. Core is considered as primary.

Bobbin - Two flange bobbin, minimum 0.71 mm thick, R/C (QMFZ2), Sumitomo Bakelite Co. Ltd. (E414429), Type PM-9820, rated V-0, 150°C. Wrapped with 2 layers of insulation tape prior to coil winding.

Windings - Layer wound. Enameled copper magnet wire for primary/secondary windings, R/C (OBMW2), MW75, rated 130°C. See Tubing, for primary crossover lead insulation. See table below for details.

Insulation Tape - R/C (OANZ2), 3M COMPANY ELECTRICAL MARKETS DIV (EMD) (E17385), Type 1350T-1, rated 130°C, minimum 0.05 mm thick per layer. Min. 0.8mm bent-up on bobbin to provide required spacing of 19 mm through air/ 25.4mm over surface between Primary and Secondary windings.

Tubing - R/C (YDFU2), GREAT HOLDING INDUSTRIAL CO LTD (E156256), Type TFT, rated 300 V, 200°C, VW-1. Served as crossover lead insulation.

Varnish - R/C (OBOR2), SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD (E228349), Type T4260(a), rated 130°C.

Coil: No. of turns x Diameter (mm) x no. of Conductors	ILL. No.
Transformer (T1)	
N1: 62 x 0.20 x 1 N2: 5 x 0.15 x 1 N3A, N3B: 7 x 0.1 x 1 N4: 5 x 0.15 x 1	4

Daughter board for all models - FIG. 4

1. Printed Wiring Board (PWB) - R/C (ZPMV2), CN, rated min. V-1, 105°C, suitable for direct support of live parts. See ILL. 5 for parts/trace layouts (not to scale). Overall dimensions approximately 36mm x 12mm, 1.0 mm thick.
2. IC (IC2) - SMD. Type no. MP44014GS-Z. Consists of 8 pins.
3. IC (IC3) - SMD. Type no. HR1001B-C859. Consists of 16 pins.
4. MOSFET (Q5) - SMD. Type no. MMBTA06-TP. Rated 80V, 500mA.
5. MOSFET (Q19) - SMD. Type no. 2N7002W-TP. Rated 60V, 115mA.
6. Diode (D7,D8,D9,D17) - SMD. Type no. 1N4148WS. Rated 100V, 0.15A.
7. Chip capacitors (C11,C12,C23,C25) - SMD. Each rated 25V, 10µF.

LED Driver, Model VGM100W-24-EVL

General - Model VGM100W-24-X01 is identical to model VGM100W-12-X01 except as noted below. Also represents all models in VGMPPPW-24-EVL-YYYYY-ZZZZZ series.

6. Fuse (F1) - Listed, CN, rated 300 VAC, 2.0 A, soldered in series with ungrounded supply of PWB.

Alternate - Same as above except R/C (JDYX2), CN, COOPER BUSSMANN LLC (E19180), cat. no. SS-5H.

15. Electrolytic cap (C35) - Rated min. 35V, 120 μ F, 105°C. Electrolytic cap (C35) - Rated min. 35V, 120 μ F, 105°C.

16. MOSFET (Q10,Q11) - SMD. Type no. D115N10E. Rated 100V, 115A.

23. Winding devices - See below for details.

Inductor (L3) - Open type, rated 580 μ H, constructed as follows:

Core: Ferrite core. Overall 20mm x 14mm x 11.4mm.

Coil: N1,N2 - Enameled copper wire, R/C (OBMW2), rated 130°C min.

N1: 0.10 mm dia. x 85T x 1P.

N2: 0.15 mm dia. x 10T x 1P.

Bobbin: Phenolic, 0.71 mm thick minimum.

Ring Coil (L7) - Open type, rated 16.32 μ H, constructed as follows:

Core: Ferrite core. Overall 8.0mm OD. x 4.0mm ID. x 4.0 mm thick.

Coil (N1): Enameled copper wire, rated 130°C.

N1: 0.5 mm dia. x 8T x 1P.

Coil (N2): Insulated winding wire, R/C (OBJT2), rated 130°C min.

N2: 0.5 mm dia. x 8T x 1P.

LED Driver, Model VGM060W-12-ELE, VGM100W-24-ELE - FIGS. 5

General - Model VGM060W-12-ELE and VGM100W-24-ELE are identical to model VGM060W-12-EVL and VGM100W-24-EVL respectively except as noted below. Also represents all models in VGM0PPW-12-ELE-YYYYY-ZZZZZ and VGMPPW-24-ELE-YYYYY-ZZZZZ series.

1. Power-supply Cords- Listed (ELBZ, CN), type SJT, SVT, SJTW, min. 18 AWG x 2C, min. 300 V, min. 90 °C, min. 1.5 m. One end terminates to PWB; the other end terminates in a NEMA 1-15P plug, rated current is at least 125% of the input rating of the product covered in this report.

LED Driver, Model VIM060W-12, VIM100W-24 - FIGS. 6-9

General - FIG. 6 show overall views; FIG. 7-8 shows the enclosure; FIG. 9 show the internal view. Model VIM060W-12 and VIM100W-24 are identical to model VGM060W-12-EVL and VGM100W-24-EVL respectively except as noted below. Also represents all models in VIM0PPW-12-YYYYY-ZZZZZ and VIMPPPW-24-YYYYY-ZZZZZ series.

3. Enclosure - Four piece aluminum construction consisting of cover, extruded housing and two end-caps. Mounting tabs are provided in end-caps. Overall 170 mm by 44 mm by 27 mm (L x W x H), 0.51 mm thick min. See ILL. 6 for detailed dimensions.