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REPORT

on

Light-emitting-diode Drivers

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Guangdong, China

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DESCRIPTION

PRODUCT COVERED:

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

ELECTRICAL RATINGS:

Model No.	Rated Input			Rated Output [] CC [X] CV		
	Voltage Vac	Frequency (Hz)	Current (A) / Power (W)	Voltage Vdc	Current (A)	Power (W)
VZMPPA-CC- YYYYY-ZZZZZ	120/277	50/60	0.84A/100W	48	3.75	90
JVZMPPA-CC- YYYYY-ZZZZZ	120/277	50/60	0.84A/100W	48	3.75	90

Where:

"J" - Denotes for customer identification.

"PP" - Denotes output power code. If $55W < P_{out} < 65W$, "PP"=60; if $85W < P_{out} \leq 90W$, "PP"=100.

"A" - Denotes input voltage code. If input rated 120/277Vac, "A"=W; if input rated 120Vac, "A"=U; if input rated 277Vac, "A"=V

"CC" - Denotes maximum output voltage which is not greater than max output voltage (48V).

"YYYYY" - Denotes customer code for market purpose only. It could be blank, 2digits or 3 digits or 4 digits or 5 digits, any combination of alphanumeric characters or blank.

"ZZZZZ" - Denotes customer code for market purpose only. It could be blank, 2digits or 3 digits or 4 digits or 5 digits, any combination of alphanumeric characters or blank.

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.

DIFFERENCES BETWEEN MODELS:

Location	VZM100W-24	VZM100W-48	VZM60W-24	VZM60W-48
R80	RES,0603,1K,1%	RES,0603,1K,1%	RES,0603,2K,1%	RES,0603,2K,1%
R49,R52	RES,0603,10K,1%	/	RES,0603,10K,1%	/
R47,R50,R51	RES,0603,10-OHM,1%	/	RES,0603,10-OHM,1%	/
R87	RES,0402,9.09K,1%	/	RES,0402,9.09K,1%	/
R142	RES,0402,240K,1%	/	RES,0402,240K,1%	/
R86	RES,1206,0.02-OHM,1%,1W	RES,1206,0.05-OHM,1%,1/2W	RES,1206,0.02-OHM,1%,1W	RES,1206,0.05-OHM,1%,1/2W
R44	RES,0402,1.47K,1%	RES,0402,2.74K,1%	RES,0402,1.47K,1%	RES,0402,2.74K,1%
R80	RES,0402,1.82K,1%	RES,0402,1.74K,1%	RES,0402,1.82K,1%	RES,0402,1.74K,1%
R54	RES,1206,10K,1%,1/2W	RES,1206,15K,1%,1/2W	RES,1206,10K,1%,1/2W	RES,1206,15K,1%,1/2W
R114	RES,0402,1K,1%	RES,0402,2.55K,1%	RES,0402,1K,1%	RES,0402,2.55K,1%
R113	RES,0402,4.87K,1%	RES,0402,2.49K,1%	RES,0402,4.87K,1%	RES,0402,2.49K,1%
R150	RES,0805,4.75K,1%	RES,0805,0-OHM,1%	RES,0805,4.75K,1%	RES,0805,0-OHM,1%
R55	RES,0402,2K,1%	RES,0402,1.58K,1%	RES,0402,2K,1%	RES,0402,1.58K,1%
R151	RES,0603,4.53K,1%	RES,0603,4.22K,1%	RES,0603,4.53K,1%	RES,0603,4.22K,1%
R38	RES,0402,75-OHM,1%	RES,0402,200-OHM,1%	RES,0402,75-OHM,1%	RES,0402,200-OHM,1%
R29	RES,0402,9.09K,1%	RES,0402,8.06K,1%	RES,0402,9.09K,1%	RES,0402,8.06K,1%
R56,R60	RES,0402,4.99K,1%	RES,0402,10K,1%	RES,0402,4.99K,1%	RES,0402,10K,1%

Product characteristics-

Model No. [x] applies to all models- see electrical ratings	Input Type	Branch Circuit (Mains)	
	Output Type	Class 2 (a) LED Class 2 (b)	
	Environmental Conditions	Damp	
	Additionally evaluated to UL 8750 Supplements	[X] SA- SREC	[X]- Evaluation per SA 3.2, 3.3 for overtemperature protection []- Evaluation per SA 4
		[] SB- Type HL	
		[] SC- Type TL	Tref max/ Measured Tref- xx/ yy ° C
		[X] SE- Class P	
		[X] SF- Wired control Circuits(c)	[X] Isolated []- Not Isolated
		[X] SG- Temperature value @ Tc	90 ° C
		[] SH- Phase cut dimming	
		[] SI- Type IC LED driver	

a- As defined in UL 8750, Clause 7.12.1

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

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

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.

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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	Environmental considerations	See product characteristics table- §
X	Input supply limitations (e.g. Class 2 input only)	See product characteristics table- §
X	Electrical Ratings	See electrical ratings table- §
X	Input & Output Types	See product characteristics table- §
x	Class 2 outputs	See product characteristics table- 'Class 2' marked on the device. WARNING - Risk of Fire or Electric Shock. Do not interconnect output terminations #
x	Polarity of supply connections	Applies to Input, Output- §
x	Product information provided an instruction sheet	Where product information is permitted to be provided on an instruction sheet, as an alternative, this information can be provided via a publicly accessible web site if the equipment is marked as follows; See (specific URL inserted here) for additional supporting information for this product.
x	Class P LED drivers	See product characteristics table- optional marking 'Class P' on LED driver. If marking is provided, then the LED driver is marked "For Connections Use Wire Rated for at Least 90°C (194°F)" or equivalent. Device marked 'Use only within an enclosure'
x	Wired Control Circuits	See product characteristics table- 1. Identification of the terminals or lead wires for control circuits - § 2. Identification of the intended industry or proprietary protocols- § 3. Installation instructions 4. Device wired control circuit marked 'Class 2'
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- §

x- Denotes applicable product markings

§- For Components (built-in products) this information may be provided on the product, or on an instruction sheet or the like.

#- For products with the UL Mark for Canada, this marking is also provided in French.

Model VZM100W-24 - FIG. 1 - 5

General - The general design, shape and arrangement shall be as illustrated except where variations are specifically described.

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
1	Enclosure (Plastic part)	QMFZ2, QMFZ8	E I DUPONT DE NEMOURS & CO INC (E41938) ()	FR530(l)(+)(fl)	CASE-BACK COVER,NFC,PLASTIC,FOR 2.5MM-THICK CASE,BLACK PET, 2.5 mm thick min. Rated 5VA 155C (HWI 0, HAI 1, CTI 2). Secured to Enclosure by snap fit. See ILL.1 (unit:mm) for detailed dimension.	I1
2	Enclosure (Metal part)	N/A	N/A	N/A	Cast aluminum alloy, 2.5 mm thick min. Two-part construction. Secure together by screws. See ILL. 2 (unit:mm) for detailed dimension. Provided with silicone rubber bushing for lead out.	I2
3	Insulation Liner	QMFZ2, QMFZ8	Various	Various	PET film, 0.18 mm thick minimum, 105 Part construction. Folding edges at two ends secured by One layer of Tape (item 6). Provided as insulation between PWB assembly and metal enclosure. See ILL. 3 (unit:mm) for detailed dimension.	I3
4	Tape	OANZ2, OANZ8	Various	Various	PET tape, 0.05 mm thick per layer. Rated 105 C min. Applied on insulation liner.	
5	Input/Output Lead Wire	AVLV2, AVLV8	Various	Various	18 AWG, rated 300V, 105 C, min. 152 mm long	
6	Dimming Lead Wire	AVLV2, AVLV8	Various	Various	22 AWG, rated 300 V, 105 C, min. 152 mm long.	
7	Functional Ground	AVLV2, AVLV8	Various	Various	26 AWG, rated 300 V, 105 C, , Soldered on PWB and directly connected to metal enclosure.	
8	Potting Compound	QMFZ2, QMFZ8	DONGGUAN ZHAOSHUN SILICONE NEW MATERIAL TECHNOLOGY CO LTD (E329120)	ZS-GF Series	Silicone. Rated V-0, 150°C, Fully covered all the components inside housing.	
8.1	Alternate Potting Compound	QMFZ2, QMFZ8	Shenzhen City Jia Di New Materials Co., Ltd.(E485392)	JD-505	Silicone Rubber (SIR). Fills the case so to completely cover all electrical components and the circuit board. RTI 150 C.	

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No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
Main Board						
1	Printed Wiring Board	ZPMV2, CN	Various	Various	Rated min. V-1, 130 C. Suitable for support of live parts. See ILL. 4 for trace layouts.	I4
2	Fuse (F1)	JDYX2, CN	CONQUER ELECTRONICS CO LTD (E82636)	MST	Rated 300 V, 2 A, connected in series with ungrounded supply.	
2.1	Alternate	JDYX, CN	Various	Various	Same as above.	
3	Capacitor (C1)	FOWX2, CN	Various	Various	Type X2, rated 310 V min., 110 C min, 0.15 uF max. Located across the line.	
4	Varistor (MV1,MV2)	VZCA2, CN	Various	Various	SPD Type 5, minimum voltage rating 300 Vac, minimum temperature rating 105°C.	
5	Thermistor (RT3)	XGPU2, CN	Various	Various	Rated 3 A, 10 Ω at 25 C, max. Operating temperature 170 °C min	
6	Capacitor (C117)	FOWX2, CN	Various	Various	Type Y1, rated 400 V min., 110 C min, 2200 pF max. Located Primary to Ground.	
7	Capacitor (C104)	FOWX2, CN	Various	Various	Type Y1, rated 400 V min., 110 C min, 680 pF max. Bridging Primary to secondary.	
8	Flying Leads	OBJT2	Various	Various	Insulated Winding Wire, 130°C min. Connect PWB location C104A to Capacitor (C104).	
9	Y-Capacitor (C38)	FOWX2, CN	Various	Various	Type Y1, rated 5K V min., 110min, 1000 pF max. Located Secondary to Ground.	
10	Optical Isolator (IC4)	FPQU2, CN	Various	Various	Rated Isolation voltage 3.75 kV min., with minimum operating temperature 110 °C	
11	Electrolytic Capacitor (C9, C55)	N/A	N/A	N/A	Rated 22uF, 350V, 130C Provided with Phenolic stand, 20 mm by 7.5 mm by 5 mm high	
12	Thermal Pad	QMFZ2, QMFZ8	Various	Various	Made by Silicon Rubber, Two provided. Located on the top of C9 & C55 overall measured 20 mm by 20 mm, 3.5 mm thick. Located on the top of L3 overall measured 18 mm by 20 mm, 3.5 mm thick.	
13	Electrical Tubing	YDPU2, CN	Various	Various	Rated min. 300 V, 125 C. Covered the pigtail lead of C3, Z3, R104, C35	
14	Tape	OANZ2	Various	Various	PET tape, 0.05 mm thick per layer. Rated 105 C min.. Two layers provided for outer wrap of C104 and C35.	
15	SREC - Over temperature Protection	N/A	N/A	N/A	See Page 10 for details.	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F)IG (I)LL
1	Line Filter (L4)				Rated 14.4uH	
1.1	Core	N/A	N/A	N/A	Ferrite, ring type, 7 mm OD by 4 mm high	
1.2	Coil (N1, N2)	OBJT2	Various	Various	Enamel copper wire, 130 C min. N1: 0.8 mm dia x 8 turns N2: 0.8 mm dia x 8 turns	
2	Line Filter (L1)				Rated 34.3mH	
2.1	Core	N/A	N/A	N/A	Ferrite, ring type, 14 mm OD by 8 mm high	
2.2	Coil (N1, N2)	OBMW2	Various	Various	Enamel copper wire, 130 C min. N1: 0.3 mm dia x 70 turns N2: 0.3 mm dia x 70 turns	
2.4	Bobbin	QMFZ2	Various	Various	Phenolic, 0.75 mm thick minimum. Locate at the center of Core.	
2.5	Tape	OANZ2	Various	Various	PET tape, 0.025 mm thick per layer, 1 layers provided for outer wrap.	
3	Line Filter (L2)				Rated 1.85mH	
3.1	Core	N/A	N/A	N/A	Ferrite, ring type, 15.24 mm OD by 5.94 mm high	
3.2	Coil (N1)	OBMW2	Various	Various	Enamel copper wire, 130 C min. N1: 0.35 mm dia x 193 turns	
3.3	Tape	OANZ2	Various	Various	PET tape, 0.025 mm thick per layer, 1 layers provided for outer wrap.	
4	Line Filter (L3)				Refer to Ill. 5 for details	I5
4.1	Bobbin	QMFZ2	Various	Various	Phenolic, 0.71 mm thick minimum.	
4.2	Core	N/A	N/A	N/A	Ferrite, 21 by 22 by 12.5 mm overall	
4.3	Coil (N1, N2)	OBMW2	Various	Various	Enamel copper wire, 130 C min., windings separated from each other by bobbin	
4.4	Bobbin	QMFZ2	Various	Various	Phenolic, 0.75 mm thick minimum.	
4.5	Tape	OANZ2	Various	Various	PET tape, 0.025 mm thick per layer, 1 layers provided for outer wrap.	

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F)IG (I)LL
5	Line Filter (L7)				Rated 3.8 uH	
5.1	Core	N/A	N/A	N/A	Ferrite, ring type, 8 mm OD by 4 mm high	
5.2	Coil (N1, N2)	OBMW2	Various	Various	Enamel copper wire, 130 C min. N1: 0.5 mm dia x 4 turns N2: 0.5 mm dia x 4 turns	
6	Transformer (T1)	-	-	-	Refer to Ill. 6 for details. Manufactured by the manufacturer in item 6.0.	I6
	Electrical Insulation System for T1	OBJY2	ENERGY RECOVERY PRODUCTS (ZHUHAI) CO LTD (E472467)	ERP-155	Class 155(F). Table V.	
6.1	Core	-	-	-	Ferrite, 22 by 24 by 12.5 mm overall. Wrapped by Tape (item 6.4) to provide spacing between windings to Core.	-
6.2	Bobbin	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	Sumikon PM- 9630	Phenolic, 0.71 mm thick minimum, rated V-0, 150 °C. Three-flange type. Min. 0.8 mm bent-up tape on bobbin provided spacing between primary and secondary windings.	-
6.3	Primary and Secondary Winding (N1, N2, N3, N4)	OBMW2	Various	Various	ANSI type MW79/80/82/83. Rated min. 155°C.	-
6.4	Triple Insulated Wire	OBJT2	NEW ENGLAND WIRE TECHNOLOGIES CORP (E205791)	WaaDcccFxxxxxx xxxxxx+	Triple insulated wire, rated 155C. Flying leads.	-
6.5	Tape	OANZ2	3M COMPANY ELECTRICAL MARKETS DIV (EMD) (E17385)	1350F-1 (b)	PET tape, 0.025 mm thick per layer, 2 layers provided.	-
6.6	Primary Crossover Lead Insulation	OANZ2	3M COMPANY ELECTRICAL MARKETS DIV (EMD) (E17385)	1350F-1 (b)	Min. 2 layer tape (ITEM 6.6) provided.	-
6.7	Tubing	YDPU2, CN	GREAT HOLDING INDUSTRIAL CO LTD (E156256)	TFT	Rated min. 300 V, 200 C, min. Provided at leads out	-
6.8	Varnish	OBOR2	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD (E228349)	T-4260(a)	Rated 130 °C min. Suitable for ANSI type MW28/80/76.	-

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
Daughter Board I						
1	Printed Wiring Board	ZPMV2, CN	Various	Various	Rated min. V-1, 130 C. Suitable for support of live parts. See ILL. 7 for trace layouts.	I7
2	Optical Isolator (IC6, IC8, IC21)	FPQU2, CN	Various	Various	Rated Isolation voltage 3.75 kV min., with minimum operating temperature 110 °C	
3	IC1	-	BCD	AS321KTR-E1	IC, SOT23-5, AS321K	
4	IC2	-	MPS	MP44014GS-Z	IC, 2101-SO8-MP44014GS-Z	
5	IC3	-	MPS	HR1001BGS-C859-Z	IC, SO16, RESONANT, HR1001B-C	
6	IC14	-	YAGEO	CC0603KRX7R9BB472	IC, CPU, STM32L021D4P7, TSSOP14	
7	IC11, IC18	-	DIODES INC	LM2904AM8-13	IC, miniSO-8, OPAMP DUAL, LM2904A	
8	IC12	-	BCD	AS331KTR-G1	IC, SOT23-5, AS331K	
9	IC22	-	INFINEON	CDM10VD3XTSA1	IC, SOT23-6, DIM-PWM CDM10V	
10	Internal Lead Wire	AVLV2, CN	Various	Various	Min. 24 AWG X 2, rated min. 30 V, min. 105 °C, 48 mm long. Connected to Daughter board II. Completely enclosed in Housing. Not subject to movement.	
Daughter Board II						
1	Printed Wiring Board	ZPMV2, CN	Various	Various	Rated min. V-1, 130 C. Suitable for support of live parts. Secured below Enclosure (Plastic part) by mechanical fit. See ILL. 8 for trace layouts.	I8

SAFETY-RELATED ELECTRONIC CIRCUITS - Abnormal Over Temperature Protection

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F)IG (I)LL
1	Thermistor (RT1)	XGPU2, CN	Thinking Electronic Industrial Co., Ltd(E138827)	SCK-103	Rated 10ohm, 3A, max. surface temperature 170°C	-
2	Capacitor (C94, C95, C19, C22, C111)	-	Various	Various	SMD type. C19: rated 25 V, 0.47 uF. C94, C95: rated 25V, 0.1 uF.	-
3	Resistor (R68, R69, R83)	-	Various	Various	SMD type. Rated 10k ohm, 1/16 W.	-
4	IC (IC14)	XAAZ2	STMICROELECTRO NICS SRL(E480533)	STM32L0	SMD type. Class B.	-