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REPORT

on

Listed - Drivers for Light-emitting-diode Arrays, Modules and Controllers

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DESCRIPTION

PRODUCT COVERED:

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

ELECTRICAL RATINGS:

Model No.	Input [] CC [x] CV					Output [x] CC [] CV		
	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	PF	Max. Voltage (Vdc)	Max. Current (A)	Max. Power (W)
PSBPPW-XXXX-VV-YYYYY-ZZZZZ	120/277	50/60	0.5	60	>0.9	85	1.4	50.4/47.6/46.8 #

- For suffix VV ≤42, the Max power is 50.4W;
 For 42< suffix VV ≤56, the max power is 47.6W;
 For 56< suffix VV ≤85, the max power is 46.8W;

Where "PP"- If Pout<11W, "PP"=10; if 11W≤Pout≤15W, "PP"=15; if 15W<Pout≤20W, "PP"=20; if 20W<Pout≤30.6W, "PP"=30; if 30.6W<Pout≤40W, "PP"=40; if 40W<Pout≤50.4W, "PP"=50.

"XXXX" - Denotes regulated output current. Regulated output current is not greater than max output regulated current within the output voltage range.

"VV" - Denotes maximum output voltage(in voltage) which is not greater than max output voltage range.

"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.

DIFFERENCES BETWEEN MODELS:

All products covered in this report utilize the same PWB design, enclosure constructions and input/ output connection scheme. The different output voltages and power levels are achieved by means of changes the program of IC14 through connector on the product and matched software.

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.

For models with suffix VV ≤ 36 , The output has been evaluated as Class 2, Clause 7.12.1.

For models with $36 < \text{suffix VV} \leq 56$, the output has been evaluated as Low voltage Limited energy, Section 8.14

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

For models with suffix VV ≤ 36 , the output has been evaluated as Extra-Low-Voltage Class 2 Outputs, Clause 8.12.

For models with $36 < \text{suffix VV} \leq 56$, the output has been evaluated as LED Class 2, Annex A.

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.

These products been evaluated for the following characteristics.

				Additionally evaluated to UL 8750 Supplements noted below:						
Model No.	Input type	Output type	Rated for	[] SA-SREC	[X] SB-Type HL	[x] SC-Type TL	[x] SE-Class P	[X] SF-Wired control Circuits(c)	[x] SG-Temperature value @	[] SH-Phase cut dimming
PSBPPW-XXXX-VV-YYYYY-ZZZZZ (when suffix VV <=36)	Branch Circuit Mains	Isolated, Class 2 (a)	[X] Dry [X] Damp [] Wet	[] - Evaluation per SA 3.2 [] - Evaluation per SA 4	No	No	Yes	NOT Evaluated	Tref max-Tc 90 ° C	[] Dimmable [] Dimmable - dimmer model(s) xxx made by xxx
PSBPPW-XXXX-VV-YYYYY-ZZZZZ (when 36 < suffix VV <=56)		Isolated, LVLE (b1), LED Class 2 (b2)								
PSBPPW-XXXX-VV-YYYYY-ZZZZZ (when 56 < suffix VV <=85)		Isolated								

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

b1- As defined in UL 8750, Section 8.14

b2- As defined in CAN/CSA-C22.2 No. 250.13, Annex A

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

@ - The Tc point is located at Driver Housing, outside, top, above of transformer.

For products with wired control circuits- These products do not have appropriate separation and spacings between the wired control circuits and the other circuits of the LED equipment.

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" indicates the component has been evaluated to Canadian requirements and the component shall have a Canadian UL certification Mark (C-UL) or UL certification Mark and CSA certification Mark when the Applicant's basic product bearing C-UL certification Mark.

Product markings-

	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	For models with suffix VV <=56: See product characteristics table- 'Class 2' marked on the device.
x	Electrical Ratings	See electrical ratings table
x	Output Type	See product characteristics table
x	Environmental considerations	See product characteristics table
x	Polarity of supply connections	Applies to [x]Input, [x] Output
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.
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.
x		Optional- "DOUBLE INSULATION", "DOUBLE INSULATED" or symbol: 
x		"CASE MUST BE GROUNDED"

Model PSBPPW-XXXX-VV-YYYYY-ZZZZZ - FIGS. 1 - 7

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	Housing (Metal part)	N/A	N/A	N/A	Extruded aluminum, 1 mm thick min. Four-part construction, top, bottom and two sides, secured together by screws. Two mounting tabs are on two sides. There is a 5.3 mm diameter opening on top housing. See Ill. 1 (unit: mm) for detail dimensions.	I1
2	Insulation Barrier	QMFZ2, CN	Various	Various	Made by PET, Min 0.18 mm thick, 105 °C. Two- part construction, top and bottom, secured together by Insulation Tape, Outer surface is fully covered with one layer of Insulation Tape. All live parts on PWB except input/output lead/Connector J3 are covered by Insulation barrier and input/output/dimmer bushing. Potting compound provided between PWB sharp solder points and the barrier to prevent the barrier from being punctured. See Ill. 2 (unit: mm) for detail dimensions.	I2
3	Insulation Tape	OANZ2	3M COMPANY ELECTRICAL MARKETS DIV (EMD) (E17385)	1350T-1 (b)	One layer provided. Polyethylene terephthalate film tape, 130 °C min, 0.05 mm thick per layer.	-
4	Input Lead Wire	AVLV2, CN	Various	Various	Type 10552, double insulation type, min. 18 AWG, rated min. 300 V, min. 105 °C, min. 152 mm long. Neural is in white color.	-
5	Output/Dimmer Lead Wire	AVLV2, CN	Various	Various	For models with suffix VV<=56: Min. 24 AWG, rated min. 300 V, min. 105 °C, min. 152 mm long. For models with 56< suffix VV <=85: Type 10552, double insulation type, min. 18 AWG, rated min. 300 V, min. 105 °C, min. 152 mm long.	-
6	Input/Output/Dimmer Bushing	QMFZ2	Various	Various	Silicone Rubber, min. 1.2 mm thick, rated 85°C. See Ill. 3 (unit: mm) for detail dimensions.	I3
7	Rubber Cover	QMFZ2	Various	Various	Rubber, rated 110°C min., measured 1 mm thick min. Mechanically fitted with Connector J3. See Ill. 3A (unit: mm) for detail dimensions.	I3A

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F) IG (I) LL
8	Potting compound	QMFZ2	DONGGUAN ZHAOSHUN SILICONE NEW MATERIAL TECHNOLOGY CO LTD (E329120)	ZS-GF	Silicone (SI). Rated V-0, 150°C, grey color. Fully covered all components except Connector J3 inside enclosure, including the solder side.	-
Main Board						
9	Printed Wiring Board	ZPMV2, CN	Various	Various	Rated min. V-1, 130 °C. Measured 94.36 mm length by 21.54 mm width by 1.6 mm thick. Suitable for support of live parts. See ILL.4 for PWB trace layouts.	I4
10	Fuse (F1)	JDYX2, CN	CONQUER ELECTRONICS CO LTD (E82636)	MST	Rated 300 Vac, 1.6 A, connected in series with ungrounded supply	-
10.1	Alternate	JDYX, CN	Various	Various	Same as above.	-
11	X Capacitor (C1)	FOWX2, CN	Various	Various	Rated 310 Vac min., 0.15 uF max, 110 °C min. Located across the line.	-
12	Surge Protective Devices (MV1)	VZCA2, CN	Various	Various	SPD 5, minimum rated operating voltage 320 Vac, minimum 320 V MCOV, minimum 0.5 KA In, maximum 1090 Vpeak MLV, temperature rating 125 °C.	-
13	Y Capacitor (C18/C104)	FOWX2, CN	Various	Various	Y2 type. Rated 400 V min., 110 °C min, 1 nF max. Bridging Primary to Secondary.	-
14	Optical Isolators (IC6)	FPQU2, CN	Various	Various	Rated 3750 V isolation voltage, min 110 °C. Bridging Primary to Secondary.	-
15	Capacitors (C36)	N/A	Various	Various	Electrolytic type, rated 100 uF, 50 V min., 125°C min. Outer surface is fully covered by Tubing.	-
16	Tubing	YDPU2	Various	Various	Rated 125°C min.	-
17	Thermistor (RT3)	XGPU2, CN	Thinking Electronic Industrial Co., Ltd(E138827)	TPM1S103P120	SMD, 10K ohm, Tmoa: 135°C.	-
Small Board						
18	Printed Wiring Board	ZPMV2, CN	Various	Various	Rated min. V-1, 130 °C. Measured 64.7 mm length by 16.1 mm width by 1 mm thick. Suitable for support of live parts. Soldered on Main Board. See ILL.5 for PWB trace layouts.	I5
19	Optical Isolators (IC12/IC4)	FPQU2, CN	Various	Various	Rated 3750 V isolation voltage, min 110 °C. Bridging Primary to Secondary.	-
20	Capacitors (C9/C14)	N/A	Various	Various	Electrolytic type, rated 15 uF, 350 V min., 130°C min.	-

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F) IG (I) LL
21	Thermistor (RT1)	XGPU2, CN	Thinking Electronic Industrial Co., Ltd(E138827)	SCK-103	Rated 10ohm, 3A, max. surface temperature 170°C	-
22	Connector (J3)	QMF22	Various	Various	Rated 110 °C min, measure 1.1 mm thick min. Located in the circuit without risk of fire or risk of shock. Soldered on Small PWB. See Ill.5A (unit: mm) for detail dimensions.	I5A
23	Other components	N/A	N/A	N/A	See ILL.6 and model difference for details.	I6

Model Different list:

Components	PSB50W-0550-85 56<VV<=85	PSB50W-0850-56 36<VV<=56	PSB50W-1400-36 VV<=36
R14	RES,1206,0.5-OHM,1/4W	RES,1206,0.3-OHM,1/4W	RES,1206,0.15-OHM,1/4W
R28	RES,0402,2.94K,1/16W	RES,0402,2.74K,1/16W	RES,0402,2.21K,1/16W
R144	RES,0603,13.7K,1/10W	RES,0603,11.8K,1/10W	/
R4	RES,0402,25.5K-OHM,1/16W	RES,0402,33.2K,1/16W	/
R211	RES,0402,4.99K,1/16W	RES,0402,10K,1/16W	/
R52	RES,0402,3.32K,1/16W	RES,0402,619-OHM,1/16W	/
R167	RES,0402,3.24K,1/16W	RES,0603,3.24K,1/10W	/
R213	RES,1206,750-OHM,1/4W	RES,1206,2K,1/4W	/
R80	RES,0603,100K,1/10W,	RES,0402,100K,1/16W	/
C109	CAP,X7R,0603,0.47uF,25V,MUL,	CAP,X7R,0402,0.47uF,10V,	/
C96	CAP,NPO,0402,1000pF,50V,	/	/
C10,C101,C105	CAP,NPO,0402,1000pF,50V,	CAP,X7R,0402,1000pF,50V,	/
C5	CAP,NPO,0402,220pF,50V,	CAP,X7R,0402,220pF,50V,	/
D83	DIODE,SOD323,100V,0.15A	DIODE,SOD323,30V,0.2A,BAT54W S,SD	/
D7	DIODE,SOD323,30V,0.2A,BAT54W S,SD	DIODE,SOD323,100V,0.15A	/
D17	DIODE,SOD323,30V,0.2A,BAT54W S,SD	Diode,Schottky,SOD323,100V,1 50mA,SD	/
L2	INDUCTOR, PFC, 1.0mH	INDUCTOR, PFC, 1.0mH	INDUCTOR, PFC, 0.9mH
Q41	MOSFET,N CH,SOT323,60V,115mA,no gate clamp	TRANSISTOR,N CH,SOT23,60V,470mA	/
Z5	DIODE,ZENER,SOD123,7.5V,0.5W ,50uA	DIODE,ZENER,SOD123,7.5V,0.5W ,50uA	/
C13	/	CAP,X7R,0603,0.22uF,25V,MUL, ,	/
R210	/	RES,0603,750-OHM,1/10W	/
R215	/	RES,0402,4.02K,1/16W	/
ACROSS R76	CAP,X7R,0402,1000pF,50V, ' 1/16W	/	/

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F) IG (I) LL
1	Ring Coil (L1)	N/A	N/A	N/A	Rated 38 mH.	-
1.1	Core	N/A	Various	Various	Ferrite. Overall 12 mm OD by 6 mm ID by 6.5 mm thick.	-
1.2	Coil (N1, N2)	OBMW2	Various	Various	Enamel copper wire, 130 °C min. 0.25 mm OD, 65 turns.	-
1.3	Barrier	ZPMV2	Various	Various	Minimum V-2, min. 105°C. Provided with minimum 0.8 mm thick to separate the windings.	-
1.4	Insulation Tape	OANZ2	Various	Various	Polyethylene terephthalate film tape, 130 °C min, 0.05 mm thick per layer. 1 layer provided to cover outer surface of L1.	-
2	Inductor (L3)	N/A	N/A	N/A	Rated 2.2 mH.	-
2.1	Core	-	Various	Various	Ferrite. Overall 11.9 mm OD by 5.89 mm ID by 4.72 mm thick.	-
2.2	Coil	OBMW2	Various	Various	Enamel copper wire, 130 °C min. 0.25mm OD, 180 turns.	-
2.3	Tape	OANZ2	Various	Various	Polyethylene terephthalate film tape, 130 °C min, 0.05 mm thick per layer. One layer provided. Fully covered Core and Coil.	-
3	Ring Coil (L5)	N/A	N/A	N/A	Rated 16.32 uH.	-
3.1	Core	-	Various	Various	Ferrite. Overall 8 mm OD by 4 mm ID by 4 mm thick.	-
3.2	Coil (N1)	OBMW2	Various	Various	Enamel copper wire, 130 °C min. 0.3 mm OD, 8 turns.	-
3.3	Coil (N2)	OBJT2	Various	Various	Triple insulation wire, 130°C min. 0.3 mm OD, 8 turns.	-
4	PFC Inductor (L2) For models with suffix VV <=56	-	-	-	Rated 1 mH. Refer to Ill. 7 for details	I7
4.1	Core	-	Various	Various	Ferrite. 16.4 mm by 11.2 mm by 5.95 mm overall.	-
4.2	Bobbin	QMFZ2	Various	Various	Phenolic, 0.71 mm thick minimum, rated V-0, 150 °C.	-
4.3	Coil	OBMW2	Various	Various	Enamel copper wire, 130 °C min.,	-
4.4	Tape	OANZ2	Various	Various	Polyethylene terephthalate film tape, 130 °C min, 0.05 mm thick per layer. Fully covered with outer surface of Coil and Core.	-

Winding devices (Cont'd):

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F) IG (I) LL
5	PFC Inductor (L2) For models with 56< suffix VV <=85	-	-	-	Rated 0.9 mH. Refer to Ill. 8 for details	I8
5.1	Core	-	Various	Various	Ferrite. 16.4 mm by 11.2 mm by 5.95 mm overall.	-
5.2	Bobbin	QMFZ2	Various	Various	Phenolic, 0.71 mm thick minimum, rated V-0, 150 °C.	-
5.3	Coil	OBMW2	Various	Various	Enamel copper wire, 130 °C min.,	-
5.4	Tape	OANZ2	Various	Various	Polyethylene terephthalate film tape, 130 °C min, 0.05 mm thick per layer. Fully covered with outer surface of Coil and Core.	-
6	Transformer (T1)	-	-	-	Refer to Ill. 9 for details	I9
-	Electrical insulation system	OBJY2	MAO HSIN ELECTRONIC CO LTD (E182305)	GH-130	Rated 130°C (Class B).	-
6.1	Core	-	Various	Various	Ferrite, 16.4 mm by 11.2 mm by 5.95 mm overall. Fully wrapped by 2 layer of Tape (Item 6.4) to maintain spacing between Core and secondary winding.	-
6.2	Bobbin	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	SUMIKON PM- 9820	Phenolic, 0.71 mm thick minimum, rated V-0, 150 C. Three-flange type.	-
6.3	Windings (N1,N2,N3A, N3B, N4, N5, N6)	OBMW2	Various	Various	ANSI type MW28/75/79/80/82/83, 155 °C min. Provided 2 layer of Tape (Item 6.4) with a continuous enough wide bent up edge to maintain spacing between primary and secondary winding.	-
6.4	Tape	OANZ2	3M COMPANY ELECTRICAL MARKETS DIV (EMD) (E17385)	1350T-1 (b)	Polyethylene terephthalate film tape, 130 °C min, 0.05 mm thick per layer.	-
6.5	Varnish	OBOR2	JOHN C DOLPH CO (E317427)	BC-370	Rated minimum 130 °C.	-
7	Ring Coil (L7)	N/A	N/A	N/A	Rated 3.8 uH.	-
7.1	Core	N/A	Various	Various	Ferrite. Overall 8 mm OD by 4 mm ID by 4 mm thick.	-
7.2	Coil (N1,N2)	OBMW2	Various	Various	Enamel copper wire, 130 °C min. 0.5 mm OD, 4 turns.	-