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REPORT

On

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

***SOLUM CO LTD**
***REPUBLIC OF KOREA**

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DESCRIPTION

PRODUCT COVERED:

USR, CNR- Component LED Driver, see electrical ratings table for models.

USR - United States Recognized Component

CNR - Canada Recognized Component

ELECTRICAL RATINGS:

Model No.	Input			Output		
	Voltage (Vac)	Frequency (Hz)	Current (A), Power (W)	Voltage (Vdc)	Frequency (Hz)	Current (A)
PSDV151104B	120-277	50/60	2.0 A, 170 W	50-100	N/A	1.5 A

TECHNICAL CONSIDERATIONS (NOT FOR UL FIELD REPRESENTATIVE USE):

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

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

These products been evaluated for the following characteristics.

Model No. applies to all models	Input type	Output type	Product is rated	Type HL (a)	Type TL (b)
PSDV151104B	Branch Circuit (Mains)	Output type- CC Output is Isolated	Damp	No	No

a- Evaluated per UL 8750 requirements for Type HL LED drivers

b- Evaluated per UL 8750 requirements for Type TL LED drivers

Conditions of Acceptability:

Use - For use only in (or with) complete equipment where the acceptability of the combination is determined by UL LLC.

1. Rated output loading for these products was achieved using LED loads. The need for other consideration should be considered in end-use product.
2. During the normal temperature test of the end product, the temperature at Tc (Case surface above transformer (TM01)) is to be monitored. The absolute value at Tc cannot exceed 85 °C designated by manufacturer. (Calculated value by test: 91.5 °C) This value was calculated based on temperatures observed during testing and temperature ratings of the integral components including the electrical insulation system. This value was designated by manufacturer based on calculated values by test.
3. These products utilize a UL Recognized OBJY2 Class 130 (B) electrical insulation system.
4. These products are intended for building in. The enclosure for these products has no openings. Acceptability of the LED driver with respect to mounting, spacing, casualty, temperature and segregation is to be determined as part of the end device evaluation.
5. These products are provided with 18 AWG, stranded leads, rated 105 °C, 300 V minimum for input connections and 24 AWG, stranded leads, rated 105 °C, 300 V minimum for output connections. Acceptability of the input lead wire being smaller than 18 AWG is to be determined as part of the end product evaluation. Acceptability of the leads relative to strain relief and secureness, is to be determined as part of the end device evaluation.
6. These products are intended to be operated in a maximum 20 A branch circuit.
7. These products are provided with an internal green grounding lead that is between the internal board bonded directly and rear metal case mechanically secured by a screw. The need for bonding the dead metal enclosure shall be considered in the end product.
8. The input and output connections have been invested for factory wiring only, connection to supply mains shall be determined in the end product.
9. These products are dimmable using a low voltage DALI proprietary interface.
10. Outer Case has not been invested for final enclosure, the suitable enclosure shall be provided in the end-use product.

Conditions of Acceptability (CONT'D):

11. These products have been judged on the basis of the required spacings as indicated in the standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products, UL 8750 in addition to the standard for Insulation Coordination Including Clearances and Creepage Distances for Electrical Equipment, UL 840, and Light Emitting Diode (LED) Equipment for Lighting Applications, CSA C22.2 No. 250.13.
12. The units employ input surge suppression protection suitable for use in Type 3 application. The suitability of the use shall be determined in the end-product application.
13. These products marked suitable for dry and damp locations. Additional considerations will be necessary as these LED drivers are integrated into wet rated end devices (i.e. input and output supply connection means, accessibility of the output based on maximum voltage restrictions for wet rated Class 2 circuits, acceptability of markings, etc.).
14. Output wires shall be completely enclosed in the end product. It shall be considered in the end product.
15. A potting compound inside the enclosure was used to embed all internal parts and input/output leads fully. The Strain Relief test was not considered necessary in the evaluation.

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-

1. Recognized company name, File number or trademark (If authorized).
2. Model designation.
3. Factory ID or code, when more than one factory.
4. Date Code: see below table,

Mean Digit	Plant	Year	Month	Date	Model Code	Serial No
Example	C1 or C2	00~99	1..9, A, B, C	01,02,..31	1~9,A~Z:	0001~9999

5. Optional - Electrical Ratings- see electrical ratings table.
6. Optional - Output Type- see product characteristics table.
7. Optional - Environmental considerations- see product characteristics table.
8. Optional - Polarity of the Input and Output Connections.
9. Optional - Temperature Measurement Point (Tc).

Model PSDV151104B - FIGS. 1 THRU 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)I G (I)L L
1	Case body	-	Various	Various	Aluminum alloy sheet metal, min. 1.5 mm thick, overall measured 207.0 mm by 60.0 mm by 32.0 mm (L x W x H).	F1, I1
2	Side Cover (Input)	-	Various	Various	Aluminum alloy sheet metal, min. 1.5 mm thick, overall measured 60.0 mm by 32.0 mm by 16.0 mm (L x W x H), mechanically secured to Case Body by screws.	F2, I2
3	Side Cover (Output)	-	Various	Various	Same as above.	I3
4	Input Lead Wire	AVLV2, CN	Various	Various	Min. 18 AWG, stranded leads, rated min. 300 V, min. 105 °C, min. 152 mm long.	
5	Output Lead Wire (LED)	AVLV2, CN	Various	Various	Min. 20 AWG, rated min. 300 V, min. 105 °C.	
6	Output Lead Wire (Dimming)	AVLV2, CN	Various	Various	Min. 24 AWG, rated min. 300 V, min. 105 °C.	
7	Grounding Lead Wire	AVLV2, CN	Various	Various	Min. 18 AWG, rated min. 300 V, min. 105 °C. Green or with yellow strip, between the internal board bonded directly and rear metal case mechanically secured by a screw.	

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
8	Insulation sheet	QMFZ2	TORAY INDUSTRIES INC (E86511)	Lumirror (#)	Polyethylene Terephthalate (PET), Rated 105 °C, VTM-2, double layers, minimum 0.18 mm total thickness, fully wrap internal LED Driver against Case, see ILL. 4 for detailed dimension and shape.	I4
	Alternate	QMFZ2	SKC CO LTD (E74359)	SH71S, SG00L, SR50, SR53	Same as above.	
9	Printed Wiring Board (For Main Circuit)	ZPMV2, CN	Various	Various	Rated min. 130 °C, V-0. Overall approx. 200.0 mm by 53.0 mm (L x W), 1.6 mm thick. Suitable for support of live parts.	I5
9A	Printed Wiring Board (For Sub Circuit)	ZPMV2, CN	Various	Various	Rated min. 130 °C, V-0. Overall approx. 40.0 mm by 20.0 mm (L x W), 1.0 mm thick. Suitable for support of live parts.	I6
10	Potting compound	QMFZ2	DOW CORNING CO RP (E40195)	170#	Silicone (RTV), 105 °C, furnished as two liquid components. Completely surrounds circuit board in case.	
11	Input/Output/Dimming Grommet	QMFZ2	Various	Various	Rated min. 130 °C, min. 1.2 mm thickness.	

Model PSDV151104B - FIGS. 1 THRU 5 (CONT'D)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F) I G (I) L L
12	Fuse (FS01)	JDYX2 , CN	LITTELFUSE WICKMANN WERKE (E67006)	369 +	Rated 5.0 A, 300 V, connected in series with ungrounded supply.	
13	Thermistor (NT01)	XGPU2 , CN	Various	Various	Rated 2.5 ohm at 25 °C.	
14	Varistor (VX01)	VZCA2 , CN	SHANDONG AMOTECH ELECTRONIC CO LTD (E365478)	INR 14D751	SPD Type 4 for use in Type 3 applications, voltage rating min. 460 Vac.	
15	Capacitor (CX01)	FOKY2 or FOWX2 , CN	Various	Various	Located across the line, rated min. 305 Vac, min. 105 °C, max. 330 nF.	
16	Capacitor (CX02)	FOKY2 or FOWX2 , CN	Various	Various	Located across the line, rated min. 305 Vac, min. 105 °C, max. 220 nF.	
17	Bridge Diode (BD01)	-	Various	Various	Rated min. 600 V, max. 25 A.	
18	Film Capacitor (CP01)	-	Various	Various	Rated min. 500 V, min. 105 °C, max. 1000 nF.	
19	Film Capacitor (CM22)	-	Various	Various	Rated min. 1600 V, min. 105 °C, max. 3.3 nF.	
20	Electrolyti c Capacitor (CP10)	-	Various	Various	Rated min. 500 V, min. 105 °C, max. 100 uF.	
21	Resistors (RX01, RX02, RX03)	-	Various	Various	Rated 330 kohm, 0.25 Watt.	
22	FET (QP01)	-	Various	Various	Rated min. 600 V, max. 15 A.	

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F) I G (I) L L
23	FETs (QM03, QM04)	-	Various	Various	Rated min. 600 V, max. 7.5 A.	
24	IC (UP01)	-	Various	Various	Type SEM3040.	
25	IC (UM01)	-	Various	Various	Type FA6A20N.	
26	IC (US03) - Secondary	-	Various	Various	Type TSM103WAIDT	
27	Rectifier Diode (DP01)	-	Various	Various	Rated min. 600 V, max. 10 A.	
28	Rectifier Diode (DP03)	-	Various	Various	Rated min. 1000 V, max. 3 A.	
29	Capacitor (CY01)	FOWX2, CN	Various	Various	Rated 3.3 nF, min. 400 V, min. 125 °C. Class Y1. Bridging Primary to Secondary.	
30	Capacitor (CY02)	FOWX2, CN	Various	Various	Rated 3.3 nF, min. 400 V, min. 125 °C. Class Y1. Located Secondary to F.G.	

Model PSDV151104B - FIGS. 1 THRU 5 (CONT'D)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F) I G (I) L L
31	Optical Isolators (PC01, PC02) - For Main Circuit	FPQU2, CN	Various	Various	Rated min. 3000 Vac isolation, 110 °C max. operating temperature.	
32	Optical Isolators (PCD01, PCD02) - For Sub Circuit	FPQU2, CN	Various	Various	Rated min. 3000 Vac isolation, 110 °C max. operating temperature.	
33	Rectifier Diodes (DS01, DS02) - Secondary	-	Various	Various	Rated min. 300 V, max. 20 A.	
34	FET (QS01) - Secondary	-	Various	Various	Rated min. 500 V, max. 18 A.	
35	Electrolytic Capacitors (CS01, CS02) - Secondary	-	Various	Various	Rated min. 160 V, min. 105 °C, max. 68 uF.	
36	Heat sink (HS1) - Primary	-	Various	Various	Aluminum alloy, measured overall size 49.0 mm by 42.5 mm by 20.0 mm (L x W x H). Secured to PWB by soldering.	
37	Heat sink (HS2) - Secondary	-	Various	Various	Aluminum alloy, measured overall size 37.6 mm by 11.5 mm by 21.0 mm (L x W x H). Secured to PWB by soldering.	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)IG (I)LL
1	Line Filters (LX01)- Primary, (LS01)- Secondary				Refer to Ill. I7 for details.	I7
1.1	Core	-	N/A	N/A	Ferrite, toroidal type, overall approx. 8.1 mm by 4.1 mm by 3.1 mm (OD x ID x H).	
1.2	Coil (1-3)	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C.	
1.3	Coil (2-4)	OBJY2 or AVLV2	Various	Various	Triple insulated wire or Teflon wire, each rated min. 130 °C.	
1.4	Base	QMFZ2	CHANG CHUN PLASTICS CO LTD (E59481)	T375HF	Phenolic Molding Compound (PMC), min. 0.43 mm thick, rated V-0, 150 °C.	
	Alternate	QMFZ2	HEXION GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), min. 0.81 mm thick, rated V-0, 150 °C.	
1.5	Tube	YDPU2	Various	Various	Rated min. 200 °C, 300 V, VW-1, located at pins #2 and #4.	
2	Line Filters (LX02, LX03)- Primary				Refer to Ill. I8 for details.	I8
2.1	Core	-	N/A	N/A	Ferrite, toroidal type, overall approx. 16.0 mm by 10.0 mm by 7.0 mm (OD x ID x H).	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)I G (I)L L
2.2	Coil	OBMW2	Various	Various	Two provided, Enameled copper wire, each rated min. 130 °C.	
2.3	Core Cover / Coil Separator	QMFZ2	Various	Various	Rated min. 105 °C, min. 0.75 mm thick.	
2.4	Base	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	PM-9630	Phenolic (PF), rated min. 150 °C, min. 0.51 mm thick.	
	Alternate	QMFZ2	CHANG CHUN PLASTICS CO LTD (E59481)	T375HF	Phenolic Molding Compound (PMC), min. 0.43 mm thick, rated V-0, 150 °C.	
	Alternate	QMFZ2	HEXION GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), min. 0.46 mm thick, rated V-0, 150 °C.	
2.5	Tube	YDPU2	Various	Various	Rated min. 200 °C, 300 V, VW-1, located at pins #3 and #4.	
3	PFC (LP01)-Primary				Refer to Ill. I9 for details.	I9
3.1	Core	N/A	N/A	N/A	Ferrite, PQ type, overall approx. 26.5 mm by 9.75 mm by 19.0 mm (L x W x H).	
3.2	Coil (12-1)	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C.	
3.3	Coil (9-7)	OBJT2	Various	Various	Triple insulated wire, rated min. 130 °C.	
3.4	Bobbin	QMFZ2	HEXION GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), 0.46 mm thick min., rated V-0, 150 °C.	
	Alternate	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	PM-9820	Phenolic (PF), rated min. 150 °C, min. 0.51 mm thick.	

Winding devices - See below for details. (CON'T)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)I G (I)L L
3.5	Insulation Tape / Core Fixing Tape	OANZ2	Various	Various	Rated min. 130 °C.	
3.6	Barrier Tape	OANZ2	Various	Various	Rated min. 130 °C.	
3.7	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	
4	Transformer (TM01)-isolated primary to secondary		-	-	Refer to Ills. 10 and 11 detailed construction and insulation system (Class 130 (B) information).	
4.1	Electrical insulation system	OBJY2	LITE-ON TECHNOLOGY CORP (E140167)	LSE-B11	Rated Class 130 (Class B).	I10
	Alternate	OBJY2	CLOVER HI-TECH CO LTD (E167514)	SC-04B	Same as above.	I11
4.2	Core	-	-	-	Ferrite, EFD type, measured overall approx. 38.2 mm by 21.0 mm by 11.8 mm (L x W x H).	
4.3	Bobbin	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	PM-9820	Phenolic (PF), rated min. 150 °C, min. 0.65 mm thick.	
4.4	Cap	QMFZ2	Belong to electrical insulation system	Belong to electrical insulation system	Rated min. 130 °C, min. 0.75 mm thick.	
4.5	Coil	OBMW2 and OBJT2	Belong to electrical insulation system	Belong to electrical insulation system	Enameled copper wire and Triple Insulated Winding Wire, each rated min. 130 °C.	
4.6	Core fixing tape	OANZ2	Belong to electrical insulation system	Belong to electrical insulation system	Polyethylene terephthalate film tape, rated 130 °C, min. 0.025 mm thick per layer.	

Winding devices - See below for details. (CON'T)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)I G (I)L L
4.7	Barrier tape	OANZ2	Belong to electrical insulation system	Belong to electrical insulation system	Rated min. 130 °C.	
4.8	Tube - Secondary Pin #11 only	YDPU2	Belong to electrical insulation system	Belong to electrical insulation system	Rated min. 150 V, min. 200 °C.	
4.9	Varnish	OBOR2	Belong to electrical insulation system	Belong to electrical insulation system	Rated min. 130 °C.	