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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)
PSDV180101U, PSDV180101A	120-277	50/60	0.5 A, 30 W	20-55	N/A	0.35

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. The output has been evaluated as Class 2, Clause 7.12.1.

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. The output has been evaluated as LED Class 2, Annex A.

DIFFERENCES BETWEEN MODELS:

Model PSDV180101U is identical to Model PSDV180101A except model designation.

These products been evaluated for the following characteristics.

Model No.	Input type	Output type	Product is rated	Type HL (c)	Type TL (d)
PSDV180101U, PSDV180101A	Branch Circuit (Mains)	Output type- CC Output is Class 2 (a), LED Class 2 (b)	Damp	No	No

a- As defined in UL 8750, Clause 7.12.1

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

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

d- 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 this product 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 (Above the heat sink for FET (Q101)) is to be monitored. The absolute value at Tc cannot exceed 85 °C designated by manufacturer. (Calculated value by test: **92.4** °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. This product utilizes a UL Recognized OBJY2 Class 130 (B) electrical insulation system.
4. This product is intended for building in. 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. The product is provided with minimum 18 AWG, stranded leads, rated 105 °C, 300 V minimum for input connections, minimum 20 AWG, stranded leads, rated 105 °C, 300 V minimum for output connections and minimum 24 AWG, stranded leads, rated 105 °C, 300 V minimum for dimming connections. The suitability of the use shall be determined in the end-product application.
6. The grounding means shall be considered in each end use application.
7. This product is dimmable using a low voltage 0-10 V interface.
8. The product has 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.
9. The unit employs input surge suppression protection suitable for use in Type 3 application. The suitability of the use shall be determined in the end-product application.
10. The product is intended to be operated in a maximum 20 A branch circuit. If used on a branch circuit greater than 20 A, additional testing may be necessary and shall be considered in the end product.

Conditions of Acceptability (CONT'D):

11. The input and output connections have been invested for factory wiring only, connection to supply mains shall be determined in the end product. If the product shall be intended to use in field wiring, the suitability shall be determined in each end-use application.
12. Outer Case has not been invested for final enclosure, the suitable enclosure shall be provided in the end-use product.
13. This product 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. Based on maximum voltage restrictions for Class 2 circuits in the Canadian Electrical Code, the output cannot be accessible. The output terminals of the end product should be evaluated to confirm compliance with this accessibility requirement, either based on output terminal design or based on manufacturer specifications for its use in restricted access areas only. The latter option will require markings on the end product as well as the installation manual.

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.
Product is marked Class 2 based on compliance with UL 8750, Clause 7.12.1 and CAN/CSA-C22.2 No. 250.13, Annex A.
7. Optional - Environmental considerations: see product characteristics table.
8. Optional - Polarity of the Input and Output Connections.
9. Optional - Temperature Measurement Point (Tc).
10. Optional - Maximum ambient temperature (Tma): 60 °C. (Designated by manufacturer)

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Model PSDV180101U - FIGS. 1 THRU 5

(Model PSDV180101U represents model PSDV180101A.)

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	Body Case	-	Various	Various	Aluminum alloy sheet metal, min. 1.5 mm thick, overall measured 93.0 mm by 60.0 mm by 32.0 mm (L x W x H).	F1, I1
2	Side Case(Input)	-	Various	Various	Aluminum alloy sheet metal, min. 1.5 mm thick, overall measured 207.0 mm by 60.0 mm by 16.0 mm (L x W), mechanically secured to Case Body by screws.	F2, I2
3	Side Case(Output)	-	Various	Various	Same as above.	F2, I3
4	Input Lead Wire	AVLV2, CN	Various	Various	Min. 18 AWG, rated min. 300 V, 105 °C, min. 152 mm long.	
5	Output Lead Wire (LED)	AVLV2, CN	Various	Various	Min. 20 AWG, rated min. 300 V, 105 °C, min. 152 mm long	
6	Output Lead Wire (Dimming)	AVLV2, CN	Various	Various	Min. 24 AWG, rated min. 300 V, 105 °C, min. 152 mm long.	
7	Input/Output/Dimming Grommet	QMFZ2, CN	Various	Various	Rated min. 150 °C, min. 2.0 mm thickness.	
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.	F3, I4
	Alternate	QMFZ2	SKC CO LTD (E74359)	SH71S, SG00L, SR50, SR53	Same as above.	
9	Potting Compound	QMFZ2	DOW CORNING CORP (E40195)	170#	Silicone (RTV), RTI 105 °C, furnished as two liquid components. Completely surrounds circuit board in Case.	
10	Printed Wiring Board (For LED Circuit)	ZPMV2, CN	Various	Various	Rated min. 130 °C, V-0. Overall approx. 90.5 mm by 53.0 mm (L x W), 1.5 mm thick. Suitable for support of live parts.	F4, F5, I5
11	Printed Wiring Board (For Dimming Circuit)	ZPMV2, CN	Various	Various	Rated min. 130 °C, V-0. Overall approx. 44.0 mm by 24.0 mm (L x W), 1.1 mm thick. Suitable for support of live parts.	F4, F5, I6
12	Fuse (FS101)	JDYX2, CN	LITTELFUSE WICKMANN WERKE (E67006)	369 +	Rated 5.0 A, 300 V, connected in series with ungrounded supply.	
13	Fuse (FS102)	JDYX2, CN	LITTELFUSE WICKMANN WERKE (E67006)	369 +	Rated 2.0 A, 300 V, connected in series with LX102.	

Model PSDV180101U - FIGS. 1 THRU 5 (CONT'D)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
*14	Varistor (VX101S)	VZCA2, CN	THINKING ELECTRONIC INDUSTRIAL CO LTD (E314979)	TVR10561-V	SPD Type 5, rated operating voltage 350 Vac, 350 V MCOV, 1.5 kA In, 1390 Vpk MLV.	
15	Thermistor (NT101)	XGPU2, CN	Various	Various	Rated 5 ohm at 25 °C.	
16	Capacitor (CX101)	FOKY2 or FOWX2, CN	Various	Various	Located across the line, rated min. 305 Vac, min. 105 °C, max. 47 nF.	
17	Bridge Diode (BD101)	-	Various	Various	Rated min. 600 V, max. 3.0 A.	
18	Film Capacitor (C100)	-	Various	Various	Rated min. 630 Vdc, max. 47 nF.	
19	Film Capacitor (C101)	-	Various	Various	Rated min. 630 V, max. 100 nF.	
20	FET (Q101)	-	Various	Various	Rated min. 600 V, max. 6.5 A.	
21	FET (Q102)	-	Various	Various	Rated min. 800 V, max. 5.5 A.	
22	Heat sink for FET (Q101)	-	Various	Various	Overall approx. 12.2 mm by 12.6 mm by 18.5 mm, refer to Ill. 7 for detailed dimensions.	I7
23	Electrolytic Capacitor (C102)	-	Various	Various	Rated min. 500 V, min. 105 °C, max. 22 uF.	
24	Electrolytic Capacitor (C108)	-	Various	Various	Rated min. 50 V, min. 105 °C, max. 47 uF.	
25	Capacitor (CY101)	FOWX2, CN	Various	Various	Rated 3.3 nF, min. 400 V, min. 125 °C. Class Y1. Bridging Primary to secondary.	
25A	Capacitor (CY102)	FOWX2, CN	Various	Various	Rated 3.3 nF, min. 400 V, min. 125 °C. Class Y1. Located Secondary to Ground Reference Point.	
26	Optical Isolator (PC101)	FPQU2, CN	Various	Various	Rated min. 3000 Vac isolation, 110 °C max. operating temperature.	
27	Electrolytic Capacitors (C203, C204)	-	Various	Various	Rated min. 80 V, min. 105 °C, max. 82 uF.	
28	Electrolytic Capacitor (C206)	-	Various	Various	Rated min. 50 V, min. 105 °C, max. 22 uF.	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)IG (I)LL
1	Line Filter (LX101)- Primary				Refer to Ill. 8 for details.	I8
1.1	Core	N/A	N/A	N/A	Ferrite, toroidal type, overall approx. 10.0 mm by 6.0 mm by 4.0 mm (OD x ID x H).	
1.2	Coil	OBMW2	Various	Various	Two provided, enameled copper wire each rated min. 130 °C.	
*1. 3	Coil Separator	QMFZ2	TORAY INDUSTRIES INC (E41797)	L304T40	Liquid Crystal Polymer (LCP), min. 0.38 mm thick, rated V-0, 130 °C.	
	Alternate	QMFZ2	SOLVAY ENGINEERING PLASTICS GBU (E44716)	A 50H1 (r3)(f2)	Polyamide 66 (PA66), min. 0.4 mm thick, rated V-0, 105 °C.	
*1. 4	Base	QMFZ2	HEXION GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), min. 0.81 mm thick, rated V-0, 150 °C. NC, GN, BK Color only.	
	Alternate	QMFZ2	CHANG CHUN PLASTICS CO LTD (E59481)	T375HF	Phenolic Molding Compound (PMC), min. 0.43 mm thick, rated V-0, 150 °C.	
1.5	Tube	YDFU2	Various	Various	Rated min. 125 °C, intended to wrap around a body.	
2	Line Filter (LX102)- Primary				Refer to Ill. 9 for details.	I9
2.1	Core	N/A	N/A	N/A	Ferrite, UU type, overall approx. 10.5 mm by 15.8 mm by 5.0 mm ((L x W x H).	
2.2	Coil	OBMW2	Various	Various	Two provided, enameled copper wire, each rated min. 130 °C.	
2.3	Bobbin	QMFZ2	HEXION GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), min. 0.46 mm thick, 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.	
2.4	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	

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

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
3	Inductor (L100)- Primary				Refer to Ill. 10 for details.	I10
3.1	Core	N/A	N/A	N/A	Ferrite, drum type, overall approx. 8.0 mm by 3.6 mm by 13.2 mm (OD x ID x H).	
3.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C.	
3.3	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	
3.4	Tube	YDPU2	Various	Various	Rated min. 125 °C, intended to wrap around a body.	
4	PFC (L101)- Primary				Refer to Ill. 11 for details.	I11
4.1	Core	N/A	N/A	N/A	Ferrite, EE type, overall approx. 14.8 mm by 14.0 mm by 7.0 mm (L x W x H).	
4.2	Coil	OBMW2 and OBJT2	Various	Various	Two provided, one is enameled copper wire and another is triple insulated wire, each rated min. 130 °C.	
4.3	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.	
4.4	Insulation Tape / Core Fixing Tape	OANZ2	Various	Various	Rated min. 130 °C.	
4.5	Barrier Tape	OANZ2	Various	Various	Rated min. 130 °C.	
4.6	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	
5	Line Filter (L201)- Secondary				Refer to Ill. 12 for details.	I12
5.1	Core	N/A	N/A	N/A	Ferrite, toroidal type, overall approx. 8.0 mm by 4.0 mm by 3.0 mm (OD x ID x H).	
5.2	Coil	OBMW2 and, OBJT2 or AVLV2	Various	Various	Two provided, Enameled copper wire and, Triple insulated wire or Teflon wire, each rated min. 130 °C.	
5.3	Tube	YDPU2	Various	Various	Rated min. 200 °C, located at pins #2 and #4.	
5.4	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. 0.46 mm thick, rated V-0, 150 °C.	

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

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
6	Transformer (T101)- isolated primary to secondary	-	-	-	Refer to Ills. 13 and 14 detailed construction and insulation system (Class 130 (B) information).	
6.1	Electrical insulation system	OBJY2	YAO SHENG ELECTRONIC CO LTD (E173643)	YCI-130	Rated Class 130 (Class B).	I13
	Alternate	OBJY2	NAM YANG ELECTRONICS CO LTD (E140149)	NYB-003	Same as above.	I14
6.2	Core	-	-	-	Ferrite, EE type, measured overall approx. 23.6 mm by 17.9 mm by 10.8 mm (L x W x H).	
6.3	Bobbin	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	PM-9820	Phenolic (PF), rated min. 150 °C, min. 0.65 mm thick.	
6.4	Coil	OBMW2 and OBJT2	Belong to electrical insulation system	Belong to electrical insulation system	Five provided, Enameled copper wire and Triple Insulated Winding Wire, each rated min. 130 °C. See detailed information as below a table.	
6.5	Insulation Tape / Core fixing tape	OANZ2	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD (E165111)	CT	Polyethylene terephthalate film tape, rated 130 °C, min. 0.025 mm thick per layer. See detailed information as below a table.	
	Alternate	OANZ2	SYMBIO INC (E50292)	35660	Same as above.	
6.6	Varnish	OBOR2	Belong to electrical insulation system	Belong to electrical insulation system	Rated min. 130 °C.	

Location	Wire Type	Wire Size (Diameter, mm)	No. of Turns	Detailed Windings Information (Note)
W1 (Pri. 1-3)	UEW	0.23	45	A12 + B23 + A10
W3 (Sec. 8-7)	STW-B	0.25	30	A8 + B15 + A7
W5 (Pri. 3-2)	UEW	0.23	45	A12 + B23 + A10
W6 (Pri. 4-5)	STW-B	0.20	5	A1.5 + B2.0 + A1.5
W7 (Pri. 5-6)	STW-B	0.20	10	A2.5 + B5.0 + A2.5

(Note) - A: A section (Bottom Side), B: B section (Top Side);

Location	Insulation tape (Thickness, mm)	No. of Turns
W2 (PRI-SEC INSULATION)	0.025 x 4.0	1.5
W4 (PRI-SEC INSULATION)	0.025 x 4.0	1.5
W8 (PRI-SEC INSULATION)	0.025 x 4.0	1.5