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REPORT

On

COMPONENT - 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)
PSDV390101U	120-277	50/60	0.5 A, 60 W	CH1(Main): 20-56	N/A	0.2-0.7
				CH2(Fan): 13.2		0.2

## TECHNICAL CONSIDERATIONS (NOT FOR UL FIELD REPRESENTATIVE USE):

\*USR - Indicates investigation to the U.S. Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products, UL 8750, First Edition. The outputs have 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, CSA C22.2 No. 250.13-12, **Second** Edition.

The **outputs have** been evaluated as **LED Class 2**, Annex A.

\*

## Conditions of Acceptability:

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

1. This product been evaluated for the following characteristics.

Model No.			Product is rated	Type HL (c)	Type TL (d)
*PSDV390101U	Input type- [x] Branch Circuit (Mains)	Output type- [x] CC  Output is [x] Class 2 (a) [x] <b>LED Class 2</b> (b)	[x] Damp	[x] No	[x] 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

2. Rated output loading for these products was achieved using resistive loads, electronic loads and LED loads. The need for other consideration should be considered in end-use product.
- \*3. **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.**
- \*4. **The grounding means shall be considered in each end use application.**
5. The temperature tests were performed at nominal 50 °C ambient. During the normal temperature test of the end product, the temperature at the temperature reference point (Tc) is to be monitored. The absolute value at the temperature reference point (Tc, Case surface below TM101) cannot exceed 85 °C (designated by manufacturer, calculated value by test is **85.4** °C, this value was calculated based on temperatures observed during testing and temperature ratings of the integral components including the electrical insulation system).
6. The product utilizes a UL Recognized OBJY2 Class 130 (B) electrical insulation system.

## Conditions of Acceptability (CONT'D):

7. The 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.
- \*8. This product is dimmable using a low voltage 0-10 V interface.
- \*9. **This product is** provided with push-in terminals for supply connection. These terminals are intended for use with 18 AWG stranded copper conductors with 8.5 mm ~ 9.5 mm strip length, **suitable for factory and/or field wiring and type of Use Group (UG) is B and/or D; the type of end-use application for which the specified voltage and spacing level applies. The suitability of the use shall be determined in the end-product application.**
10. 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. 250.13-12.
11. The unit employs input surge suppression protection suitable for use in Type 3 SPD application. The suitability of the use shall be determined in the end-product application.
12. 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.**
- \*
13. The product is intended to be operated in a maximum 10 A branch circuit. **If used on a branch circuit greater than 10 A, additional testing may be necessary and shall be considered in the end product.**
14. Outer Case have not been invested for final enclosure, the suitable enclosure shall be provided in the end-use product.
15. The input and output terminals are Use Group D type, its spacing is 1/16 inch through air, and 1/8 inch over surface at 51 - 300 V rating. The suitability of the use shall be determined in the end-product application.
16. These products are 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.).

## 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. **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).

Model PSDV390101U - FIGS. 1 THRU 6

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	Case Body	-	-	-	Aluminum alloy, min. 1.2 mm thick, overall measured 127.6 mm by 78.8 mm by 18.6 mm (L x W x H) secured together by physical fit.	F1, I1
2	Case Cover	-	-	-	Aluminum alloy, min. 1.1 mm thick, overall measured 127.6 mm by 78.8 mm by 29.8 mm (L x W x H) secured together by physical fit.	F2, I2
3	Plastic cover for Input Push-In Terminal block (CON1)	QMFZ2	SOLVAY ENGINEERING PLASTICS GBU (E44716)	B 50H1(r1)(f2)	Polyamide Type 66/6 nylon (PA66/6). Rated 90 °C, V-0, min. 0.75 mm thickness, ILL. 3 for detailed dimension and shape.	I3
4	Plastic cover for Output Push-In Terminal block (CON2)	QMFZ2	SOLVAY ENGINEERING PLASTICS GBU (E44716)	B 50H1(r1)(f2)	Polyamide Type 66/6 nylon (PA66/6). Rated 90 °, V-0, min. 0.75 mm thickness, ILL. 4 for detailed dimension and shape.	I4
5	Potting Compound	QMFZ2	DOW CORNING CORP (E40195)	170#	Silicone (RTV), RTI 105 °C, furnished as two liquid components. Partially potted.	F3
6	Input Push-In Terminal Block (CON1)	XCFR2, CN	DEGSON ELECTRONICS CO LTD (E228872)	DG208*x	Rated min. 300 V, 7 A, 105 °C, acceptable for field wiring 18 AWG, copper conductor.	
7	Output Push-In Terminal Block (CON2)	XCFR2, CN	DEGSON ELECTRONICS CO LTD (E228872)	DG208*x	Rated min. 300 V, 7 A, 105 °C, acceptable for field wiring 16-20 AWG, copper conductor.	
8	Grounding wire	AVLV2, CN	Various	Various	Min. 18 AWG, rated min. 300 V, 105 °C. Green or with yellow strip, bonded directly to the internal board via metal case.	
9	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 except for plastic covers for input and output push-in terminal blocks, see ILLs. 5 (for bottom) and 6 (for top) for detailed dimension and shape.	F4, I5, I6
	Alternate	QMFZ2	SKC CO LTD (E74359)	SH71S, SG00L, SR50, SR53	Same as above.	
10	Printed Wiring Board	ZPMV2, CN	Various	Various	Rated minimum 105 °C, V-1. Measured approx. 104.0 mm by 73.0 mm (L x W), 1.2 mm thick. Suitable for direct support of live parts.	F5, F6, I7

## Model PSDV390101U - FIGS. 1 THRU 5 (CONT'D)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
*11	Thermal PAD	QMFZ2 or QMTR2	Various	Various	Silicone or Silicone rubber (SIR), rated minimum 150 °C, V-0. Measured approx. 1. 40.0 mm by 30.0 mm (L x W), min. 4.0 mm thick above Main Transformer (TM101). 2. 40.0 mm by 30.0 mm (L x W), min. 2.0 mm thick above Main Transformer (TM101).	
12	Fuse (FS101)	JDYX2, CN	LITTELFUSE WICKMANN WERKE (E67006)	369 +	Rated 2 A, 300 Vac, connected in series with ungrounded supply.	
13	Varistor (VX101S)	VZCA2, CN	AMOTECH CO LTD (E332687)	INR14D751	SPD Type 4 for use in Type 3 applications, minimum voltage rating 460 Vac.	
14	X Capacitor (CX101S)	FOWX2 or FOKY2, CN	Various	Various	Line-to-Neutral, rated min. 305 Vac, max. 150 nF, min. 110 °C.	
15	X Capacitor (CX102S)	FOWX2 or FOKY2, CN	Various	Various	Line-to-Neutral, rated min. 305 Vac, max. 220 nF, min. 110 °C.	
16	Y Capacitor (CY106S)	FOWX2, CN	Various	Various	Rated max. 1.5 nF, min. 400 Vac, min. 125 °C, Located Primary to Secondary.	
17	Optical Isolator (PC101S)	FPQU2, CN	Various	Various	Rated min. 3000 Vac isolation, min. 110 °C operating temperature.	
18	Bridge Diode (BD101)	-	Various	Various	Rated min. 600 V, max. 4.0 A.	
19	Film Capacitor (CP171)	-	Various	Various	Rated min. 630 V, 100 nF max.	
20	Electrolytic Capacitor (CP151)	-	Various	Various	Rated min. 500 V, 22 uF, 105 °C.	
21	FETs (QP101, QM111, QM112)	-	Various	Various	Rated min. 600 V, max. 7.5 A, located on primary circuit.	
22	Rectifier Diode (DP172)	-	Various	Various	Rated min. 600 V, max. 3 A, located on primary circuit.	
23	Rectifier Diodes (DP171, DP173)	-	Various	Various	Rated min. 1000 V, max. 1 A, located on primary circuit.	

Model PSDV390101U - FIGS. 1 THRU 6 (CONT'D)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
24	CY101S	FOWX2, CN	Various	Various	Rated max. 1.0 nF, min. 400 Vac, min. 125 °C.	



Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)I G (I)L L
1	Line Filter (LX101S) - primary circuit	-	-	-	Refer to Ill. 8 for details.	I8
1.1	Core	-	-	-	Ferrite, toroidal type, overall approx. 8.1 mm (OD) by 4.1 mm (ID) by 3.1 mm thick.	
1.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C. Overall 0.3 mm diameter, 10 ± 1 turns, wound pins #1 and #3.	
1.3	Coil	OBJT2 or AVLV2	Various	Various	Triple insulated wire or Teflon wire, rated min. 130 °C. Overall 0.3 mm diameter, 10 ± 1 turns, wound pins #2 and #4.	
1.4	Insulation Tube	QMFZ2	Various	Various	Polytetrafluoroethylene (PTFE), rated min. V-0, 1.5 mm thick, 180 °C.	
1.5	Base	QMFZ2	MOMENTIVE SPECIALTY CHEMICALS GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), 0.46 mm thick min., rated V-0, 150 °C.	
	Alternate	QMFZ2	CHANG CHUN PLASTICS CO LTD (E59481)	T375HF	Phenolic Molding Compound (PMC), 0.43 mm thick min., rated V-0, 150 °C.	

## and Report

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)IG (I)LL
2	Line Filter (LX102S) - primary circuit	-	-	-	Refer to Ill. 9 for details.	I9
2.1	Core	-	-	-	Ferrite, toroidal type, overall approx. 14.0 mm (OD) by 8.0 mm (ID) by 7.0 mm thick.	
2.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C. Overall 0.3 mm diameter, 70 ± 3 turns, wound pins #1-#3 and pins #2-#4 on core.	
2.3	Core Cover / Coil Separator	QMFZ2	SOLVAY ENGINEERING PLASTICS GBU (E44716)	A 50H1 (r3)(f2)	0.4 mm thick min., rated V-0, 105 °C.	
	Alternate	QMFZ2	LG CHEMICAL LTD (E67171)	LUPOX GP- 2156F(#)	0.71 mm thick min., rated V-0, 130 °C.	
	Alternate	QMFZ2	SAMYANG CORPORATION (E121254)	1500GN-(k)	0.75 mm thick min., rated V-0, 130 °C.	
2.4	Insulation Tube	YDPU2	Various	Various	Not Heat-Shrinkable PTFE Tubing, rated min. 300 V, 200 °C for pins #3 and #4.	
2.5	Base	QMFZ2	MOMENTIVE SPECIALTY CHEMICALS GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), 0.46 mm thick min., rated V-0, 150 °C.	
	Alternate	QMFZ2	CHANG CHUN PLASTICS CO LTD (E59481)	T375HF	Phenolic Molding Compound (PMC), 0.43 mm thick min., rated V-0, 150 °C.	
3	Choke coil (LP181) - Primary circuit	-	-	-	Refer to Ill. 10 for details	I10
3.1	Core	-	-	-	Ferrite, drum type, overall approx. 8.0 mm by 13.2 mm (diameter x height).	
3.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C. Overall 0.25 mm diameter, 179.5 ± 3 turns, wound core.	
3.3	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	
3.4	Insulation Tube	YDPU2	Various	Various	Flexible heat shrinkable polyolefin tubing, rated min. 600 V, 125 °C intended to wrap around a body.	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)IG (I)LL
4	PFC (LP101)	-	-	-	Refer to Ill. 11 for details.	I11
4.1	Core	-	-	-	Ferrite, EE type, overall approx. 20.05 x mm by 10.75 mm by 18.10 mm (L x W x H).	
4.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C, wound pins #2 and #6.	
		OBJT2	Various	Various	Triple insulated wire, rated min. 130 °C, wound pins #1 and #8.	
4.3	Bobbin	QMFZ2	MOMENTIVE SPECIALTY CHEMICALS GMBH (E61040)	PF2736(a)(b)	Phenolic (PF), 0.46 mm thick min., rated V-0, 150 °C.	
4.4	Insulation Tape / Core Fixing Tape	OANZ2	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD (E165111)	CT	Polyethylene terephthalate film tape, min. 0.025 mm thick per layer rated min. 130 °C.	
	Alternate	OANZ2	SYMBIO INC (E50292)	35660	Same as above.	
4.5	Barrier Tape	OANZ2	Various	Various	Rated min. 130 °C.	
4.6	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	
5	Choke coil (LX103S) - primary circuit	-	-	-	Refer to Ill. 12 for details.	I12
5.1	Core	-	-	-	Ferrite, drum type, overall approx. 8.0 mm by 13.2 mm (diameter x height).	
5.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C. Overall 0.25 mm diameter, 179.5 ± 3 turns, wound core.	
5.3	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	
5.4	Insulation Tube	YDPU2	Various	Various	Flexible heat shrinkable polyolefin tubing, rated min. 600 V, 125 °C, intended to wrap around a body.	

## and Report

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)I G (I)L L
6	Drive Transformer (PT101) - Primary circuit	-	-	-	Refer to Ill. 13 for details.	I13
6.1	Core	-	-	-	Ferrite, EE type, overall approx. 10.30 mm by 11.05 mm by 4.75 mm (L x W x H).	
6.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C.	
6.3	Insulation Tube	YDPU2	Various	Various	Not heat-shrinkable polytetrafluoroethylene (PTFE) tubing, rated min. 150 V, 200 °C for pin #3.	
	Alternate	QMFZ2	Various	Various	Polytetrafluoroethylene (PTFE), rated min. V-0, 180 °C for pin #3.	
6.4	Bobbin	QMFZ2	MOMENTIVE SPECIALTY CHEMICALS GMBH (E61040)	PF2736(a)(b)	0.46 mm thick min., rated V-0, 150 °C.	
	Alternate	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	PM-9820	0.16 mm thick min., rated V-0, 150 °C.	
	Alternate	QMFZ2	CHANG CHUN PLASTICS CO LTD (E59481)	T375J	0.45 mm thick min., rated V-0, 150 °C.	
6.5	Insulation Tape / Core Fixing Tape	OANZ2	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD (E165111)	CT, PZ	Polyethylene terephthalate film tape, min. 0.025 mm thick per layer rated min. 130 °C.	
	Alternate	OANZ2	DUCK SUNG HITECH CO LTD (E105147)	DTS-204	Same as above.	
	Alternate	OANZ2	METAL LINE CO LTD (E162848)	800, 800BT	Same as above.	
6.6	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Description / Technical Data	(F)IG (I)LL
7	Choke coil (LM101) - Secondary circuit	-	-	-	Refer to Ill. 14 for details.	I14
7.1	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C. Overall 0.40 mm diameter, 23.5 ± 1 turns, wound core.	
7.2	Core	-	-	-	Ferrite, drum type, overall approx. 6.5 mm by 7.5 mm (diameter x height).	
7.3	Base	QMFZ2	Various	Various	0.46 mm thick min., rated V-0, 150 °C.	
7.4	Insulation Tube	YDPU2	Various	Various	Flexible heat shrinkable polyolefin tubing, rated min. 600 V, 125 °C intended to wrap around a body.	
8	Transformer (TM101)- isolated primary to secondary	-	-	-	Refer to Ills. 15 and 16 for detailed construction and insulation system (Class 130 (B) information).	
	Electrical insulation system	OBJY2	CLOVER HI-TECH CO LTD (E167514)	<b>SC-04B</b>	Rated Class 130 (Class B).	I15
	Alternate	OBJY2	LITE-ON TECHNOLOGY CORP (E140167)	<b>LSE-B11</b>	Same as above.	I16
8.1	Core	-	-	-	Ferrite, EER type, overall approx. 30.9 mm by 38.0 mm by 11.4 mm (L x W x H).	
8.2	Coil	OBMW2	Belong to electrical insulation system	Belong to electrical insulation system	Enameled copper wire, rated min. 130 °C, windings separated from each other by bobbin.	
8.3	Bobbin	QMFZ2	SUMITOMO BAKELITE CO LTD (E41429)	PM-9820	Phenolic (PF), 0.65 mm thick min., rated V-0, 150 °C.	
8.4	Cap	QMFZ2	NAN YA PLASTICS CORP PLASTICS 4TH DIV (E130155)	1403G6	Polybutylene Terephthalate (PBT), 0.75 mm thick min., rated V-0, 130 °C.	
8.5	Core fixing tape	OANZ2	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD (E165111)	CT	Polyethylene terephthalate film tape, rated min. 130 °C, min. 0.025 mm thick per layer.	
8.6	Varnish	OBOR2	Belong to electrical insulation system	Belong to electrical insulation system	Rated min. 130 °C.	