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REPORT

on

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

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DESCRIPTION

PRODUCT COVERED:

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

ELECTRICAL RATINGS:

Model No.	Input			Output		
	Voltage (Vac)	Frequency (Hz)	Current (A)	Voltage (Vdc)	Frequency (Hz)	Current (A)
PSDV250701A, PSDV250701B	120-240	50/60	0.35	34.0	N/A	0.7
PSDV220571A, PSDV220571B	110-240	50/60	0.35	34.0	N/A	0.57
PSDV200701A, PSDV200701B	110-240	50/60	0.35	25.0	N/A	0.7
PSDV170571A, PSDV170571B, PSDV170571F, PSDV170571C, PSDV170571E	110-240	50/60	0.35	25.0	N/A	0.57

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

USR - Indicates investigation to the United States Standards for Light Emitting Diode (LED) Light Equipment for Use in Lighting Products, UL 8750. 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. 250.13-12. The output has been evaluated as extra low voltage Class 2, Clause 8.12.1.

DIFFERENCES BETWEEN MODELS:

* 1. Models PSDV250701B, PSDV220571A, PSDV220571B, PSDV200701A, PSDV200701B, PSDV170571A, PSDV170571B, **PSDV170571F**, PSDV170571C and **PSDV170571E** are identical to model PSDV250701A except model designation, electrical ratings and a few components detailed below Table I.

* 2. Models PSDV220571A, PSDV220571B, PSDV250701A and PSDV250701B have same transformer, models PSDV200701A, PSDV200701B, PSDV170571A, PSDV170571B, **PSDV170571F**, PSDV170571C and **PSDV170571E** have same transformer.

3. Type of output connections for all models is given in the Table II.

Table I

Location No.	Specification				
	PSDV250701A, PSDV250701B	PSDV220571A, PSDV220571B	PSDV200701A, PSDV200701B	PSDV170571A	PSDV170571B, PSDV170571F , PSDV170571C, PSDV170571E
T01	FF25-FM	FF25-FM	FF20A-FM	FF20A-FM	FF20A-FM
CX1	150 nF	150 nF	100 nF	100 nF	100 nF
LF1	4 mH	5 mH	4 mH	4 mH	4 mH
CP1	220 nF	150 nF	100 nF	100 nF	100 nF
R04	750 ohm	680 ohm	680 ohm	750 ohm	680 ohm
C06	20 pF	20 pF	10 pF	10 pF	10 pF
R52	1.7 ohm	2.1 ohm	1.7 ohm	2.1 ohm	2.1 ohm
LX1	30uH	30uH	30uH	30uH	100uH
LX3	180uH	180uH	180uH	180uH	No component
C71	22uF	22uF	22uF	22uF	No component
C61	No component	No component	No component	No component	10uF
C73	180uF	180uF	180uF	180uF	100uF
CY1	3.3nF	3.3nF	3.3nF	3.3nF	1.0nF
Heat Sink for Q01, Q02	Be provided	Be provided	Be provided	Be provided	No component

Table II

Type of Output Connections	Push-In Terminal Block	Connector
Model Nos.	PSDV250701A, PSDV220571A, PSDV200701A, PSDV170571A, PSDV170571C, PSDV170571E	PSDV250701B, PSDV220571B, PSDV200701B, PSDV170571B, PSDV170571F

Conditions of Acceptability:

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

1. These products been evaluated for the following characteristics.

Model No. [x] applies to all models			Product is rated	Type HL (b)
PSDV250701A, PSDV250701B, PSDV220571A, PSDV220571B, PSDV200701A, PSDV200701B, PSDV170571A, PSDV170571B, PSDV170571F , PSDV170571C, PSDV170571E	Input type- Branch Circuit (Mains)	Output type- CC Output is Class 2 (a)	Damp	No

a- As defined in UL 8750, Clause 7.12.1 and CAN/CSA-C22.2 No. 250.13-12, Clause 8.12.1

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

2. Rated output loading for these products was achieved using electronic loads and LED loads. The need for other consideration should be considered in end-use product.

*3. The temperature tests were performed at nominal 50 °C ambient (T_{ma}). The 77.3 °C for models PSDV250701A and PSDV250701B, 56.3 °C for models PSDV220571A and PSDV220571B, 61.2 °C for models PSDV200701A, PSDV200701B and PSDV170571A, 74.3 °C for models PSDV170571B, **PSDV170571F**, PSDV170571C and **PSDV170571E** maximum ambient temperature was then calculated based on temperatures observed during testing and temperature ratings of the integral components including the electrical insulation system. During the normal temperature test of the end product, the temperature at the temperature reference point (T_c) is to be monitored. The absolute value at the temperature reference point (Case surface above L01 and/or T01) cannot exceed 86.7 °C for models PSDV250701A and PSDV250701B, 80 °C for models PSDV220571A, PSDV220571B, PSDV200701A, PSDV200701B and PSDV170571A, 85.1 °C for models PSDV170571B, **PSDV170571F**, PSDV170571C and **PSDV170571E**.

4. These products utilize a UL Recognized OBJ2 Class 130 (B) electrical insulation system.

5. These products are 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.

6. These products are 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, and these products are provided with push-in terminals for load connection. These terminals are intended for use with 18-22 AWG stranded copper conductors with 8.5 mm ~ 9.5 mm strip length.

Conditions of Acceptability: (CONT'D)

7. **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.**
8. 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.
9. The input and output connections have been invested for factory wiring only, connection to supply mains shall be determined in the end product.
10. The grounding means shall be considered in each end use application.
11. 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.**
12. Outer Case have not been invested for final enclosure, the suitable enclosure shall be provided in the end-use product.
13. The input and output terminal 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.
14. **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.).**

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 - R/C (ZPMV2, rated V-0, suitable for the solder time and temperature used by the manufacturer and having an operating temperature rating of at least 130 °C.

"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, if more than one location.
4. Date Code.

Mean Digit	Plant	Year	Month	Date	Model Code	Serial No
2		2	1	2	3	4
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: Class 2 output.
7. Optional - Environmental considerations: Suitable for Dry and Damp locations only.
8. Optional - Polarity of the Input and Output Connections.
- * 9. Optional - Maximum ambient temperature (Tma): 77.3 °C for models PSDV250701A and PSDV250701B, 56.3 °C for models PSDV220571A and PSDV220571B, 61.2 °C for models PSDV200701A, PSDV200701B and PSDV170571A, 74.3 °C for models PSDV170571B, **PSDV170571F**, PSDV170571C and **PSDV170571E**.

Model PSDV250701A - FIGS. 1 THRU 4.

(Model PSDV250701A represents models PSDV220571A, PSDV200701A, PSDV170571A, PSDV170571C, **PSDV170571E**)

Model PSDV170571B - FIGS. 5.

(Model PSDV170571B represents models PSDV250701B, PSDV220571B, PSDV200701B, **PSDV170571F**)

General - The general design, shape and arrangement shall be as illustrated except where variations are specifically described. Detailed model difference needs to refer to page 1.

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
1	Top/Sides Case	QMFZ2	CHEIL INDUSTRIES INC CHEMICALS DIV (E115797)	HN-1064(+)	Polycarbonate (PC), rated 130 °C, V-0, measured approx. 94.5 mm by 39.5 mm by 31.0 mm (L x W x H), 1.60 mm thick minimum. Secured together by snap-in fit.	F1 I1
	Alternate	QMFZ2	SAMYANG CORPORATION (E121254)	3025GR(y)	Same as above except for rated 115 °C.	
2	Bottom Case	QMFZ2	CHEIL INDUSTRIES INC CHEMICALS DIV (E115797)	HN-1064(+)	Polycarbonate (PC), rated 130 °C, V-0, measured approx. 91.3 mm by 36.3 mm by 4.35 mm (L x W x H), 1.95 mm thick minimum. Secured together by snap-in fit.	F2 I2
	Alternate	QMFZ2	SAMYANG CORPORATION (E121254)	3025GR(y)	Same as above except for rated 115 °C.	
3	Input Push- In Terminal Block (CN1)	XCFR2 , CN	DEGSON ELECTRONICS CO LTD (E228872)	DG250-3.5*h	Rated min. 300 V, 7 A, 105 °C, acceptable for field wiring 18 AWG, Copper conductor.	
4	Output Push- In Terminal Block (CN2)	XCFR2 , CN	DEGSON ELECTRONICS CO LTD (E228872)	DG250-3.5*h	Rated min. 300 V, 7 A, 105 °C, acceptable for field wiring 18-22 AWG, Copper conductor for models PSDV250701A, PSDV220571A, PSDV200701A, PSDV170571A, PSDV170571C, PSDV170571E .	
4A	Output Connector (CN3)	ECBT2 , CN	Various	Various	Rated min. 250 V ac/dc, min. 2.75 A. Located on Class 2 circuit. For models PSDV250701B, PSDV220571B, PSDV200701B, PSDV170571B, PSDV170571F .	
5	Printed Wiring Board	ZPMV2 , CN	Various	Various	Rated min. 130 °C, V-0. Measured approx. 90.4 mm by 35.6 mm (L x W), 1.6 mm thick.	I3
6	Fuse (F01)	JDYX2 , CN	LITTELFUSE WICKMANN WERKE (E67006)	369 +	Rated 3.15 A, 300 Vac, connected in series with ungrounded supply.	
	Alternate	JDYX2 , CN	CONQUER ELECTRONICS CO LTD (E82636)	MST	Same as above.	

Model PSDV250701A - FIGS. 1 THRU 4. (CONT'D)

Model PSDV170571B - FIGS. 5. (CONT'D)

No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
7	Capacitor (CX1)	FOKY2 or FOWX2, CN	Various	Various	Rated 150 nF, min. 275 Vac, min. 100 °C. Located across the line.	
8	Capacitor (CY1)	FOWX2, CN	Various	Various	Rated 3.3 nF, min. 400 Vac, min. 125 °C. Class Y1. Located primary to secondary.	
9	Varistor (VAR1)	VZCA2, CN	Various	Various	Rated min. 300 Vac, intended use type 3 SPD applications.	
10	Bridge Diode (BD1)	-	Various	Various	Rated 600 V min., 2.0 A max.	
11	FET (Q02)	-	Various	Various	Rated 650 V min., 7 A max.	
12	Heat Sink for Q01, Q02	-	Various	Various	Aluminum, measured overall 34.2 mm by 21.5 mm (L x W), 1.0 mm thick minimum. Secured to Q01, Q02 by a screw.	
13	Electrolytic Capacitor (C71)	-	Various	Various	Rated 22 uF, min. 450 V, min. 105 °C.	
14	Film Capacitor (CP1)	-	Various	Various	Rated 220 nF, min. 450 V, min. 105 °C.	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F) IG (I) LL
1	Line Filter (LX1)	-	-	-	Refer to Ill. 4 (for all models except models PSDV170571B, PSDV170571F , PSDV170571C, PSDV170571E) for details.	I4
1.1	Core	-	-	-	Ferrite, toroidal type, overall 8.0 mm by 4.0 mm by 3.0 mm (OD x ID x H).	
1.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C, wire ends secured to PWB by soldering.	
	Coil	OBJT2 or AVLV2/ CN	Various	Various	Insulated winding wire, rated min. 130 °C, wire ends secured to PWB by soldering.	
1.3	Base	QMFZ2	Various	Various	Phenolic, rated min. 150 °C, 0.46 mm.	
1A	Line Filter (LX1)	-	-	-	Refer to Ill. 12 and 12A for details for models PSDV170571B, PSDV170571F , PSDV170571C, PSDV170571E .	I12, I12A
1.1 A	Core	-	-	-	Ferrite, toroidal type, overall 8.1 mm by 4.1 mm by 3.1 mm (OD x ID x H).	
1.2 A	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C, wire ends secured to PWB by soldering.	
	Coil	OBJT2 or AVLV2/ CN	Various	Various	Insulated winding wire, rated min. 130 °C, wire ends secured to PWB by soldering.	
1.3 A	Base	QMFZ2	MOMENTIVE SPECIALTY CHEMICALS GMBH (E61040)	PF2736(a) (b)	Phenolic, rated min. 150 °C, 0.46 mm.	
	Base	QMFZ2	CHANG CHUN PLASTICS CO LTD (E59481)	T375HF	Phenolic, rated min. 150 °C, 0.43 mm.	
	Base	QMFZ2	SUMITOMO BAKELITE CO LTD (41429)	PM-9820	Phenolic, rated min. 150 °C, 0.51 mm.	
1.4 A	Tube	YDPU2, CN	Various	Various	Rated VW-1, Max. 200 °C, Min. 300 V, used to beginning and end points of #2 and #4 wires.	

Winding devices - See below for details. (Cont'd)

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F)IG (I)LL
2	Line Filter (LX2)	-	-	-	Refer to Ill. 5 for details.	I5
2.1	Core	-	-	-	Ferrite, toroidal type, overall 13.0 mm by 7.0 mm by 5.0 mm (OD x ID x H).	
2.2	Coil	OBMW2	Various	Various	Enameled copper wire, two provided, each rated min. 130 °C.	
2.3	Coil Separator	QMFZ2	Various	Various	Rated min. 105 °C, 0.4 mm thick.	
2.4	Base	QMFZ2	Various	Various	Phenolic, rated min. 150 °C, 0.46 mm.	
3	Choke Coil (LF1)	-	-	-	Refer to Ill. 6 (models PSDV250701A, PSDV250701B, PSDV200701A, PSDV200701B, PSDV170571A, PSDV170571B, PSDV170571F , PSDV170571C, PSDV170571E), and Ill. 6A (models PSDV220571A, PSDV220571B) for details.	I6, I6A
3.1	Core	-	-	-	Ferrite, drum type, measured overall 8.0 mm by 11.0 mm (diameter x height).	
3.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C, wire ends secured to PWB by soldering.	
3.3	Base	QMFZ2	Various	Various	Phenolic, rated min. 150 °C, 0.46 mm.	
3.4	Tube	YDPU2, CN	Various	Various	Rated VW-1, Max. 125 °C, 600 V, intended to wrap round a body.	

Winding devices - See below for details. (Cont'd)

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F)IG (I)LL
4	PFC Coil (L01)	-	-	-	Refer to Ill. 7 for details.	I7
4.1	Core	-	-	-	Ferrite, EE type, measured overall 14.0 mm by 14.0 mm by 7.0 mm (L x H x W).	
4.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C.	
	Coil	OBJT2	Various	Various	Insulated winding wire, rated min. 130 °C.	
4.3	Bobbin	QMFZ2	Various	Various	Phenolic, rated min. 150 °C, 0.51 mm thick.	
4.4	Insulation Tape	OANZ2	Various	Various	Polyethylene terephthalate film tape, rated min. 130 °C.	
4.5	Varnish	OBOR2	Various	Various	Rated min. 130 °C.	
5	Secondary Line Filter (LX3)	-	-	-	Refer to Ill. 8 for details.	I8
5.1	Core	-	-	-	Ferrite, toroidal type, overall 8.1 mm by 4.1 mm by 3.1 mm (OD x ID x H).	
5.2	Coil	OBMW2	Various	Various	Enameled copper wire, rated min. 130 °C, wire ends secured to PWB by soldering.	
	Coil	OBJT2 or AVLV2/ CN	Various	Various	Insulated winding wire, rated min. 130 °C.	
5.3	Base	QMFZ2	Various	Various	Phenolic, rated min. 150 °C, 0.46 mm.	
5.4	Tube	YDPU2, CN	Various	Various	Rated VW-1, Max. 200 °C, 150 V, used to beginning and end points of an Insulated winding wire.	
6	Transformer (T01)	-	-	-	Refer to Ills. 9 and 10 (models PSDV250701A, PSDV250701B, PSDV220571A, PSDV220571B), Ills 9A and 10A (models PSDV200701A, PSDV200701B, PSDV170571A, PSDV170571B, PSDV170571F , PSDV170571C, PSDV170571E) for details and refer to insulation system for detailed materials.	
	Electrical insulation system	OBJY2	JINLONG MACHINERY & ELECTRONICS CO LTD (E342835)	JLS.02	Rated Class 130 (B) electrical insulation system.	I9, I9A
	Electrical insulation system	OBJY2	YAO SHENG ELECTRONIC CO LTD (E173643)	YCI-130	Rated Class 130 (B) electrical insulation system.	I10, I10A
6.1	Insulation Tape	OANZ2	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD (E165111)	CT	Polyethylene terephthalate film tape, 0.025 mm thick. Rated min. 130 °C.	

File E321686

Vol. 1

Sec. 16
and Report

Page 8

Issued: 2014-02-05
Revised: 2015-03-04

REPLACES ENTIRE PAGE 8

File E321686

Vol. 1

Sec. 16
and Report

Page 9

Issued: 2014-02-05
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REPLACES ENTIRE PAGE 9