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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)
PSDV160351A	100-240	50/60	0.35	40.0	N/A	0.35
PSDV160351B	100-240	50/60	0.35	40.0	N/A	0.35
PSDV130281A	100-240	50/60	0.35	40.0	N/A	0.285
PSDV130281B	100-240	50/60	0.35	40.0	N/A	0.285

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

DIFFERENCES BETWEEN MODELS:

Models PSDV160351B, PSDV130281A and PSDV130281B are identical to model PSDV160351A except model designation, electrical ratings and a few components detailed below table.

Location No.	Specification			
	PSDV160351A	PSDV160351B	PSDV130281A	PSDV130281B
CX1	100 nF	100 nF	68 nF	68 nF
LF1	4 mH	4 mH	5 mH	5 mH
R52	2.1 ohm	2.1 ohm	2.5 ohm	2.5 ohm
R04	750 ohm	750 ohm	680 ohm	680 ohm
C05	390 pF	390 pF	330 pF	330 pF
CS01	No component	No component	2.2 nF	2.2 nF
Output connector type	Push-In Terminal Block (CN2)	Connector (CN3)	Push-In Terminal Block (CN2)	Connector (CN3)

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 (c)	Type TL (d)
PSDV160351A, PSDV160351B, PSDV130281A, PSDV130281B	Input type- 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

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

3. As part of temperature testing, the case temperature at Tc (Case surface above L01) was monitored. During the normal temperature test of the end product, the temperature at Tc is to be monitored. The absolute value at Tc cannot exceed 80 °C designated by manufacturer based on calculated values by test (calculated value by test: 86.3 °C for models PSDV160351A and PSDV160351B, 88.6 °C for models PSDV130281A and PSDV130281B, these values were calculated based on temperatures observed during testing and temperature ratings of the integral components including the electrical insulation system).

4. These products utilize a UL Recognized OBJY2 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. All models 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, **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. And** models PSDV160351A and PSDV130281A 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. **The suitability of the use shall be determined in the end-product application.**

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.

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. The suitability of the use shall be determined in the end-product application.

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. 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.

15. 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.).

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

Mean	Plant	Year	Month	Date	Model Code	Serial No
Digit	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, 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: Suitable for Dry and Damp locations only.
8. Optional – Polarity of the Input and Output Connections.
9. Optional – Temperature Measurement Point (Tc).

Model PSDV160351A – FIG. 1 thru 4
Model PSDV160351B – FIG. 5
Model PSDV130281A – FIG. 6
Model PSDV130281B – FIG. 7

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	SAMSUNG SDI CO LTD (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 ºC.**	
2	Bottom Case	QMFZ2	SAMSUNG SDI CO LTD (E115797)	HN-1064(+)	Polycarbonate (PC), rated 130 °C, V-0, measured approx. 91.3 mm by 36.3 mm by 5.0 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 ºC.**	
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) for models PSDV160351A, PSDV130281A	XCFR2, CN	DEGSON ELECTRONICS CO LTD (E228872)	DG250-3.5*h	Rated min. 300 V, 7 A, acceptable for field wiring 18-22 AWG, Copper conductor. Located in Class 2/LVLE circuit.	
4A	Output Connector (CN3) for models PSDV160351B, PSDV130281B	ECBT2, CN	Various	Various	Rated min. 250 V ac/dc, 2.75 A. Located in Class 2/LVLE circuit.	
5	Printed Wiring Board	ZPMV2, CN	Various	Various	Rated min. 130 °C, V-0. Measured approx. 90.0 mm by 35.0 mm (L x W), 1.6 mm thick. Suitable for support of live parts.	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.	

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No.	Item	CCN	Manufacturer (File Number)	Part/Model Number	Description / Technical Data	(F)IG (I)LL
7	**Capacitor (CX1) for models PSDV160351A, PSDV160351B**	**FOKY2 or FOWX2, CN**	**Various**	**Various**	**Rated 100 nF, min. 275 Vac, min. 100 ºC. Located across the line.**	
7A	**Capacitor (CX1) for models PSDV130281A, PSDV130281B**	**FOKY2 or FOWX2, CN**	**Various**	**Various**	**Rated 68 nF, min. 275 Vac, min. 100 ºC. 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	AMOTECH CO LTD (E332687)	INR14D621	SPD Type 4 for use in Type 3 appications, minimum voltage rating 385 Vac.	
	Alternate	VZCA2, CN	THINKING ELECTRONIC INDUSTRIAL CO LTD (E314979)	TVR14621	SPD Type 4 for use in Type 3 appications, minimum voltage rating 395 Vac.	
10	Bridge Diode (BD1)	-	Various	Various	Rated 600 V min., 2.0 A max.	
11	FET (Q02)	-	Various	Various	Rated 650 V min., 4 A max.	
12	Electrolytic Capacitor (C61)	-	Various	Various	Rated 10 uF, min. 450 V, min. 105 °C.	
13	Film Capacitor (CP1)	-	Various	Various	Rated 100 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)- Primary	–	–	–	Refer to Ill. 4 for details.	I4
1.1	Core	–	–	–	Ferrite, toroidal type, overall 8.1 mm by 4.1 mm by 3.1 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. 130 °C, 0.46 mm.	
1.4	Tube	YDPU2	Various	Various	Rated VW-1, Max. 200 °C, 300 V, located at pin #2 and #4.	
2	Line Filter (LX2)- Primary	–	–	–	Refer to Ill. 5 for details.	I5
2.1	Core	–	–	–	Ferrite, toroidal type, overall 13.3 mm by 6.7 mm by 5.4 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. 130 °C, 0.46 mm.	
3	Choke Coil (LF1)- Primary	–	–	–	Refer to Ill. 6 for models PSDV160351A, PSDV160351B. Refer to Ill. 6A for models PSDV160351A, PSDV160351B.	I6, I6A
3.1	Core	–	–	–	Ferrite, drum type, overall 8.0 mm OD, 3.5 mm ID, 11.0 mm 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. 130 °C, 0.46 mm.	
3.4	Tube	YDPU2	Various	Various	Rated VW-1, Max. 125 °C, 600 V, intended to wrap round a body.	

Winding devices - See below for details.

No.	Item	CCN	Manufacturer (File Number)	Part Number	Rating	(F)IG (I)LL
4	PFC Coil (L01)- Primary	-	-	-	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. 130 °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	Transformer (T01)	-	-	-	Refer to Ills. 8 and 9 for details and refer to insulation system for detailed materials.	
	Electrical insulation system	OBJY2	NAM YANG ELECTRONICS CO LTD (E140149)	NYB-003	Rated Class 130 (B) electrical insulation system.	I8
	Electrical insulation system	OBJY2	YAO SHENG ELECTRONIC CO LTD (E173643)	YCI-130	Rated Class 130 (B) electrical insulation system.	I9
5.1	Core	-	-	-	Ferrite, EE type, measured overall 23.0 mm by 18.0 mm by 8.2 mm (L X W X H).	
5.2	Coil	OBMW2	Belong to electrical insulation system	Belong to electrical insulation system	Enameled copper wire, rated min. 130 °C.	
	Coil	OBJT2	Belong to electrical insulation system	Belong to electrical insulation system	Insulated winding wire, rated min. 130 °C.	
5.3	Bobbin	QMFZ2	Belong to electrical insulation system	Belong to electrical insulation system	Phenolic (PF), minimum 0.65 mm thick.	
5.4	Insulation Tape	OANZ2	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD (E165111)	CT	Polyethylene terephthalate film tape, 0.025 mm thick. Rated min. 130 °C.	
5.5	Varnish	OBOR2	Belong to electrical insulation system	Belong to electrical insulation system	Rated minimum 130 °C.	