



# Test Report: ODLC-45-700

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45W Constant Current Mode LED Driver

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

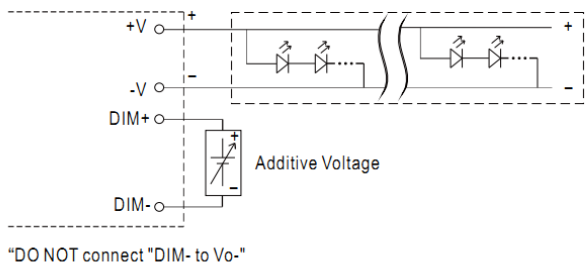
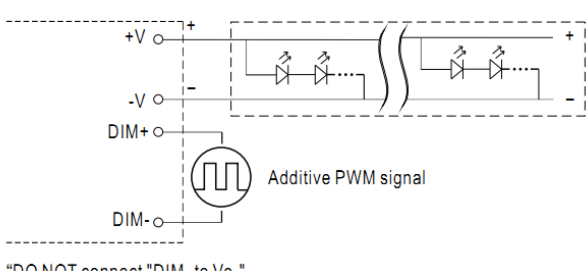
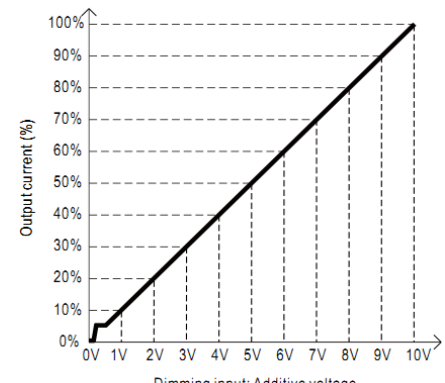
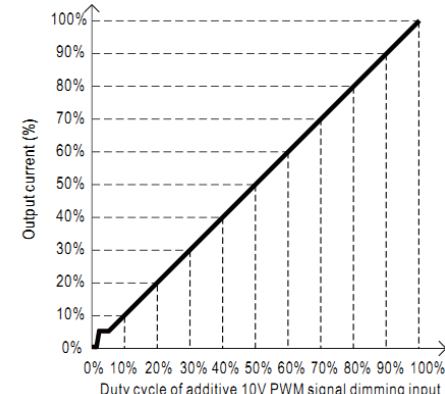
## ■ RELIABILITY TEST

Environment Test

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	38V~64V	I/P: 230VAC O/P: LED MODE Ta: 25°C	31V~67V
2	CURRENT RIPPLE	5% max@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	3.29%
3	CURRENT TOLERANCE	±7%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±2.85%
4	OPEN CIRCUIT VOLTAGE (max)	84V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	80.01V
5	OVER/UNDERSHOOT TEST	<±5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
6	SET UP TIME	500ms/230VAC 1200ms/115VAC	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	368ms/230VAC 390ms/115VAC
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> <p>Δ: 75.0 V @: 5.00 V Δ: 368ms @: -186ms</p> <p>Ch1 13.0 V Ch2 250 V M 100ms A Ch1 51.2 V</p> <p>50.00 %</p>		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> <p>Δ: 256 V @: -146 V Δ: 390ms @: -194ms</p> <p>Ch1 13.0 V Ch2 100 V M 100ms A Ch1 51.2 V</p> <p>50.00 %</p>		
7	AUXILIARY DC OUTPUT (A-Type only)	Nominal 12V (deviation 11.4~12.6) @50mA	I/P: 230 VAC O/P:FULL LOAD	12.01 V

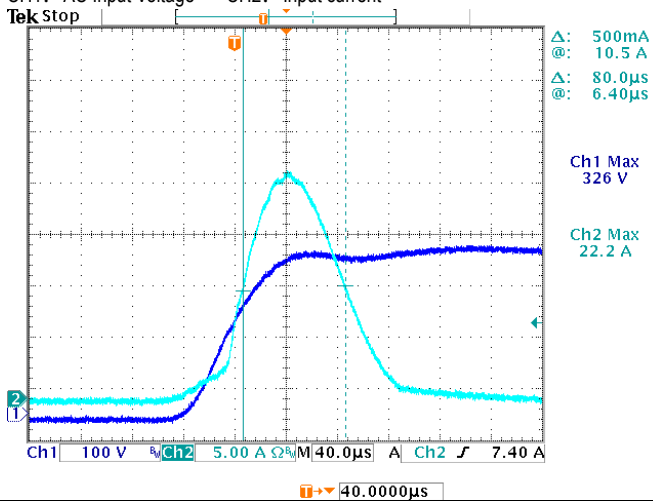
<p>8</p>	<p>DIMMING TEST(For Blank -Type)</p>	<ul style="list-style-type: none"> <li>• Output constant current level can be adjusted by applying one of the two methodologies between DIM+ and DIM-: 0 ~ 10Vdc, or 10V PWM signal.</li> <li>• Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.</li> </ul> <p>◎ Applying additive 0 ~ 10VDC</p>  <p>“DO NOT connect "DIM- to Vo-”</p> <p>◎ Applying additive 10V PWM signal (frequency range 300Hz ~ 3KHz):</p>  <p>“DO NOT connect "DIM- to Vo-”</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="1053 336 1500 716">  </div> <div data-bbox="1053 728 1500 1120">  </div> </div> <p>Note : 1. Min. dimming level is about 8% and the output current is not defined when 0% &lt; Iout &lt; 8%.          2. The output current could drop down to 0% when dimming input is about 0Vdc or 10V PWM signal with 0% duty cycle.</p> <p>I/P: 230 VAC          O/P: DIMMING TEST          Ta: 25°C</p> <table border="1" data-bbox="295 1299 1436 1702"> <tr> <td rowspan="3">1</td> <td>V</td> <td>0V</td><td>1V</td><td>2V</td><td>3V</td><td>4V</td><td>5V</td><td>6V</td><td>7V</td><td>8V</td><td>9V</td><td>10V</td> </tr> <tr> <td>Output Current</td> <td>0A</td><td>0.060</td><td>0.147</td><td>0.217</td><td>0.289</td><td>0.360</td><td>0.433</td><td>0.505</td><td>0.573</td><td>0.645</td><td>0.710</td> </tr> <tr> <td>%</td> <td>0.00%</td><td>8.57%</td><td>21.00%</td><td>31.00%</td><td>41.29%</td><td>51.43%</td><td>61.86%</td><td>72.14%</td><td>81.86%</td><td>92.14%</td><td>101.43%</td> </tr> <tr> <td rowspan="3">2</td> <td>PWM(100Hz)</td> <td>0%</td><td>10%</td><td>20%</td><td>30%</td><td>40%</td><td>50%</td><td>60%</td><td>70%</td><td>80%</td><td>90%</td><td>100%</td> </tr> <tr> <td>Output Current</td> <td>0A</td><td>0.060</td><td>0.149</td><td>0.220</td><td>0.290</td><td>0.360</td><td>0.431</td><td>0.500</td><td>0.571</td><td>0.641</td><td>0.704</td> </tr> <tr> <td>%</td> <td>0.00%</td><td>8.57%</td><td>21.29%</td><td>31.43%</td><td>41.43%</td><td>51.43%</td><td>61.57%</td><td>71.43%</td><td>81.57%</td><td>91.57%</td><td>100.57%</td> </tr> </table> <p>TEST RESULT: OK</p>	1	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	Output Current	0A	0.060	0.147	0.217	0.289	0.360	0.433	0.505	0.573	0.645	0.710	%	0.00%	8.57%	21.00%	31.00%	41.29%	51.43%	61.86%	72.14%	81.86%	92.14%	101.43%	2	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Output Current	0A	0.060	0.149	0.220	0.290	0.360	0.431	0.500	0.571	0.641	0.704	%	0.00%	8.57%	21.29%	31.43%	41.43%	51.43%	61.57%	71.43%	81.57%	91.57%	100.57%
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<p>9</p>	<p>DALI DIMMING OPERATION (primary side: for DA-Type)</p>	<p>※DALI Interface                  ·Apply DALI signal between DA+ and DA-.                  ·DALI protocol comprises 16 groups and 64 addresses.                  ·Firse step is fixed at 8% of output.</p> <p>I/P: 230 VAC                  O/P: DIMMING TEST                  Ta: 25°C                  TEST RESULT: OK</p>																																																																										

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~295VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	87V~305V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+10V=305 V O/P: FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230VAC ON: 0.5 Sec OFF: 0.5 Sec 20MIN ( POWER ON/OFF NO DAMAGE )	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 90 VAC ~295 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.6A/115VAC 0.4A/230VAC 0.3A/277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I =0.562A/ 115VAC I =0.234A/ 230VAC I =0.200A/ 277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-CASE: 0.0029 mA N-CASE: 0.0029 mA
5	NO LOAD/STANDBY POWER CONSUMPTION	< 0.5W for Blank-Type < 1.2W for A-Type < 0.5W for DA-Type	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.349W for Blank-Type 0.463W for A-Type 0.446W for DA-Type
6	INRUSH CURRENT(Typ)	230V/ 30A Twidth =100 us measured at 50% Ipeak COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I =22.2A/ 230VAC Twidth =80us

INPUT=230VAC/50HZ @ FULL LOAD

CH1: AC Input Voltage CH2: Input current



7	EFFICIENCY(Typ)	85%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	89.2%																												
<p><b>EFFICIENCY vs LOAD</b></p> <table border="1"> <caption>Efficiency vs Load Data</caption> <thead> <tr> <th>LOAD</th> <th>277V</th> <th>230V</th> <th>115V</th> </tr> </thead> <tbody> <tr> <td>50%</td> <td>83.0</td> <td>84.0</td> <td>84.5</td> </tr> <tr> <td>60%</td> <td>85.0</td> <td>86.0</td> <td>86.0</td> </tr> <tr> <td>70%</td> <td>86.5</td> <td>87.5</td> <td>87.0</td> </tr> <tr> <td>80%</td> <td>88.0</td> <td>88.5</td> <td>87.5</td> </tr> <tr> <td>90%</td> <td>89.0</td> <td>89.0</td> <td>88.0</td> </tr> <tr> <td>100%</td> <td>89.2</td> <td>89.2</td> <td>88.0</td> </tr> </tbody> </table>					LOAD	277V	230V	115V	50%	83.0	84.0	84.5	60%	85.0	86.0	86.0	70%	86.5	87.5	87.0	80%	88.0	88.5	87.5	90%	89.0	89.0	88.0	100%	89.2	89.2	88.0
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8	POWER FACTOR	0.95/ 115VAC 0.92/ 230VAC 0.90/ 277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.99/ 115VAC PF=0.978/ 230VAC PF=0.95/ 277VAC																												
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9	TOTAL HARMONIC DISTORTION	THD<20% ( @load≥60%/115VAC, 230VAC; @load≥75%/277VAC)	I/P: 115 VAC/60% LOAD I/P: 230 VAC/60% LOAD I/P: 277 VAC/75% LOAD Ta: 25°C	THD=5.79% @60% load /115VAC THD=7.47% @60% load /230VAC THD=9.34% @75% load /277VAC																												
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**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	SHORT CIRCUIT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 90VAC I/P: 295VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed

**COMPONENT STRESS TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Power Transistor	Q 1 Rated 800V/9A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 656V (2) 624V (3) 582V
2	O/P Diode (MOSFET)	D101 Rated 1000V/5A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 500V (2) 222V (3) 196V
3	Control IC	U1 Rated 35V (MAX)	I/P: High-Line +3V =298V O/P: (1) FULL LOAD (2) Output Short (3) Low Line No Load Ta: 25°C	(1) 14.8V (2) 14.7V (3) 14.7V
4	Clamp Diode	D 1 Rated 1000V/1A	I/P: High-Line +3V = 298V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 478V (2) 450V

**SAFETY TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.2 KVAC/min Ta: 25°C	I/P-O/P: 1.674mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500 VDC Ta: 25°C/70% RH	I/P-O/P: >9999MΩ

**E.M.C TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230 VAC/50HZ O/P: FULL/60% LOAD Ta: 25°C	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR: 8KV Contact: 4KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
7	Test by certified Lab & Test Report Prepare			

■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																												
1	TEMPERATURE RISE TEST	MODEL: ODL-45-700 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 32.5℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 53.7℃																																																														
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 295VAC/90VAC O/P: FULL/80% LOAD Ta= -25℃	TEST: OK																																																												
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=50 ℃ HUMIDITY= 95 %R.H	TEST: OK																																																												
4	TEMPERATURE COEFFICIENT	±0.03 %/℃(0~40℃)	I/P: 230 VAC O/P: FULL LOAD	±0.001%/℃																																																												
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -45℃~ +85℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 5 CYCLE 5. Input/Output condition: AC OFF STATIC		TEST: OK																																																												





6	THERMAL SHOCK TEST	1. Thermal shock Temperature: Tcase=-25°C~ +45°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 16 CYCLE 5. Input/Output condition: 230VAC/Full Load AC ON/OFF TEST AC on 3 sec/AC off 1 sec TEST	TEST: OK
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (3) Sweep Time: 10min/sweep cycle (4) Acceleration: 2G (5) Test Time: 60min in each axis (X.Y.Z) (6) Ta: 25°C	TEST: OK
8	CAPACITOR LIFE CYCLE	ODL-45-700: SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Ta= 25 °C LIFE TIME (2) I/P: 230VAC O/P: FULL LOAD Ta= 50 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 50 °C LIFE TIME (4) I/P: 230VAC O/P: MIN LOAD Ta= 50 °C LIFE TIME	(1) 555640 HRS (2) 84189 HRS (3) 99615 HRS (4) 107091 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 408.8K hrs min. MIL-HDBK-217F (25°C)	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 85°C ; 50,000 hours @ Tcase 75°C	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY