



Test Report: ODLC-45-1400

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

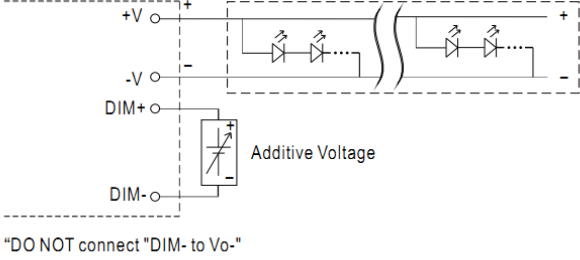
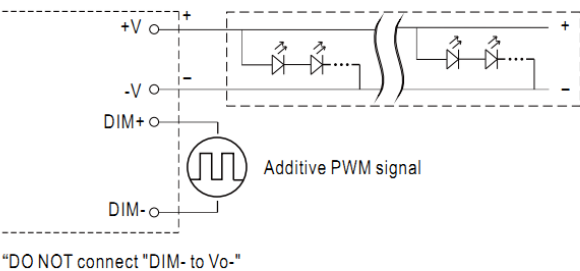
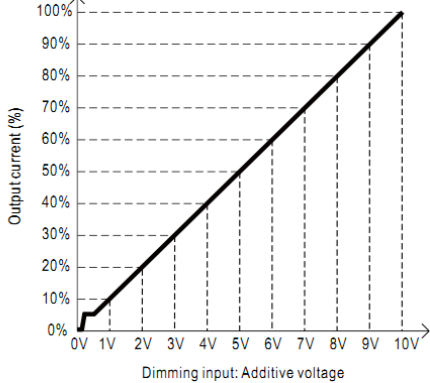
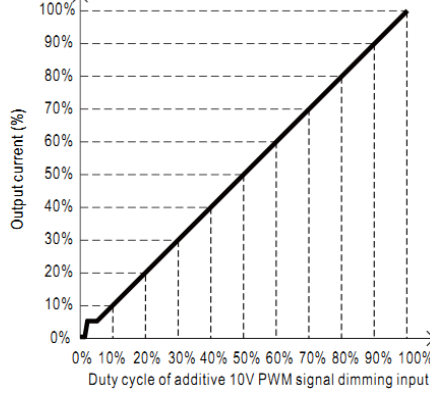
■ RELIABILITY TEST

Environment Test

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	19V~32V	I/P: 230VAC O/P: LED MODE Ta: 25°C	17V~34V
2	CURRENT RIPPLE	5% max@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	2.42%
3	CURRENT TOLERANCE	±7%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±0.71%
4	OPEN CIRCUIT VOLTAGE (max)	50V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	44.44V
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	430ms/230VAC 440ms/115VAC
<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> <p>50.00 %</p> </div> <div style="width: 45%;"> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> <p>50.00 %</p> </div> </div>				
7	AUXILIARY DC OUTPUT (A-Type only)	Nominal 12V (deviation 11.4~12.6) @50mA	I/P: 230 VAC O/P:FULL LOAD	11.95 V

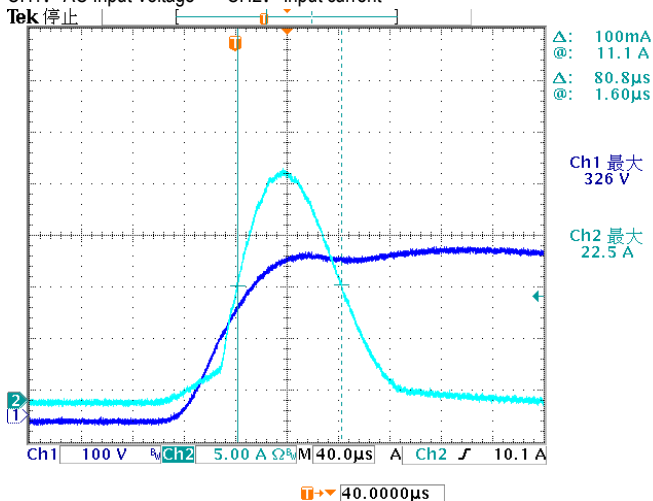
<p>8</p>	<p>DIMMING TEST(For -Type) Blank</p>	<ul style="list-style-type: none"> Output constant current level can be adjusted by applying one of the two methodologies between DIM+ and DIM-: 0 ~ 10Vdc, or 10V PWM signal. Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers. <p>◎ Applying additive 0 ~ 10VDC</p>  <p>◎ Applying additive 10V PWM signal (frequency range 300Hz ~ 3KHz):</p>  <div style="display: flex; justify-content: space-around;"> <div data-bbox="1101 347 1532 728">  </div> <div data-bbox="1101 739 1532 1131">  </div> </div> <p>Note : 1. Min. dimming level is about 8% and the output current is not defined when 0% < Iout < 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="331 1303 1471 1706"> <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>0.138</td><td>0.290</td><td>0.424</td><td>0.563</td><td>0.699</td><td>0.840</td><td>0.980</td><td>1.110</td><td>1.250</td><td>1.388</td> </tr> <tr> <td>%</td> <td>0.00%</td><td>9.86%</td><td>20.71%</td><td>30.29%</td><td>40.21%</td><td>49.93%</td><td>60.00%</td><td>70.00%</td><td>79.29%</td><td>89.29%</td><td>99.14%</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>0.145</td><td>0.294</td><td>0.432</td><td>0.566</td><td>0.703</td><td>0.837</td><td>0.970</td><td>1.107</td><td>1.243</td><td>1.365</td> </tr> <tr> <td>%</td> <td>0.00%</td><td>10.36%</td><td>21.00%</td><td>30.83%</td><td>40.44%</td><td>50.19%</td><td>59.79%</td><td>69.29%</td><td>79.07%</td><td>88.79%</td><td>97.50%</td> </tr> </table> <p>TEST RESULT: OK</p>	1	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	Output Current	0A	0.138	0.290	0.424	0.563	0.699	0.840	0.980	1.110	1.250	1.388	%	0.00%	9.86%	20.71%	30.29%	40.21%	49.93%	60.00%	70.00%	79.29%	89.29%	99.14%	2	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Output Current	0A	0.145	0.294	0.432	0.566	0.703	0.837	0.970	1.107	1.243	1.365	%	0.00%	10.36%	21.00%	30.83%	40.44%	50.19%	59.79%	69.29%	79.07%	88.79%	97.50%
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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. ·First 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 =0.446A/ 115VAC I =0.225A/ 230VAC I =0.194A/ 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	0.325W for Blank-Type 0.458W for A-Type 0.443W 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 =22.5A/ 230VAC Twidth =80.8us

INPUT=230VAC/50HZ @ FULL LOAD

CH1: AC Input Voltage CH2: Input current



7	EFFICIENCY(Typ)	83%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	86.41%																												
<p>EFFICIENCY vs LOAD</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>78.0</td> <td>79.0</td> <td>79.0</td> </tr> <tr> <td>60%</td> <td>80.5</td> <td>81.5</td> <td>81.0</td> </tr> <tr> <td>70%</td> <td>82.5</td> <td>83.5</td> <td>82.5</td> </tr> <tr> <td>80%</td> <td>84.0</td> <td>84.5</td> <td>83.5</td> </tr> <tr> <td>90%</td> <td>85.5</td> <td>86.0</td> <td>84.5</td> </tr> <tr> <td>100%</td> <td>86.0</td> <td>86.5</td> <td>85.0</td> </tr> </tbody> </table>					LOAD	277V	230V	115V	50%	78.0	79.0	79.0	60%	80.5	81.5	81.0	70%	82.5	83.5	82.5	80%	84.0	84.5	83.5	90%	85.5	86.0	84.5	100%	86.0	86.5	85.0
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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=0.985/ 115VAC PF=0.980/ 230VAC PF=0.949/ 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=10.35% @60% load /115VAC THD=11.62% @60% load /230VAC THD=9.04% @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) 758V (2) 752V (3) 720V
2	O/P Diode (MOSFET)	D100 Rated 400V/16A	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 246V (2) 253V (3) 242V
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) 15.0V (2) 14.6V (3) 14.5V
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) 494V (2) 484V

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: 1.630mA 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-45-1400 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	ODLIC-45-1400: 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) 661156 HRS (2) 116857 HRS (3) 133360 HRS (4) 152217 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 3513.4K hrs min. Telcordia SR-332 (Bellcore); 340.8K 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	Carychen/ZHUOKB	SKY	LIUWY