



# Test Report: ODLC-65-1050

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65W 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

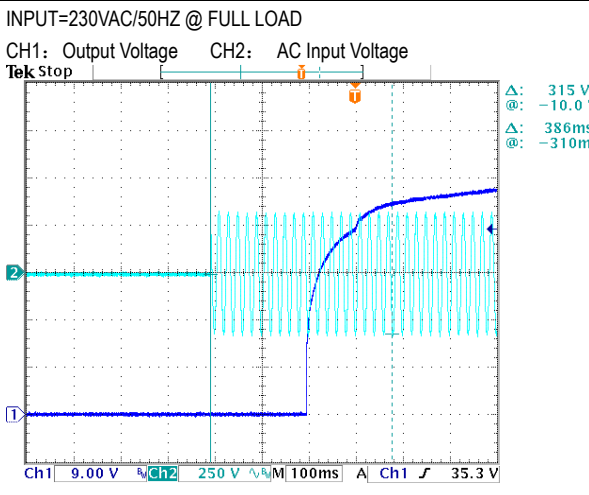
E.M.C. Test

## ■ RELIABILITY TEST

Environment Test

## DESIGN VERIFY TEST

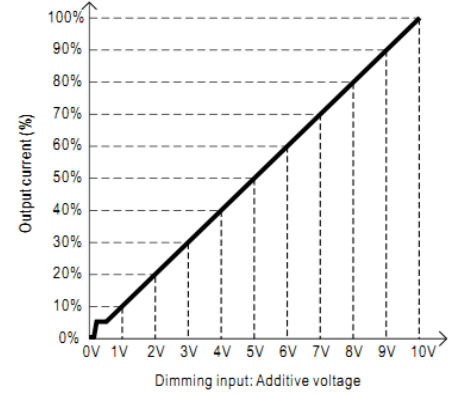
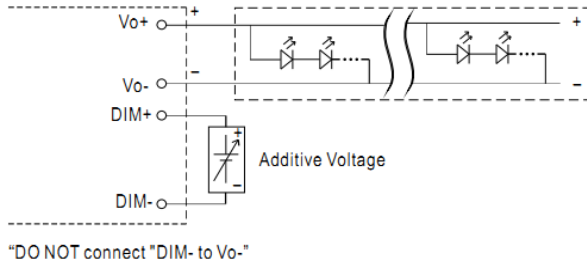
### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	46V~62V	I/P: 230VAC O/P: LED MODE Ta: 25°C	36 V~62 V
2	CURRENT RIPPLE	5% max@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	4.45%
3	CURRENT TOLERANCE	±7%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±2.14%
4	OPEN CIRCUIT VOLTAGE (max)	82V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	81.5 V
5	OVER/UNDERSHOOT TEST	<±5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5 %
6	SET UP TIME	500ms/230VAC	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	386 ms/230VAC
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  <p>Ch1 9.00 V Ch2 250 V 100ms A Ch1 35.3 V</p> <p>70.00 %</p>				
7	AUXILIARY DC OUTPUT (For A-Type only)	Nominal 12V (deviation 11.4~12.6) @50mA	I/P: 230 VAC O/P: FULL LOAD	11.96 V

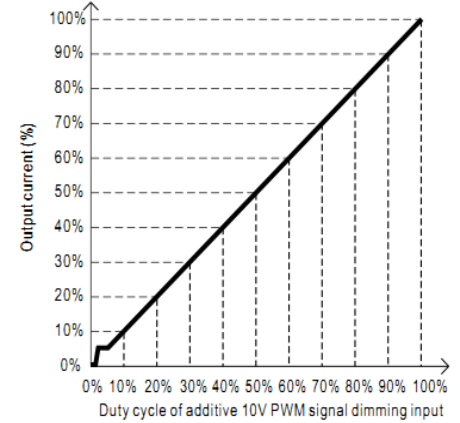
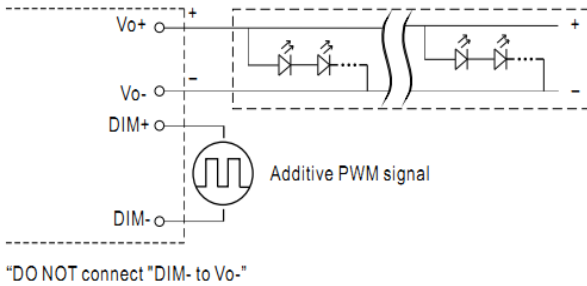
8 DIMMING TEST

SPEC:

- 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.
- © Applying additive 0 ~ 10VDC



© Applying additive 10V PWM signal (frequency range 300Hz ~ 3KHz):



- 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.

I/P: 230 VAC

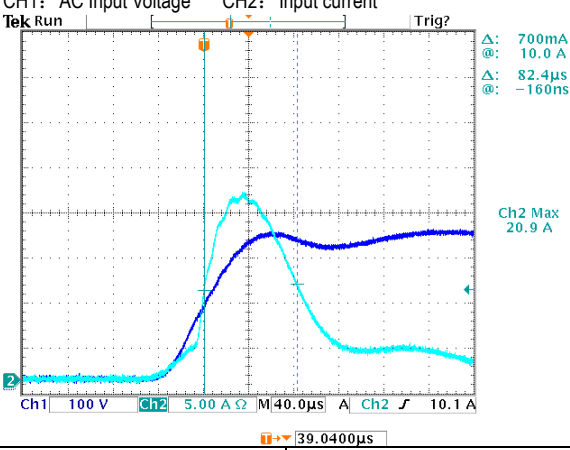
O/P: DIMMING TEST

Ta: 25°C

	V	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
1	Output Current	0A	0.1319A	0.2316A	0.3297A	0.4331A	0.5341A	0.6397A	0.7438A	0.8427A	0.9474A	1.0486A
	%	0.00%	12.56%	22.06%	31.40%	41.25%	50.87%	60.92%	70.84%	80.26%	90.23%	99.87%
	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2	Output Current	0A	0.1375A	0.2341A	0.3302A	0.4335A	0.5336A	0.6396A	0.7447A	0.8455A	0.9511A	1.0545A
	%	0.00%	13.10%	22.30%	31.45%	41.29%	50.82%	60.91%	70.92%	80.52%	90.58%	100.43%

TEST RESULT: OK

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~295VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	177V~305V
			I/P: (1)LOW-LINE-3V=177 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: 180 VAC ~295 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.4A/230VAC 0.3A/277VAC	I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I =0.323A/ 230VAC I =0.261A/ 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 POWER CONSUMPTION	< 0.5W for Blank-Type < 1.2W for A-Type	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.398W for Blank-Type 0.592W for A-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 =20.9A/ 230VAC Twidth =82.4 us
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: AC Input Voltage CH2: Input current</p>  <p>Ch1 100 V Ch2 5.00 A Ω   40.0µs A Ch2 10.1 A</p> <p>Ch2 Max 20.9 A</p> <p>39.0400µs</p>				
7	EFFICIENCY(Typ)	86%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	88.95%

<p><b>EFFICIENCY vs LOAD</b></p> <table border="1"> <caption>Efficiency vs Load Data</caption> <thead> <tr> <th>Load (%)</th> <th>277V Efficiency (%)</th> <th>230V Efficiency (%)</th> </tr> </thead> <tbody> <tr><td>50%</td><td>86.0</td><td>86.5</td></tr> <tr><td>60%</td><td>86.5</td><td>87.0</td></tr> <tr><td>70%</td><td>87.0</td><td>87.5</td></tr> <tr><td>80%</td><td>87.5</td><td>88.0</td></tr> <tr><td>90%</td><td>88.0</td><td>88.5</td></tr> <tr><td>100%</td><td>88.5</td><td>89.0</td></tr> </tbody> </table>				Load (%)	277V Efficiency (%)	230V Efficiency (%)	50%	86.0	86.5	60%	86.5	87.0	70%	87.0	87.5	80%	87.5	88.0	90%	88.0	88.5	100%	88.5	89.0
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8	POWER FACTOR	0.95/ 230VAC 0.90/ 277VAC	I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.982/ 230VAC PF=0.956/ 277VAC																				
<p><b>P.F vs LOAD</b></p> <table border="1"> <caption>P.F vs Load Data</caption> <thead> <tr> <th>Load (%)</th> <th>277V PF</th> <th>230V PF</th> </tr> </thead> <tbody> <tr><td>50%</td><td>0.91</td><td>0.95</td></tr> <tr><td>60%</td><td>0.92</td><td>0.96</td></tr> <tr><td>70%</td><td>0.93</td><td>0.965</td></tr> <tr><td>80%</td><td>0.94</td><td>0.97</td></tr> <tr><td>90%</td><td>0.95</td><td>0.975</td></tr> <tr><td>100%</td><td>0.96</td><td>0.98</td></tr> </tbody> </table>				Load (%)	277V PF	230V PF	50%	0.91	0.95	60%	0.92	0.96	70%	0.93	0.965	80%	0.94	0.97	90%	0.95	0.975	100%	0.96	0.98
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9	TOTAL HARMONIC DISTORTION	THD < 20% (@load ≥ 75% 230VAC; @load ≥ 75% 277VAC)	I/P: 230 VAC/75% LOAD I/P: 277 VAC/75% LOAD Ta: 25°C	THD=6.10% @75% load /230VAC THD=7.92% @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: 180VAC 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) 690V (2) 644V (3) 680V
2	O/P Diode (MOSFET)	D100 Rated 16A/600V	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 460V (2) 468V (3) 404V
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) 15.7V (2) 14.5V (3) 15.5V
4	Clamp Diode	D 1 Rated 800V/2A	I/P: High-Line +3V = 298V O/P: (1) Full Load input on/off (2) Output Short Ta: 25°C	(1) 550V (2) 494V

**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: 1.624 mA 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: > 9999 MΩ

**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/75% 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	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
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-65-1050 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 33.2℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 50.7℃																																																														
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 295VAC/180VAC 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 45 ℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=45 ℃ HUMIDITY= 95 %R.H	TEST: OK																																																												
4	TEMPERATURE COEFFICIENT	±0.03 %/℃(0~45℃)	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~ +85°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-65-1050: 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= 45 °C LIFE TIME (3) I/P: 230VAC O/P: MIN LOAD Ta= 45 °C LIFE TIME	(1) 587600 HRS (2) 133300 HRS (3) 144760 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 380.7K 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