



Test Report: IDPV-25-12

25W PWM Output LED Driver

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

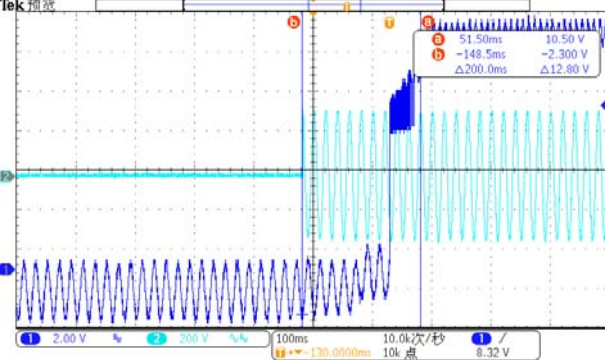
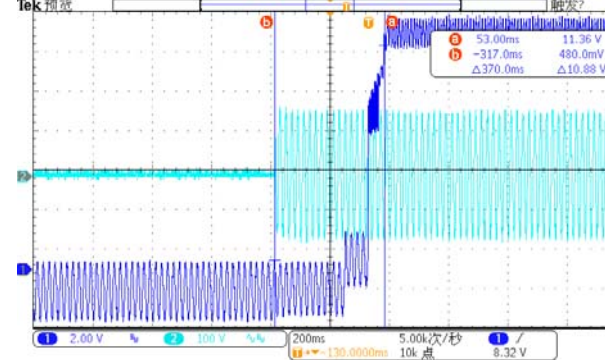
E.M.C. Test

■ RELIABILITY TEST

Environment Test

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM FREQUENCY	1KHz (±20%)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	1081Hz
2	VOLTAGE TOLERANCE	±10%	I/P: 90 VAC / 295 VAC O/P: 70%/FULL/ NO LOAD Ta: 25°C	-2.41%~5.51%
3	OVER/UNDERSHOOT TEST	<±10%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<±10%
4	SET UP TIME(Max)	500ms/230VAC 1200ms/115VAC	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	200ms/230VAC 370ms/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>  </div> <div style="width: 45%;"> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p>  </div> </div>				
5	AUXILIARY DC OUTPUT (For A-Type only)	Nominal 12V (deviation 11.4~12.6) @50mA	I/P: 230 VAC O/P: FULL LOAD	11.90V

6 DIMMING TEST

※ **Dimming principle for PWM style output**
 Dimming is achieved by varying the duty cycle of the output current.

Output DC current

$I_o=0A$

ON

OFF

T_{ON}

T

$$\text{Duty cycle(\%)} = \frac{T_{ON}}{T} \times 100\%$$

Output PWM frequency : 1KHz(±20%)

※ **2 in 1 dimming function**

◎ Applying additive 0 ~ 10VDC

Vo+ +

Vo- -

DIM+ +

DIM- -

Additive Voltage

"DO NOT connect "DIM- to Vo-"

◎ Applying additive 10V PWM signal (frequency range 300~3000Hz):

Vo+ +

Vo- -

DIM+ +

DIM- -

Additive PWM signal

"DO NOT connect "DIM- to Vo-"

Note : 1. Min. duty cycle of output current is about 8% and the output current is not defined when $0\% < I_{out} < 8\%$.
 2. The duty cycle of 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

1	Dimming voltage	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
	Output Current	0	0.16A	0.34A	0.53A	0.70A	0.88A	1.07A	1.26A	1.43A	1.61A	1.80A	1.80A
	Duty cycle of output current	0%	8.9%	18.9%	29.4%	38.9%	48.9%	59.4%	70.0%	79.4%	89.4%	100.0%	100.0%
2	Dimming Duty cycle	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output Current	0	0.17A	0.35A	0.52A	0.70A	0.87A	1.05A	1.22A	1.40A	1.57A	1.81A	1.80A
	Duty cycle of output current	0%	9.4%	19.4%	28.9%	38.9%	48.3%	58.3%	67.8%	77.8%	87.2%	100.6%	100.0%

TEST RESULT: OK

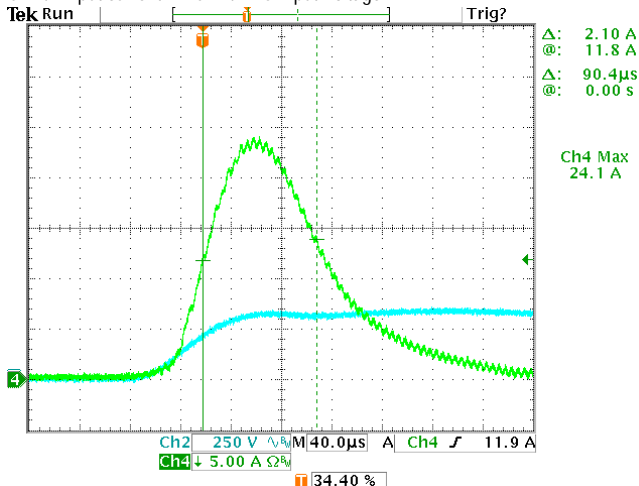


INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC-295VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	87V-295V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+10V=305 V O/P: FULL/NO 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-NO LOAD Ta: 25°C	TEST: OK
3	AC CURRENT	0.4A/115VAC 0.16A/230VAC 0.13A/277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	I = 0.2857A/ 115VAC I = 0.1431A/ 230VAC I = 0.1231A/ 277VAC
4	LEAKAGE CURRENT	< 0.75mA / 277VAC	I/P: 277 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.0045 mA N-FG: 0.0045 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	0.4095W for Blank-Type 0.4718W for A-Type
6	INRUSH CURRENT(Typ)	COLD START 30A/230VAC Twidth =150 us measured at 50% Ipeak	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=24.1 A/ 230VAC Twidth = 90.4us

INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



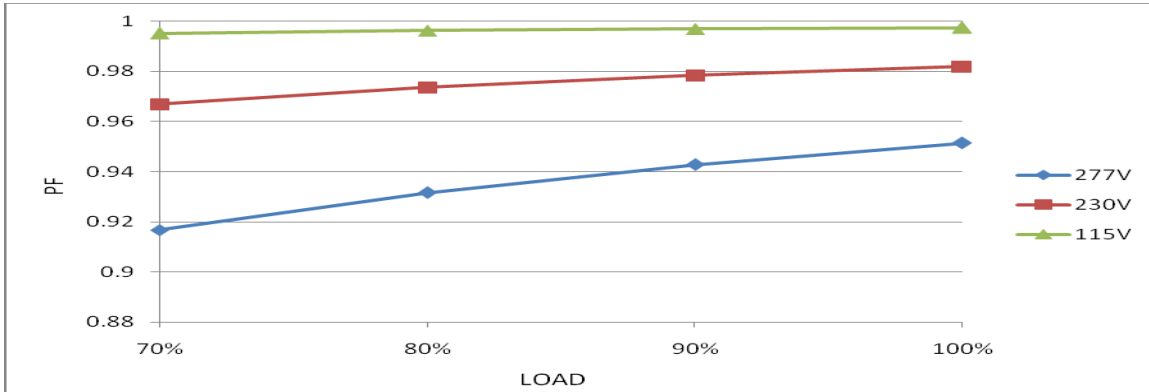


25W PWM Output LED Driver

IDPV-25 series

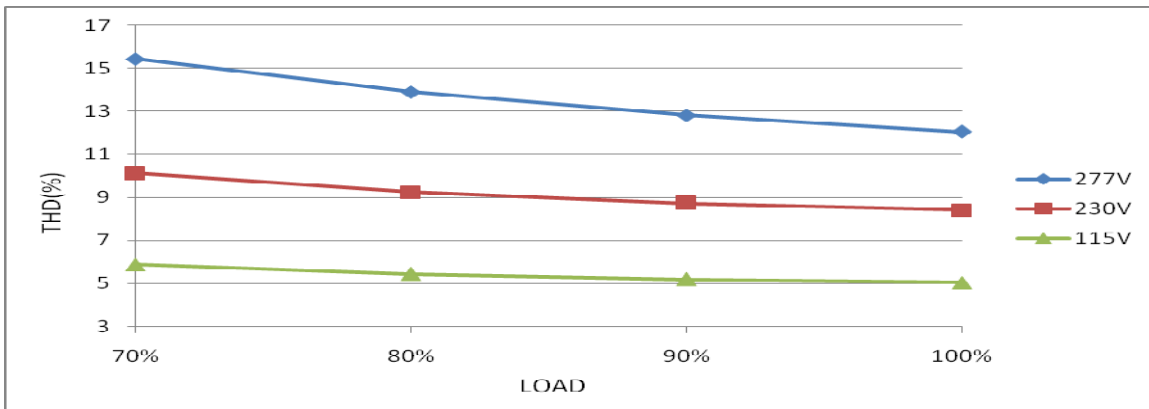
7	POWER FACTOR	0.95/ 115VAC 0.92/ 230VAC 0.9/ 277VAC	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: FULL LOAD Ta: 25°C	PF=0.997 /115VAC PF=0.982 /230VAC PF=0.951 /277VAC
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PF vs LOAD



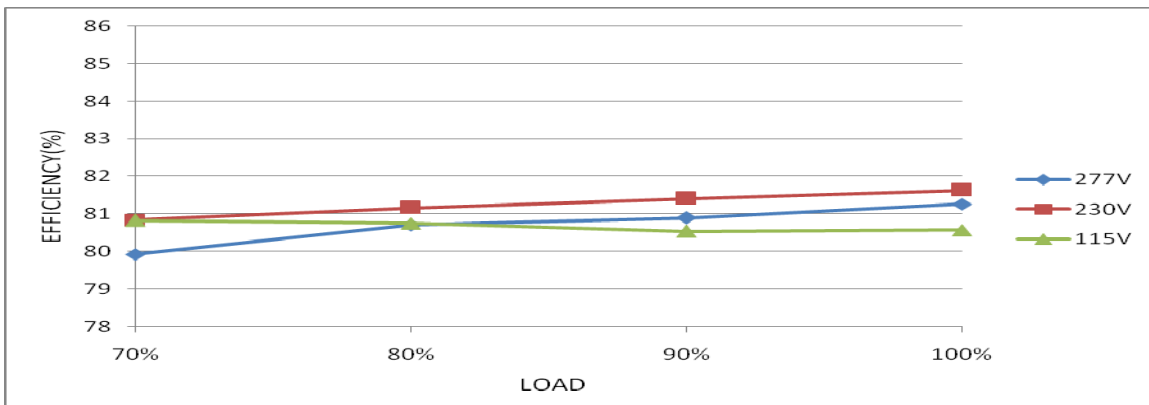
8	TOTAL HARMONIC DISTORTION	THD < 20% (@load ≥ 70%/115VAC, 230VAC; @load ≥ 75%/277VAC)	I/P: 115 VAC I/P: 230 VAC I/P: 277 VAC O/P: 70%/75% LOAD Ta: 25°C	THD=5.03% @70% load /115VAC THD=8.39% @70% load /230VAC THD=12.03% @75% load /277VAC
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THD vs LOAD



9	EFFICIENCY(Typ)	80%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	81.62%
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EFFICIENCY vs LOAD





PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	105 %~ 120 %	I/P: 100VAC I/P: 230VAC I/P: 295VAC O/P: TESTING Ta: 25°C	112%/ 100VAC 112%/ 230VAC 112%/ 295VAC Hiccup mode, recovers automatically after fault condition is removed
2	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 90VAC I/P: 295VAC O/P: 70%/FULL LOAD Ta: 25°C	NO DAMAGE Shut down O/P voltage, re-power on to recovery

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 7A/800V	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 704V (2) 704V (3) 656V
2	Diode Peak Voltage	D100 Rated 30A/100V	I/P: High-Line +3V =298V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 64.6V (2) 66.6V (3) 64.6V
3	Control IC Voltage Test	U1 Rated 35V	I/P: High-Line +3V =298V O/P: (1) Full Load input on/off (2) NO load input on /Off (3) Full Load /NO load Change Ta: 25°C	(1) 14.7V (2) 13.9V (3) 14.6V



SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.2KVAC/min Ta: 25°C	I/P-O/P: 1.708mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500VDC Ta: 25°C	I/P-O/P: >9999MΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2	I/P: 230VAC/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
3	RADIATION	EN55015	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY Air: 10KV Contact: 5KV	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: IDPV-25-12 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 25.9℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 46.1℃																																																																																		
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 25.9 ℃</th> <th>HIGH AMBIENT Ta=46.1 ℃</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>60.0℃</td><td>77.9℃</td></tr> <tr><td>2</td><td>L1</td><td>43.6℃</td><td>62.0℃</td></tr> <tr><td>3</td><td>RTH1</td><td>48.0℃</td><td>66.4℃</td></tr> <tr><td>4</td><td>C8</td><td>75.6℃</td><td>93.0℃</td></tr> <tr><td>5</td><td>C6</td><td>68.1℃</td><td>85.6℃</td></tr> <tr><td>6</td><td>Q1</td><td>73.4℃</td><td>91.6℃</td></tr> <tr><td>7</td><td>D1</td><td>91.1℃</td><td>109.5℃</td></tr> <tr><td>8</td><td>U1</td><td>70.1℃</td><td>88.0℃</td></tr> <tr><td>9</td><td>C16</td><td>72.6℃</td><td>90.6℃</td></tr> <tr><td>10</td><td>T1</td><td>82.6℃</td><td>99.3℃</td></tr> <tr><td>11</td><td>D100</td><td>90.3℃</td><td>107.2℃</td></tr> <tr><td>12</td><td>Q100</td><td>83.5℃</td><td>102.2℃</td></tr> <tr><td>13</td><td>U100</td><td>77.6℃</td><td>94.8℃</td></tr> <tr><td>14</td><td>RG1</td><td>90.3℃</td><td>108.2℃</td></tr> <tr><td>15</td><td>C206</td><td>71.0℃</td><td>89.9℃</td></tr> <tr><td>16</td><td>C105</td><td>61.7℃</td><td>79.7℃</td></tr> <tr><td>17</td><td>C106</td><td>66.5℃</td><td>84.7℃</td></tr> <tr><td>18</td><td>LF100</td><td>63.6℃</td><td>82.1℃</td></tr> <tr><td>19</td><td>THS2</td><td>69.8℃</td><td>87.1℃</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 25.9 ℃	HIGH AMBIENT Ta=46.1 ℃	1	BD1	60.0℃	77.9℃	2	L1	43.6℃	62.0℃	3	RTH1	48.0℃	66.4℃	4	C8	75.6℃	93.0℃	5	C6	68.1℃	85.6℃	6	Q1	73.4℃	91.6℃	7	D1	91.1℃	109.5℃	8	U1	70.1℃	88.0℃	9	C16	72.6℃	90.6℃	10	T1	82.6℃	99.3℃	11	D100	90.3℃	107.2℃	12	Q100	83.5℃	102.2℃	13	U100	77.6℃	94.8℃	14	RG1	90.3℃	108.2℃	15	C206	71.0℃	89.9℃	16	C105	61.7℃	79.7℃	17	C106	66.5℃	84.7℃	18	LF100	63.6℃	82.1℃	19	THS2	69.8℃	87.1℃		
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 295VAC/100VAC O/P: FULL LOAD Ta= -25℃	TEST: OK																																																																																
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 ℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=40 ℃ HUMIDITY= 95% R.H	TEST: OK																																																																																
4	TEMPERATURE COEFFICIENT	±0.03%/℃ (0~45℃)	I/P: 230 VAC O/P: FULL LOAD	±0.0025%/℃ (0~45℃)																																																																																
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -45℃ ~ +90℃ 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: STATIC		TEST: OK																																																																																



25W PWM Output LED Driver

IDPV-25 series

6	THERMAL SHOCK TEST	1. Thermal shock Temperature: -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: 10 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: 180min in each axis (X.Y.Z) (6) Ta: 25°C	TEST: OK
8	CAPACITOR LIFE CYCLE	IDPV-25-12: SUPPOSE C105 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= 40 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 40 °C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta= 40 °C LIFE TIME	(1) 216281 HRS (2) 62136 HRS (3) 118532 HRS (4) 201428 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 382.7K hrs min MIL-HDBK-217F (25°C)	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	CHENZH/ZHUOKB	SKY	LIUWY