



# Test Report: IDPC-65-700

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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

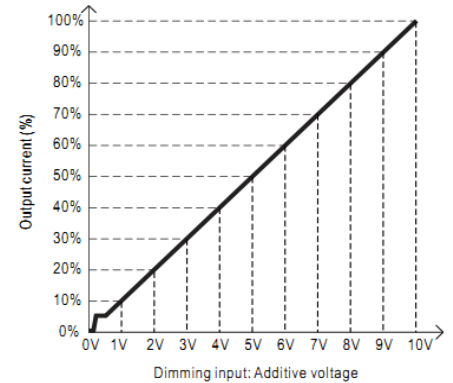
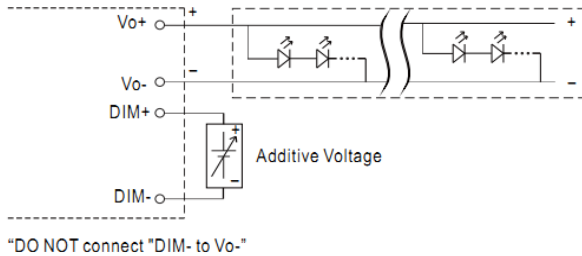
## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

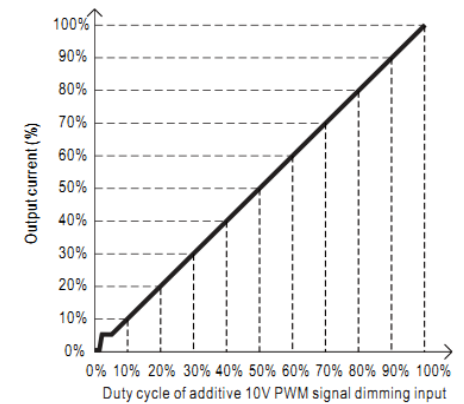
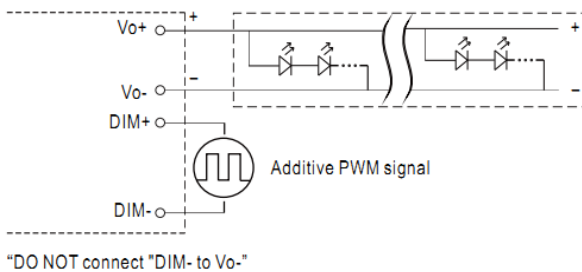
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONSTANT CURRENT REGION	69V~93V	I/P: 230VAC O/P: LED MODE Ta: 25°C	59 V~95 V
2	CURRENT RIPPLE	5% max@rated current	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	4.65%
3	CURRENT TOLERANCE	±7%	I/P: 230VAC O/P: FULL/MIN LOAD Ta: 25°C	±3.14%
4	OPEN CIRCUIT VOLTAGE (max)	118V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	113.6V
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	438 ms/230VAC
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> <p>Δ: 300 V @: 5.00 V Δ: 438ms @: -328ms</p> <p>Ch1 19.0 V Ch2 250 V 100ms A Ch1 74.5 V</p> <p>50.00 %</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	11.98 V

8 DIMMING TEST  
(For Blank -Type)

- 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	0.0800A	0.1490A	0.2135A	0.2800A	0.3460A	0.4145A	0.4817A	0.5452A	0.6123A	0.6785A
	%	0.00%	0.0800A	0.1490A	0.2135A	0.2800A	0.3460A	0.4145A	0.4817A	0.5452A	0.6123A	0.6785A
2	PWM(100Hz)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Output Current	0A	0.0900A	0.1540A	0.2160A	0.2800A	0.3470A	0.4150A	0.4820A	0.5440A	0.6100A	0.6758A
	%	0.00%	12.86%	22.00%	30.86%	40.00%	49.57%	59.29%	68.86%	77.71%	87.14%	96.54%

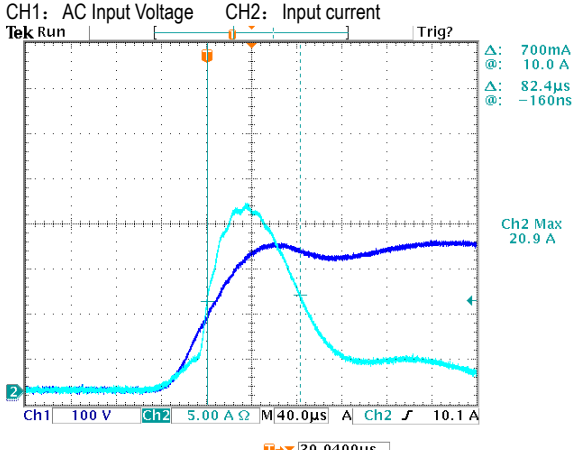
TEST RESULT: OK

9 DALI DIMMING OPERATION  
(primary side: for DA-Type)

- ※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.

I/P: 230 VAC  
O/P: DIMMING TEST  
Ta: 25°C  
TEST RESULT: OK

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~295VAC	I/P: TESTING O/P: 80%/FULL LOAD Ta: 25°C	177V~305V
			I/P: (1)LOW-LINE-3V=177 V HIGH-LINE+10V=305 V O/P: 80%/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 =0.321A/ 230VAC I =0.271A/ 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	0.388W for Blank-Type 0.595W for A-Type 0.459W 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 =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)	89%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	89.68%

	<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>86.8</td></tr> <tr><td>60%</td><td>86.5</td><td>87.2</td></tr> <tr><td>70%</td><td>87.2</td><td>87.8</td></tr> <tr><td>80%</td><td>87.8</td><td>88.5</td></tr> <tr><td>90%</td><td>88.8</td><td>89.5</td></tr> <tr><td>100%</td><td>89.5</td><td>90.0</td></tr> </tbody> </table>			LOAD	277V Efficiency (%)	230V Efficiency (%)	50%	86.0	86.8	60%	86.5	87.2	70%	87.2	87.8	80%	87.8	88.5	90%	88.8	89.5	100%	89.5	90.0
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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=0.984/ 230VAC PF=0.958/ 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>0.96</td></tr> <tr><td>80%</td><td>0.94</td><td>0.96</td></tr> <tr><td>90%</td><td>0.95</td><td>0.96</td></tr> <tr><td>100%</td><td>0.96</td><td>0.97</td></tr> </tbody> </table>			LOAD	277V PF	230V PF	50%	0.91	0.95	60%	0.92	0.96	70%	0.93	0.96	80%	0.94	0.96	90%	0.95	0.96	100%	0.96	0.97
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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=6.30% @75% load / 230VAC THD=8.92% @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: 80%/FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode, auto-recovery after fault condition is removed for DA type; Hiccup mode, re-power on to recovery for other type

**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) 692V (2) 614V (3) 680V
2	O/P Diode (MOSFET)	D100 Rated 10A/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) 560V (2) 568V (3) 504V
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) 15.4V (2) 14.8V (3) 15.3V
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) 530V (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: 1.824 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: IDPC-65-700 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 30.9℃ 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 41.1℃																																																										
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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 40 ℃ NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta=40 ℃ 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: Ta=-25℃~ +45℃ 2. Temperature change rate : 25℃ / 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	IDPC-65-700: 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= 40 °C LIFE TIME (3) I/P: 230VAC O/P: MIN LOAD Ta= 40 °C LIFE TIME	(1) 590178 HRS (2) 211557 HRS (3) 180872 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 380.7K hrs min MIL-HDBK-217F (25°C)	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	Carychen/ZHUOKB	SKY	LIUWY