Test Report: HLG-240H-C2100

250W Single Output LED Power Supply

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Component Stress Test

■ SAFETY & E.M.C. TEST

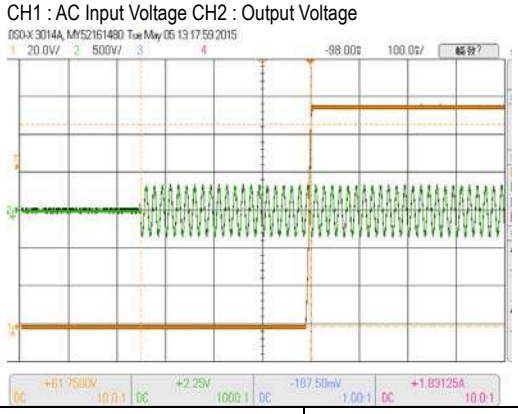
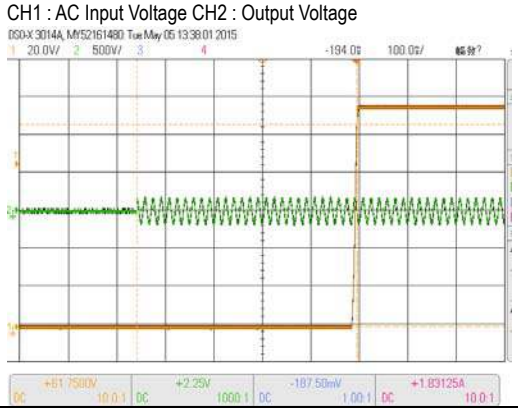
Safety Test
E.M.C. Test

■ RELIABILITY TEST

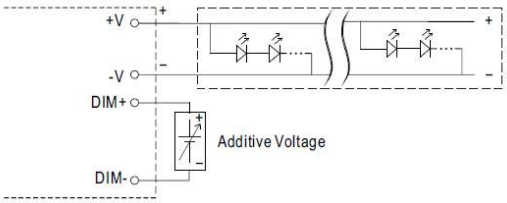
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

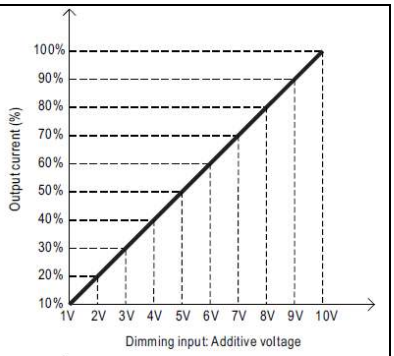
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT TOLERANCE	±5%	I/P: 230 VAC I/P:115VAC O/P:FULL LOAD Ta:25℃	2.0858A /230VAC@CV MAX-2V 2.0876A /230VAC@CV MIN 2.0854A/115VAC@CV MAX-2V 2.0869A/115VAC@CV MIN +0.695%
2	CONSTANT CURRENT REGION	CH1: 59V~ 119V	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	0V~118V /230VAC
3	OPEN CIRCUIT VOLTAGE (max.)	122V	I/P: 230 VAC O/P:NO LOAD Ta:25℃	119.5V
4	CURRENT ADJ. RANGE	CH1:1050mA~ 2100mA	I/P: 230 VAC I/P:115VAC O/P:CV MIN & CV MAX-2V Ta:25℃	806mA~ 2444mA /230VAC@CV MAX-2V 804mA~2434mA /230VAC@CV MIN 806mA~ 2445mA /115VAC@CV MAX-2V 805mA~ 2436mA/115VAC@CV MIN
5	CURRENT RIPPLE	5.0% max. @rated current	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	2.42%
6	SET UP TIME(Max)	230VAC/500 ms 115VAC/1000ms	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 352ms 115 VAC/ 456ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : AC Input Voltage CH2 : Output Voltage 		INPUT=115VAC/60HZ @ FULL LOAD CH1 : AC Input Voltage CH2 : Output Voltage 	
7	DIMMING OPERATION **(for B-Type)**	※**3 in 1 dimming function** ※Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 1 ~ 10VDC, or 10V PWM signal or resistance. ※Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers. ※Dimming source current from power supply: 100μ A (typ.)		

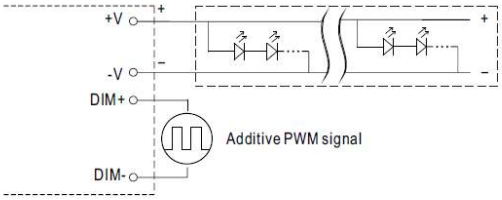
◎ Applying additive 1 ~ 10VDC



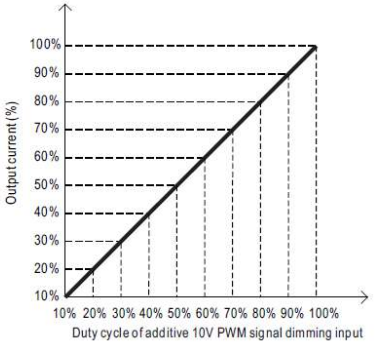
"DO NOT connect "DIM- to -V"



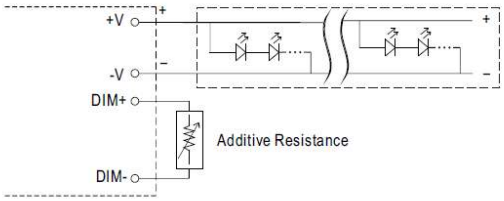
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



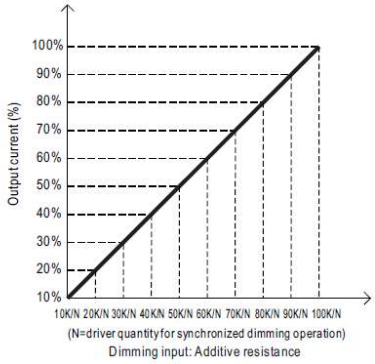
"DO NOT connect "DIM- to -V"



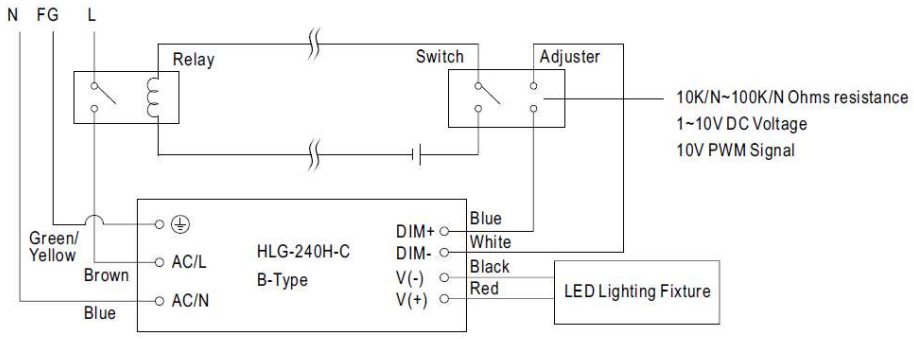
◎ Applying additive resistance:



"DO NOT connect "DIM- to -V"



Note: In the case of turning the lighting fixture down to 0% brightness, please refer to the configuration as follow, or please contact MEAN WELL for other options.



Using a switch and relay can turn ON/OFF the lighting fixture.

I/P：230VAC

O/P：DIMMING TEST

TA：25℃

R	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	OPEN
O/P CURRENT	0.223A	0.435A	0.644A	0.855A	1.064A	1.271A	1.482A	1.684A	1.880A	2.083A	2.125A
%	10.63%	20.70%	30.67%	40.71%	50.67%	60.52%	70.57%	80.19%	89.52%	99.19%	101.19%
V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN

		O/P CURRENT	0.226A	0.439A	0.660A	0.862A	1.078A	1.274A	1.478A	1.701A	1.908A	2.100A	2.125A
		%	10.76%	20.90%	31.43%	41.05%	51.33%	60.67%	70.38%	81.00%	90.86%	100.00%	101.19%
		PWM (100HZ)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
		O/P CURRENT	0.203A	0.424A	0.637A	0.852A	1.064A	1.273A	1.487A	1.695A	1.907A	2.117A	2.125A
		%	9.67%	20.19%	30.33%	40.57%	50.67%	60.62%	70.81%	80.71%	90.80%	100.81%	101.19%

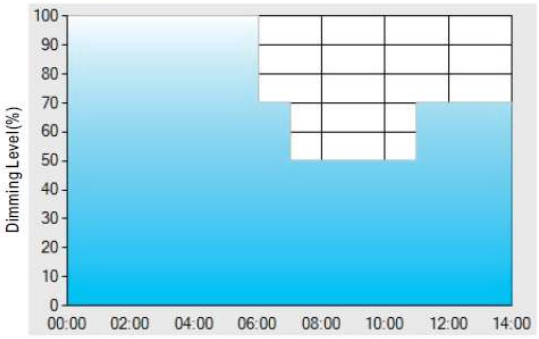
TEST RESULT：OK

8 DIMMING OPERATION **(for Dxx-Type by User definition)**

※Smart timer dimming function (for Dxx-Type by User definition)

MEAN WELL Smart timer dimming primarily provides the adaptive proportion dimming profile for the output constant current level to perform up to 14 consecutive hours. 3 dimming profiles hereunder are defined accounting for the most frequently seen applications. If other options may be needed,please contact MEAN WELL for details.

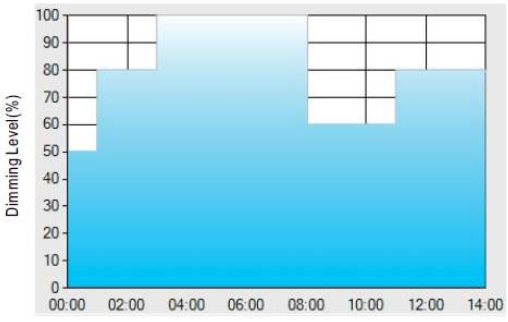
Ex：◎ D01-Type: the profile recommended for residential lighting



Set up for D01-Type in Smart timer dimming software program:

	T1	T2	T3	T4
TIME**	06:00	07:00	11:00	---
LEVEL**	100%	70%	50%	70%

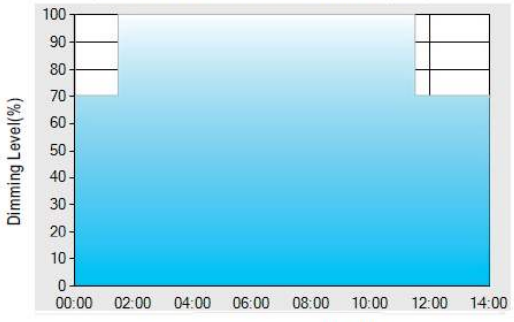
Ex: ◎ D02-Type: the profile recommended for street lighting



Set up for D02-Type in Smart timer dimming software program:

	T1	T2	T3	T4	T5
TIME**	01:00	03:00	8:00	11:00	---
LEVEL**	50%	80%	100%	60%	80%

Ex: ◎ D03-Type: the profile recommended for tunnel lighting

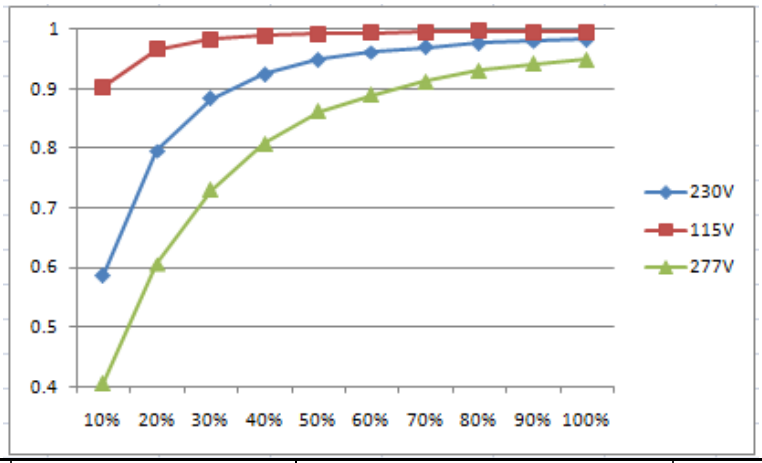
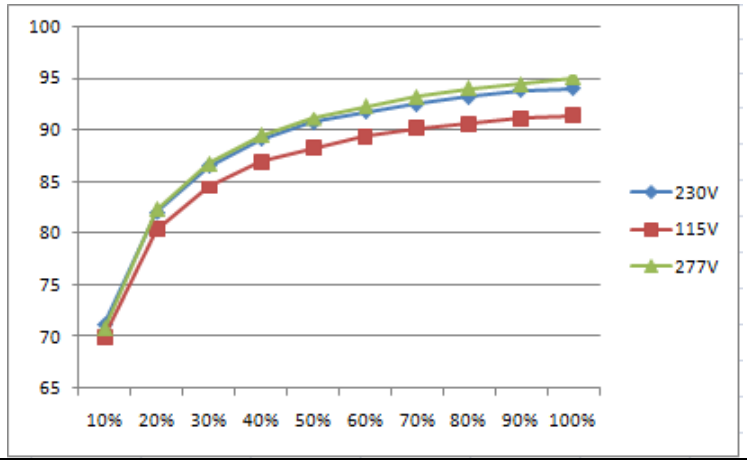


Set up for D03-Type in Smart timer dimming software program:

	T1	T2	T3
TIME**	01:30	11:00	---
LEVEL**	70%	100%	70%

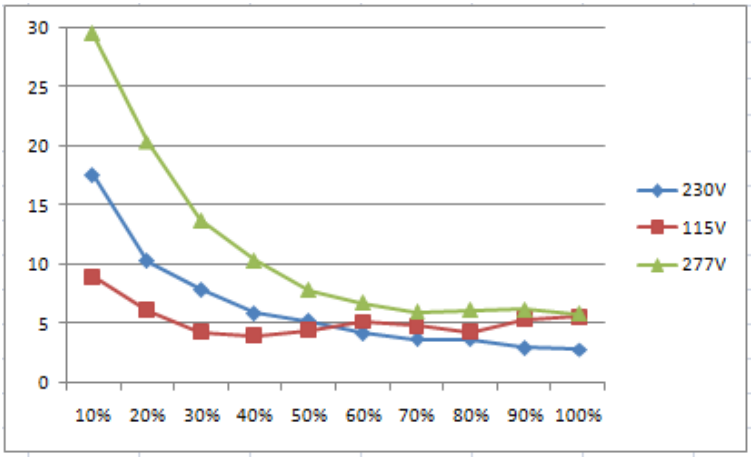
I/P：230VAC
O/P：DIMMING TEST
TA：25℃
TEST RESULT：OK

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~305 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	70V~305V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+10V=315 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec . OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE) (2) I/P:230Vac ON: 0.5 Sec . OFF: 0.5 Sec 20MIN	(1).TEST:OK (2).TEST :OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 100 VAC ~305VAC O/P:FULL~MIN LOAD Ta:25℃	OK
3	INPUT CURRENT (TYP)	277VAC/ 1.1 A 230 VAC/ 1.3 A 115 VAC/ 2.5 A	I/P: 277VAC/230 VAC/115 VAC O/P:FULL LOAD Ta:25℃	I= 0.987A/277VAC I = 1.17A/ 230VAC I =2.42A/ 115VAC
4	POWER FACTOR(TYP)	0.95/230 VAC FULL LOAD 0.98/115 VAC FULL LOAD 0.92/277 VAC FULL LOAD	I/P: 230 VAC/115VAC/277VAC O/P:FULL LOAD Ta:25℃	PF= 0.983/230V/100%LOAD PF=0.994/115V/100%LOAD PF= 0.944/277V/100%LOAD
	P.F vs LOAD 			
5	EFFICIENCY (TYP)	93.5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	94.22%
	EFFICIENCY vs LOAD 			

6	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 50% or higher at 230VAC / 115VAC Total harmonic distortion will be lower than 20% when output loading is 75% or higher at277VAC	I/P： 230VAC I/P： 115VAC O/P：50% LOAD Ta：25℃ I/P： 277VAC O/P：75% LOAD Ta：25℃	THD： 5.19 % THD： 4.34 % THD： 6.83 %

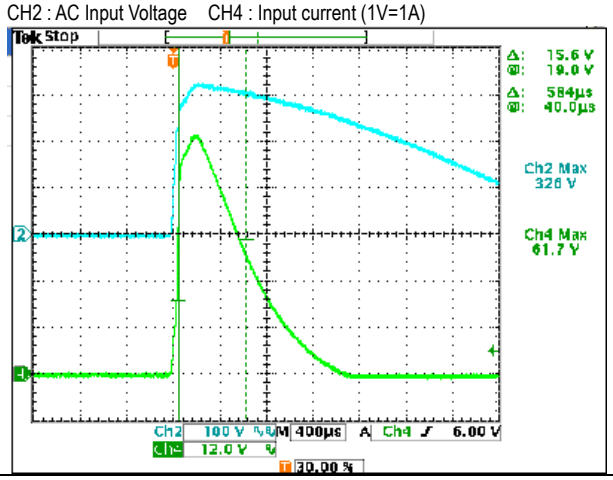
THD&LOAD



7	INRUSH CURRENT (TYP)	230 V/ 75A COLD START (twidth=700us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	I = 61.7A/ 230VAC T50= 584 us

INPUT=230VAC/50HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current (1V=1A)



ROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	V1: 125V~ 137V	I/P: 305VAC I/P: 230VAC I/P: 90VAC O/P:MIN LOAD Ta:25℃	130.59V/ 305VAC 130.64V/ 230VAC 130.73V/ 90VAC PROTECTION TYPE： Shut down and latch off o/p voltage, re-power on to recover

2	OVER TEMPERATURE PROTECTION	PROTECTION TYPE： Shut down o/p voltage, recovers automatically after temperature goes down	I/P: 305 VAC I/P: 90 VAC O/P:FULL LOAD	O.T.P. Active PROTECTION TYPE： Shut down o/p voltage, recovers automatically after temperature goes down
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC I/P: 90 VAC O/P: FULL LOAD Ta:25℃	NO DAMAGE PROTECTION TYPE： Constant current limiting, recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	P.F.C Transistor **(D to S) or (C to E)** Peak Voltage	Q1 Rated 600V/19A	I/P:High-Line +3V =308V AC ON/OFF VDS: O/P: (1)Full Load (2)Output Short (3)FULL LOAD CONTINUE I/P:Low-Line -3V = 107V AC ON/OFF VDS O/P: (1)Full Load (2)Output Short (3)FULL LOAD CONTINUE Ta:25℃	VDS: (1)514V (2)461V (3)518V VDS: (1)506V (2)498V (3)502V
2	PWM Transistor (D to S) or (C to E) **Peak Voltage**	Q3 Rated 20A/600V	I/P:High-Line +3V =308V AC ON/OFF VDS: O/P: (1)Full Load (2)Output Short (3)FULL LOAD CONTINUE I/P:Low-Line -3V = 107V AC ON/OFF VDS O/P: (1)Full Load (2)Output Short (3)FULL LOAD CONTINUE Ta:25℃	VDS: (1)510V (2)494V (3)470V VDS: (1)449V (2)478V (3)478V
3	Diode Peak **Voltage**	D102 Rated 20A/300V D103 Rated 20A/300V	I/P:High-Line +3V = 308 V AC ON/OFF VDS: O/P: (1)Full Load (2)Output Short (3)FULL LOAD CONTINUE VDS: (1)Full Load (2)Output Short (3)FULL LOAD CONTINUE Ta:25℃	D102: VDS: (1)277V (2)25.5V (3)276V D103: VDS: (1)286V (2)34.6V (3)275V

4	**Input Capacitor Voltage**	C5 Rated: 150u/450V SURGE POWER :495V	I/P:High-Line +3V =308 V O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Full Load /Min load Change Ta:25℃	(1)475V (2)459V (3) 446V
5	**Control IC Voltage Test**	PWM IC U70 Rated 8.85V~16V	I/P:High-Line +3V =308 V AC ON/OFF O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. (5)NO (LOW LINE) Ta:25℃	(1) 15.7V (2) 15.3V (3) 15.3V (4) 15.3V (5) 13.5V

■ SAFETY & EMC TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	IEC60950-1 I/P-O/P: 3.75KVAC/min I/P-FG: 2 KVAC/min<4.5mA O/P-FG:1.5KVAC/min	I/P-O/P: 4.125 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min Ta:25℃	I/P-O/P: 3.87mA I/P-FG: 3.83mA O/P-FG: 3.18mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25℃	I/P-O/P: 30GΩ I/P-FG: 22G Ω O/P-FG: 30G Ω NO DAMAGE
3	GROUNDING CONTINUITY	IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	30mΩ
4	LEAKAGE CURRENT	IEC60950-1 < 0.75mA / 277VAC	I/P: 277 VAC O/P:Min LOAD Ta:25℃	L-FG:0.32 mA N-FG:.0.32mA

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A CLASS C	I/P: 230VAC/50HZ O/P: FULL LOAD Ta:25℃	PASS
2	CONDUCTION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	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℃	CRITERIA A
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A

6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A
7	Test by certified Lab & Test Report Prepare. Any contradictions of the test results, please refer to the latest EMC test report.			

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL： HLG-240H-C1400 1. ROOM AMBIENT BURN-IN：3 HRS I/P： 230VAC O/P： FULL LOAD Ta= 29.2 ℃ 2. HIGH AMBIENT BURN-IN： 6 HRS I/P： 230VAC O/P： FULL LOAD Ta= 55.7 ℃		
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 305VAC/110VAC O/P： 100 % LOAD Ta= -40℃	TEST：OK
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60 ℃ NO DAMAGE	I/P： 305 VAC O/P：FULL LOAD Ta= 60 ℃ HUMIDITY= 95 %R.H	TEST：OK
4	TEMPERATURE COEFFICIENT	± 0.03 %/℃(0~60℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.022 %/℃(0~60℃)

NO	Position	ROOM AMBIENT	HIGH AMBIENT
1	BD1	71.7℃	94.1℃
2	C14	69.7℃	92.2℃
3	LF2	67.8℃	89.8℃
4	Q1	71.3℃	94.1℃
5	D3	713.0℃	93.9℃
6	L2	70.1℃	92.4℃
7	L1	71.9℃	94.1℃
8	D2	71.0℃	93.5℃
9	TSW1	68.6℃	90.9℃
10	Q3	70.1℃	92.4℃
11	C5	67.3℃	89.8℃
12	C35	70.0℃	92.6℃
13	C37	70.0℃	92.6℃
14	D102	72.2℃	94.4℃
15	T1	90.3℃	111.5℃
16	C201	70.9℃	93.2℃
17	C102	69.4℃	91.8℃
18	U1	69.3℃	91.6℃
19	U201	74.3℃	96.8℃

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	OK
6	THERMAL SHOCK TEST	1. Thermal shock Temperature： -45℃~ +65℃ 2. Temperature change rate ：25℃ / 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 turn on 58sec；turn off 2sec	OK
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：12min/sweep cycle (4) Acceleration：5G (5) Test Time：72min in each axis (X.Y.Z) (6) Ta：25℃	TEST：OK
8	CAPACITOR LIFE CYCLE	HLG-240H-C1400 :SUPPOSE C102 IS THE MOST CRITICAL COMPONENT (2) I/P： 230VAC O/P：FULL LOAD Tc= 75 ℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Tc= 75 ℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Tc= 75 ℃ LIFE TIME	(1) 129737 HRS (2) 93030 HRS (3) 97466 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 180K hrs min. MIL-HDBK-217F (25℃)	
10	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=50℃ Demonstration Mean Time Between Failure : 62,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT TSENG

12.10.30 A50-F031