



Test Report: HLG-80H-C700

90W 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	CONSTANT CURRENT REGION	A-TYPE:64V-129V B-TYPE:84V-129V	I/P : 230VAC O/P : CV MODE : A-TYPE:64V-128V B-TYPE:84V-128V Ta : 25°C	TEST : OK																																																																																																																
2	CURRENT TOLERANCE	± 5%	I/P : 230VAC O/P : CV MODE : 64V-128V Ta : 25°C	± 1.5%																																																																																																																
3	RIPPLE CURRENT	8%	I/P : 230VAC O/P : LED : 64V-128V Ta : 25°C	LED=64V 2.8 % LED=127V 3 %																																																																																																																
4	OUTPUT CURRENT ADJUST RANGE	CH1 : 420mA~ 700mA	I/P : 230VAC I/P : 115 VAC O/P : CV MODE : 127V Ta : 25°C	0.371 A- 0.786 A/ 230VAC 0.373 A- 0.789 A/ 115 VAC																																																																																																																
5	SET UP TIME	115 VAC : 500 ms (Max) 230VAC : 500 ms(Max)	I/P : 115 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	115 VAC/ 294 ms 230VAC/ 298 ms																																																																																																																
6	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5 %																																																																																																																
7	DIMMING TEST	<p>※Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 1 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.</p> <p>※ Please DO NOT connect "DIM-" to "-V".</p> <p>※Reference resistance value for output current adjustment (Typical)</p> <table border="1"> <thead> <tr> <th>Resistance value</th> <th>10K</th> <th>20K</th> <th>30K</th> <th>40K</th> <th>50K</th> <th>60K</th> <th>70K</th> <th>80K</th> <th>90K</th> <th>100K</th> </tr> </thead> <tbody> <tr> <td>Output current</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> </tbody> </table> <p>*1 ~ 10V dimming function for output current adjustment (Typical)</p> <table border="1"> <thead> <tr> <th>Dimming value</th> <th>1V</th> <th>2V</th> <th>3V</th> <th>4V</th> <th>5V</th> <th>6V</th> <th>7V</th> <th>8V</th> <th>9V</th> <th>10V</th> </tr> </thead> <tbody> <tr> <td>Output current</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> </tbody> </table> <p>*10V PWM signal for output current adjustment (Typical)</p> <table border="1"> <thead> <tr> <th>Duty value</th> <th>10%</th> <th>20%</th> <th>30%</th> <th>40%</th> <th>50%</th> <th>60%</th> <th>70%</th> <th>80%</th> <th>90%</th> <th>100%</th> </tr> </thead> <tbody> <tr> <td>Output current</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> </tbody> </table> <p>TEST RESULT: I/P : 230 VAC ; Ta : 25°C</p> <table border="1"> <tbody> <tr> <td rowspan="3">1</td> <td>Resistance value</td> <td>10K</td> <td>20K</td> <td>30K</td> <td>40K</td> <td>50K</td> <td>60K</td> <td>70K</td> <td>80K</td> <td>90K</td> <td>100K</td> </tr> <tr> <td>Output current</td> <td>0.083A</td> <td>0.151A</td> <td>0.219A</td> <td>0.287A</td> <td>0.359A</td> <td>0.428A</td> <td>0.448A</td> <td>0.556A</td> <td>0.633A</td> <td>0.702A</td> </tr> <tr> <td>%</td> <td>11.86%</td> <td>21.57%</td> <td>31.29%</td> <td>41.00%</td> <td>51.29%</td> <td>61.14%</td> <td>64.00%</td> <td>79.43%</td> <td>90.43%</td> <td>100.31%</td> </tr> <tr> <td>2</td> <td>Dimming value</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> </tbody> </table>			Resistance value	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Dimming value	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	1	Resistance value	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	Output current	0.083A	0.151A	0.219A	0.287A	0.359A	0.428A	0.448A	0.556A	0.633A	0.702A	%	11.86%	21.57%	31.29%	41.00%	51.29%	61.14%	64.00%	79.43%	90.43%	100.31%	2	Dimming value	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
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3	Output current	0.088A	0.154A	0.222A	0.290A	0.359A	0.428A	0.495A	0.564A	0.635A	0.708A
	%	12.57%	22.00%	31.71%	41.43%	51.29%	61.14%	70.71%	80.57%	90.71%	101.14%
	Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Output current	0.095A	0.162A	0.230A	0.298A	0.365A	0.435A	0.503A	0.572A	0.645A	0.710A
	%	13.57%	23.14%	32.86%	42.57%	52.14%	62.14%	71.86%	81.71%	92.14%	101.43%

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°C I/P : LOW-LINE-3V=87V HIGH-LINE+10V=315V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	75 V~305V TEST : OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P : 90VAC ~305 VAC O/P : FULL-MIN LOAD Ta : 25°C	TEST : OK
3	POWER FACTOR	0.98 / 115VAC(TYP) 0.96 / 230 VAC(TYP) 0.94 / 277 VAC(TYP)	I/P : 115VAC I/P : 230VAC I/P : 277VAC O/P : FULL LOAD Ta : 25°C	PF= 0.991 / 115VAC PF= 0.972 / 230VAC PF= 0.957 / 277VAC
4	EFFICIENCY	91.5 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	92.03 %
5	INPUT CURRENT	277V/ 0.38 A (TYP) 230V/ 0.45 A (TYP) 115V/ 0.88 A (TYP)	I/P : 277 VAC I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.369 A/ 277 VAC I = 0.434 A/ 230 VAC I = 0.868 A/ 115 VAC
6	INRUSH CURRENT	230V/ 60 A (TYP) ($t_{width}=410\mu s$ measured at 50% I_{peak}) COLD START	I/P : 115VAC O/P : FULL LOAD Ta : 25°C	I = 22.4 A/ 230VAC T50= 395 us
7	LEAKAGE CURRENT	< 0.75 mA/ 277 VAC	I/P : 277 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.2 mA N-FG : 0.2 mA
8	TOTAL HARMONIC DISTORTION	THD< 20% when output loading \geq 60% at 115VAC/230VAC input and output loading \geq 75% at 277VAC input	I/P : 115 VAC I/P : 230 VAC O/P : 60% LOAD I/P : 277 VAC O/P : 75%LOAD Ta : 25°C	THD : 11.36 /115VAC THD : 18.81 /230VAC THD : 19.15 /277VAC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	CH1 : 150 V ~ 170 V	I/P : 115 VAC I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	160.41 V/ 115VAC 160.83 V/ 230 VAC Shut down o/p voltage with auto-recovery or re-power on to recovery
2	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recovery
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 305 VAC 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	Power Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated : 10A/600V	I/P : High-Line +3V = 308V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 484 V (2) 452 V (3) 452 V
2	Diode Peak Voltage	D100 Rated : 3A/400V	I/P : High-Line +3V = 308 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 372 V (2) 212 V (3) 338 V
4	Input Capacitor Voltage	C5 Rated : 82u/450V	I/P : High-Line +3V = 308V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 449 V (2) 449 V (3) 438 V
5	Control IC Voltage Test	U1 Rated : 16V~38V	I/P : High-Line +3V = 308 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 22 V (2) 21.8 V (3) 21.8 V
6	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 9A/800V	I/P : High-Line +3V = 308V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 748 V (2) 460 V (3) 732 V

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P : 3.75 KVAC/min I/P-FG : 1.88 KVAC/<4.5mA O/P-FG : 1.5KVAC/min	I/P-O/P : 4 KVAC/min I/P-FG : 2.256 KVAC/min O/P-FG : 1.8 KVAC/min Ta : 25°C	I/P-O/P : 2.610 mA I/P-FG : 2.726 mA O/P-FG : 0.575 mA 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°C/70%RH	I/P-O/P : 14.9 GΩ I/P-FG : 18.3 GΩ O/P-FG : 30 GΩ NO DAMAGE
A3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	9 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A CLASS C	I/P: 230/347VAC/60HZ O/P:100%/60%ELECTRONIC LOAD O/P:100%/ LED LOAD Ta:25°C	PASS
2	CONDUCTION	EN55015 CLASS B	I/P: 230VAC (50HZ) O/P:FULL/100% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B	I/P: 230/230 VAC (50HZ) O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 INDUSTRY AIR:8KV / Contact:4KV	I/P:230/230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230/230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230/230 VAC/50HZ O/P:FULL LOAD Ta:25°C	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-80H-C350 1. ROOM AMBIENT BURN-IN : 2.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 31.9 °C 2. HIGH AMBIENT BURN-IN : 15 HRS I/P : 230VAC O/P : FULL LOAD Ta=50 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 31.9 °C</th> <th>HIGH AMBIENT Ta= 50 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF2</td><td>53.2°C</td><td>68.0°C</td></tr> <tr><td>2</td><td>BD1</td><td>53.8°C</td><td>68.5°C</td></tr> <tr><td>3</td><td>L1</td><td>54.1°C</td><td>68.9°C</td></tr> <tr><td>4</td><td>L3</td><td>55.3°C</td><td>69.6°C</td></tr> <tr><td>5</td><td>D6</td><td>56.6°C</td><td>71.1°C</td></tr> <tr><td>6</td><td>C5</td><td>55.7°C</td><td>70.0°C</td></tr> <tr><td>7</td><td>D12</td><td>62.0°C</td><td>76.9°C</td></tr> <tr><td>8</td><td>T1</td><td>62.0°C</td><td>76.0°C</td></tr> <tr><td>9</td><td>Q1</td><td>57.3°C</td><td>71.9°C</td></tr> <tr><td>10</td><td>Q2</td><td>55.3°C</td><td>69.9°C</td></tr> <tr><td>11</td><td>U1</td><td>55.8°C</td><td>69.9°C</td></tr> <tr><td>12</td><td>RTH2</td><td>55.1°C</td><td>69.0°C</td></tr> <tr><td>13</td><td>D100</td><td>58.2°C</td><td>72.5°C</td></tr> <tr><td>14</td><td>C106</td><td>57.3°C</td><td>71.5°C</td></tr> <tr><td>15</td><td>L100</td><td>51.3°C</td><td>66.3°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 31.9 °C	HIGH AMBIENT Ta= 50 °C	1	LF2	53.2°C	68.0°C	2	BD1	53.8°C	68.5°C	3	L1	54.1°C	68.9°C	4	L3	55.3°C	69.6°C	5	D6	56.6°C	71.1°C	6	C5	55.7°C	70.0°C	7	D12	62.0°C	76.9°C	8	T1	62.0°C	76.0°C	9	Q1	57.3°C	71.9°C	10	Q2	55.3°C	69.9°C	11	U1	55.8°C	69.9°C	12	RTH2	55.1°C	69.0°C	13	D100	58.2°C	72.5°C	14	C106	57.3°C	71.5°C	15	L100	51.3°C	66.3°C	
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 99% LOAD Ta : 25°C	TEST : OK																																																																
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/100VAC O/P : 100 % LOAD Ta= - -40°C	TEST : OK																																																																
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60°C NO DAMAGE	I/P : 305VAC O/P : FULL LOAD Ta= 60 °C HUMIDITY= 95 %R.H	TEST : OK																																																																
5	TEMPERATURE COEFFICIENT	± 0.03%(0-50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.004 %(0-50°C)																																																																
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		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°C		TEST : OK																																																																



8	CAPACITOR LIFE CYCLE	HVGC-80H-C350:SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD TC=70 °C LIFE TIME (2) I/P : 230VAC O/P : 75% LOAD TC=70 °C LIFE TIME (3) I/P : 230VAC O/P : 50% LOAD TC=70 °C LIFE TIME	(1) 84717HRS (2) 86029HRS (3) 93009HRS
9	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 309.7KHRS	
10	Ongoing Reliability Test	I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 62,000 hours	

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

2009/08/04 A50-F023