



Test Report: HLG-80H-C350

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

ESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																																	
1	CONSTANT CURRENT REGION	A-TYPE:128V-257V B-TYPE:167V-257V	I/P : 230VAC O/P : CV MODE : A-TYPE:128V-256V B-TYPE:167V-256V Ta : 25°C	TEST : OK																																																																																																																	
2	CURRENT ACCURACY	± 5%	I/P : 230VAC O/P : CV MODE : 128V-256V Ta : 25°C	± 1.1 %																																																																																																																	
3	RIPPLE CURRENT	5%	I/P : 230VAC O/P : LED : 128V-256V Ta : 25°C	LED=128V 4.46 % LED=254V 4.83 %																																																																																																																	
4	OUTPUT CURRENT ADJUST RANGE	CH1 : 210mA~ 350mA	I/P : 230VAC I/P : 115 VAC O/P : CV MODE : 254V Ta : 25°C	0.195 A~ 0.401 A / 230VAC 0.196 A~ 0.402 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 / 325 ms 230VAC / 331 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"> <thead> <tr> <th></th> <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 rowspan="2">1</td> <td>Output current</td> <td>0.039A</td> <td>0.074A</td> <td>0.108A</td> <td>0.142A</td> <td>0.186A</td> <td>0.212A</td> <td>0.245A</td> <td>0.278A</td> <td>0.317A</td> <td>0.351A</td> </tr> <tr> <td>%</td> <td>11.14%</td> <td>21.14%</td> <td>30.86%</td> <td>40.57%</td> <td>53.14%</td> <td>60.57%</td> <td>70.00%</td> <td>79.43%</td> <td>90.57%</td> <td>100.29%</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%		Resistance value	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K	1	Output current	0.039A	0.074A	0.108A	0.142A	0.186A	0.212A	0.245A	0.278A	0.317A	0.351A	%	11.14%	21.14%	30.86%	40.57%	53.14%	60.57%	70.00%	79.43%	90.57%	100.29%	2	Dimming value	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
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3	Output current	0.040A	0.074A	0.109A	0.144A	0.180A	0.212A	0.246A	0.281A	0.315A	0.351A
	%	11.43%	21.14%	31.14%	41.14%	51.43%	60.57%	70.29%	80.29%	90.00%	100.29%
	Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Output current	0.043A	0.077A	0.111A	0.146A	0.183A	0.215A	0.249A	0.284A	0.318A	0.353A
	%	12.29%	22.00%	31.71%	41.71%	52.29%	61.43%	71.14%	81.14%	90.86%	100.86%

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 ~ 305VAC 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= 0.990 / 115VAC PF= 0.968 / 230VAC PF= 0.949 / 277VAC
4	EFFICIENCY	91.5 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	92.41 %
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 = 0.368 A/ 277 VAC I = 0.435 A/ 230 VAC I = 0.869 A/ 115 VAC
6	INRUSH CURRENT	230V/ 60 A (TYP) (twidth=410us measured at 50% Ipeak) COLD START	I/P : 115VAC O/P : FULL LOAD Ta : 25°C	I = 27.6 A/ 230VAC T50= 398 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 ≥ 60% at 115VAC/230VAC input and output loading ≥ 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 : 11.4 /115VAC THD : 17.9 /230VAC THD : 19.4 /277VAC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	CH1 : 300 V ~340 V	I/P : 115 VAC I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	324V/ 115VAC 323V/ 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) 516 V (2) 442 V (3) 424 V
2	Diode Peak Voltage	D100 Rated : 3A/1KV	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) 740 V (2) 428 V (3) 684 V
3	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) 448 V (2) 449 V (3) 448 V
4	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) 22.4 V (2) 21.6 V (3) 22 V
5	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) 740 V (2) 460 V (3) 720 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 : 2 KVAC/min<4.5mA O/P-FG : 1.5 KVAC/min	I/P-O/P : 4 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 1.8KVAC/min Ta : 25°C	I/P-O/P : 2.820 mA I/P-FG : 2.573 mA O/P-FG : 0.519 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 : 4.87 GΩ I/P-FG : 4.85 GΩ O/P-FG : 19.8 GΩ NO DAMAGE
3	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/50% 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 : 305 VAC 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																																																																



90W Single Output LED Power Supply

HLG-80H-C series

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