



Test Report: HLG-120H-C1050

150W 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	74V~148V	I/P : 230VAC O/P : CV MODE : 74V~147V Ta : 25°C	TEST : OK
2	CURRENT TOLERANCE	± 5%	I/P : 230VAC O/P : CV MODE : 74V~147V Ta : 25°C	± 1.1 %
3	CURRENT RIPPLE	± 5%	I/P : 230VAC O/P : LED : 74V~147V Ta : 25°C	LED=74V 5.7 % LED=147V 2.9 %
4	OUTPUT CURRENT ADJUST RANGE	CH1 : 525mA~ 1050mA	I/P : 230VAC I/P : 115 VAC O/P : CV MODE : 146V Ta : 25°C	0.4697 A~ 1.1466 A/ 230VAC 0.4697 A~ 1.1467 A/ 115 VAC
5	SET UP TIME	115 VAC : 1000 ms (Max) 230VAC : 500 ms(Max)	I/P : 115 VAC I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	115 VAC/ 712 ms 230VAC/ 359 ms
6	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5 %

7	<p>DIMMING TEST ※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-. ※ Please DO NOT connect "DIM-" to "-V". ※Reference resistance value for output current adjustment (Typical)</p>																																																	
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3	Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
	Output current	0.145A	0.246A	0.347A	0.449A	0.551A	0.652A	0.753A	0.855A	0.957A	1.057A	1.091A
	Percentage of rated current	13.81%	23.44%	33.09%	42.73%	52.43%	62.10%	71.75%	81.41%	91.10%	100.70%	103.94%

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)	67.5 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) 0.93 /277 VAC(TYP)	I/P : 115VAC I/P : 230VAC I/P : 277VAC O/P : FULL LOAD Ta : 25°C	PF= 0.996 / 115VAC PF= 0.969 /230VAC PF= 0.945 /277VAC
4	EFFICIENCY	94 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	94.02 %
5	INPUT CURRENT	277V/ 0.7 A (TYP) 230V/ 0.8 A (TYP) 115V/ 1.6 A (TYP)	I/P : 277 VAC I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.63 A/ 277 VAC I = 0.73 A/ 230 VAC I = 1.44 A/ 115 VAC
6	INRUSH CURRENT	230V/ 50 A (TYP) (twidth=600us measured at 50% Ipeak) COLD START	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	I = 42 A/ 230VAC T50= 480 us
7	LEAKAGE CURRENT	< 0.75 mA / 277 VAC	I/P : 277 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.28 mA N-FG : 0.28 mA
8	TOTAL HARMONIC DISTORTION	THD< 20% when output loading \geq 50% at 115VAC/230VAC input and output loading \geq 75% at 277VAC input	I/P : 115 VAC I/P : 230 VAC O/P : 50% LOAD I/P : 277 VAC O/P : 75%LOAD Ta : 25°C	THD : 11.51 /115VAC THD : 18.16 /230VAC THD : 17.63 /277VAC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	CH1 : 165V ~ 175 V	I/P : 115 VAC I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	172.14 V/ 115VAC 172.28 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 , recovers automatically after temperature goes down
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 305 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Constant Current Limiting

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q5 Rated 11A/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) 458 V (3) 460 V
2	Diode Peak Voltage	D103 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) 330 V (2) 16 V (3) 320 V
3	Input Capacitor Voltage	C5 Rated: 100u/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) 452 V (2) 460 V (3) 464 V
4	Control IC Voltage Test	U 900 Rated 8.85V~16V	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) 14.1 V (2) 13.8 V (3) 13.8 V
5	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 20A/600V	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) 572 V (2) 466 V (3) 504 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 : 1.8 KVAC/min Ta : 25°C	I/P-O/P : 3.46 mA I/P-FG : 2.792 mA O/P-FG : 2.007 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 : 30 GΩ I/P-FG : 22.2 GΩ O/P-FG : 30 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	19 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 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 B
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230/230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA B
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 B
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-120H-C1050 1. ROOM AMBIENT BURN-IN : 4 HRS I/P : 230VAC O/P : FULL LOAD Ta= 34.8 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 59.2°C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=34.8°C</th> <th>HIGH AMBIENT Ta= 59.2°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>58.5°C</td><td>81.9°C</td></tr> <tr><td>2</td><td>L1</td><td>56.4°C</td><td>80.2°C</td></tr> <tr><td>3</td><td>D3</td><td>60.9°C</td><td>84.1°C</td></tr> <tr><td>4</td><td>Q1</td><td>57.0°C</td><td>81.0°C</td></tr> <tr><td>5</td><td>C5</td><td>62.4°C</td><td>85.9°C</td></tr> <tr><td>6</td><td>D2</td><td>59.6°C</td><td>83.7°C</td></tr> <tr><td>7</td><td>Q5</td><td>57.6°C</td><td>81.9°C</td></tr> <tr><td>8</td><td>RTH2</td><td>63.4°C</td><td>88.3°C</td></tr> <tr><td>9</td><td>T1</td><td>59.6°C</td><td>83.6°C</td></tr> <tr><td>10</td><td>LF100</td><td>54.4°C</td><td>78.6°C</td></tr> <tr><td>11</td><td>C110</td><td>55.9°C</td><td>80.2°C</td></tr> <tr><td>12</td><td>U1</td><td>57.0°C</td><td>81.2°C</td></tr> <tr><td>13</td><td>U900</td><td>57.0°C</td><td>81.3°C</td></tr> <tr><td>14</td><td>L2</td><td>59.3°C</td><td>83.3°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=34.8°C	HIGH AMBIENT Ta= 59.2°C	1	BD1	58.5°C	81.9°C	2	L1	56.4°C	80.2°C	3	D3	60.9°C	84.1°C	4	Q1	57.0°C	81.0°C	5	C5	62.4°C	85.9°C	6	D2	59.6°C	83.7°C	7	Q5	57.6°C	81.9°C	8	RTH2	63.4°C	88.3°C	9	T1	59.6°C	83.6°C	10	LF100	54.4°C	78.6°C	11	C110	55.9°C	80.2°C	12	U1	57.0°C	81.2°C	13	U900	57.0°C	81.3°C	14	L2	59.3°C	83.3°C	
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/100VAC O/P : 100 % LOAD Ta= -25°C	TEST : OK																																																												
3	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																																																												
4	TEMPERATURE COEFFICIENT	± 0.03%(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.0026 %(0~50°C)																																																												
5	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																																																												
6.	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30°C~ +65°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 turn on 58sec ; turn off 2sec		OK																																																												
8	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																																																												



9	CAPACITOR LIFE CYCLE	HLG-120H-C1050:SUPPOSE C110 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD TC=80 °C LIFE TIME (2) I/P : 230VAC O/P : 75% LOAD TC =80 °C LIFE TIME (3) I/P : 230VAC O/P : 50% LOAD TC= 80 °C LIFE TIME	(1) 69040HRS (2) 74159HRS (3) 75328HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 652.2K hrs min. Telcordia SR-332 (Bellcore) ; 191.1K hrs min. MIL-HDBK-217F (25°C)	
11	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

12.10.30 A50-F031