



Test Report: HLG-80H-36

80W Constant Voltage + Constant Current LED Driver

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control 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	21.6V~36V	I/P : 230VAC O/P : CV=21.6V~35V Ta : 25°C	TEST : OK
2	RIPPLE & NOISE	V1 : 200 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 36.2 mVp-p (Max)
3	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 33V ~ 40 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	31.749 V ~ 40.671 V/ 230 VAC 31.753 V ~ 40.673 V/ 115 VAC
4	CURRENT ADJUST RANGE	CH1 : 1.38 A ~ 2.3 A	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	0.545 A~ 2.522 A/ 230 VAC 0.565 A ~ 2.530 A/ 115 VAC
5	OUTPUT VOLTAGE TOLERANCE	V1 : 1 %~-1 % (Max)	I/P : 100 VAC / 305 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 0.13 %~-0.13 %
6	LINE REGULATION	V1 : 0.5 %~-0.5 % (Max)	I/P : 100VAC ~ 305 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 %~-0 %
7	LOAD REGULATION	V1 : 0.5%~-0.5 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 0.07 %~-0.07 %
8	SET UP TIME	230VAC : 500 ms (Max) 115VAC : 1200 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 294 ms 115VAC/ 330 ms
9	RISE TIME	230VAC : 200 ms (Max) 115VAC : 200 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 30 ms 115VAC/ 25 ms
10	HOLD UP TIME	230VAC : 16 ms (TYP) 115VAC : 16 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 80 ms 115VAC/ 34 ms
11	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5 %
12	DYNAMIC LOAD	V1 : 3600 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1)392 mVp-p (2)392 mVp-p

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DIMMER TEST
(for B-type only)

SPEC:

*Reference resistance value for output current adjustment (Typical)

Resistance value	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K
Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

*1 ~ 10V dimming function for output current adjustment (Typical)

Dimming value	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

*10V PWM signal for output current adjustment (Typical)

Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Output current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

TEST RESULT: I/P : 230 VAC ;Ta : 25℃

1	Resistance value	10K	20K	30K	40K	50K	60K	70K	80K	90K	100K
	Output current	0.285A	0.484A	0.723A	0.957A	1.207A	1.420A	1.641A	1.867A	2.115A	2.339A
	%	12.39%	21.04%	31.43%	41.61%	52.48%	61.74%	71.35%	81.17%	91.96%	101.70%
2	Dimming value	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
	Output current	0.280A	0.501A	0.709A	0.936A	1.167A	1.397A	1.624A	1.855A	2.082A	2.309A
	%	12.17%	21.78%	30.83%	40.70%	50.74%	60.74%	70.61%	80.65%	90.52%	100.39%
3	Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Output current	0.230A	0.463A	0.680A	0.919A	1.159A	1.398A	1.638A	1.878A	2.119A	2.357A
	%	10.00%	20.13%	29.57%	39.96%	50.39%	60.78%	71.22%	81.65%	92.13%	102.48%

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℃ I/P : LOW-LINE=3V= 87 V HIGH-LINE=305 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	70 V~305V TEST : OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P : 90 VAC ~ 305 VAC O/P : FULL~MIN LOAD Ta : 25℃	TEST : OK
3	POWER FACTOR	0.96 / 230 VAC(TYP) 0.96 / 115 VAC(TYP) 0.94 / 277 VAC(TYP)	I/P : 230 VAC I/P : 115 VAC I/P : 277 VAC O/P : FULL LOAD Ta : 25℃	PF= 0.964 / 230 VAC PF= 0.991 / 115 VAC PF= 0.945 / 277 VAC
4	EFFICIENCY	91 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25℃	91.49 %

5	INPUT CURRENT	277V/ 0.4 A (TYP) 230V/ 0.425 A (TYP) 115V/ 0.85 A (TYP)	I/P : 277 VAC I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.35 A/ 277 VAC I = 0.40 A/ 230 VAC I = 0.79 A/ 115 VAC
6	INRUSH CURRENT	230V/ 70 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 63 A/ 230 VAC
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 : 8.65 /115VAC THD : 14.25 /230VAC THD : 14.16 /277VAC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	95 % ~ 108 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	101 %/ 230 VAC 101%/ 115 VAC Constant current limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	CH1 : 41 V ~ 49 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	44.432 V/ 230 VAC 44.152 V/ 115 VAC Shut down o/p voltage, re-power on to recover
3	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 recover
4	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, 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	Q 1 Rated : 12A/700V	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)	616	V
				(2)	476	V
				(3)	612	V
2	Diode Peak Voltage	Q101 Rated : 20A/170V	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)	169	V
				(2)	133	V
				(3)	168	V
3	Clamp Diode Peak Voltage	D12 Rated : 2A/800V	I/P : High-Line +3V = 308 V O/P : (1) Dynamic Load 90%Duty/1KHz (2)Full load continue Ta : 25°C	(1)	576	V
				(2)	578	V
4	Input Capacitor Voltage	C 5 Rated : 82u/450V	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)	418.73	V
				(2)	431.02	V
				(3)	431.05	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)	21.462	V
				(2)	21.416	V
				(3)	21.409	V
6	Power Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated : 10A/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)	478	V
				(2)	448	V
				(3)	438	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 : 2.4KVAC/min O/P-FG : 1.8 KVAC/min Ta : 25°C	I/P-O/P : 2.44 mA I/P-FG : 2.10 mA O/P-FG : 044 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 : 30 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	9 mΩ
4	APPROVAL	TUV : Certificate NO : R50202516 UL : File NO : E334687		

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230VAC/50HZ O/P:100% ELECTRONICLOAD O/P:100%LED LOAD Ta:25°C	PASS
2	CONDUCTION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B	I/P: 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 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA B
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 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 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-80H-24 1. ROOM AMBIENT BURN-IN : 13.5 HRS I/P : 230VAC O/P : 95% LOAD Ta=25.1 °C °C 2. HIGH AMBIENT BURN-IN : 67 HRS I/P : 230VAC O/P : 95% LOAD Ta= 63.8 °C °C <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=25.1 °C</th><th>HIGH AMBIENT Ta= 63.8°C</th></tr><tr><td>1</td><td>LF1</td><td>46.1°C</td><td>78.3°C</td></tr><tr><td>2</td><td>BD1</td><td>51.3°C</td><td>83.2°C</td></tr><tr><td>3</td><td>L1</td><td>50.3°C</td><td>81.6°C</td></tr><tr><td>4</td><td>C5</td><td>50.1°C</td><td>81.2°C</td></tr><tr><td>5</td><td>Q1</td><td>54.2°C</td><td>86.2°C</td></tr><tr><td>6</td><td>Q2</td><td>52.5°C</td><td>84.1°C</td></tr><tr><td>7</td><td>U1</td><td>48.1°C</td><td>79.7°C</td></tr><tr><td>8</td><td>RTH2</td><td>48.5°C</td><td>79.9°C</td></tr><tr><td>9</td><td>T1</td><td>55.7°C</td><td>86.7°C</td></tr><tr><td>10</td><td>Q101</td><td>52.0°C</td><td>83.8°C</td></tr><tr><td>11</td><td>C106</td><td>50.0°C</td><td>81.8°C</td></tr><tr><td>12</td><td>L100</td><td>47.9°C</td><td>79.9°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta=25.1 °C	HIGH AMBIENT Ta= 63.8°C	1	LF1	46.1°C	78.3°C	2	BD1	51.3°C	83.2°C	3	L1	50.3°C	81.6°C	4	C5	50.1°C	81.2°C	5	Q1	54.2°C	86.2°C	6	Q2	52.5°C	84.1°C	7	U1	48.1°C	79.7°C	8	RTH2	48.5°C	79.9°C	9	T1	55.7°C	86.7°C	10	Q101	52.0°C	83.8°C	11	C106	50.0°C	81.8°C	12	L100	47.9°C	79.9°C
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10	Q101	52.0°C	83.8°C																																																					
11	C106	50.0°C	81.8°C																																																					
12	L100	47.9°C	79.9°C																																																					
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/100VAC O/P : 95 % LOAD Ta= -40°C/-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 : 95% LOAD Ta= 60 °C HUMIDITY= 95 %R.H	TEST : OK																																																				
4	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P : 230 VAC O/P : 95% LOAD	± 0.02 %(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 : -40°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																																																				

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 : 60min in each axis (X.Y.Z) (6) Ta : 25℃	TEST : OK
8	CAPACITOR LIFE CYCLE	HLG-80H-24 :SUPPOSE C106 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Tc=75 ℃ LIFE TIME (2) I/P : 230VAC O/P : 75% LOAD Tc= 75 ℃ LIFE TIME (3) I/P : 230VAC O/P : 50% LOAD Tc= 75 ℃ LIFE TIME	(1) 75240 HRS (2) 83721 HRS (3) 94640 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 357.8K 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

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