



Test Report: HLG-185H-24

185W Single Output Switching Power Supply

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Other Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

■ RELIABILITY TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 29.4 mVp-p (Max)
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 22V~27 V	I/P: 230 VAC I/P:115VAC O/P:MIN LOAD Ta:25°C	21.40 V~27.57 V /230VAC 21.45 V~27.57 V/115VAC
3	CURRENT ADJ RANGE	3.9A~7.8A	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	3.13 A~ 8.81 A
4	CONSTANT CURRENT REGION	12V~24V	I/P: 230 VAC O/P:CV MODE Ta:25°C	O/P=12V: 8.32 A O/P=23V: 8.31 A
5	OUTPUT VOLTAGE TOLERANCE	V1: -1 % ~ 1 % (Max)	I/P: 100 VAC /305VAC O/P:FULL/ 0 % LOAD Ta:25°C	V1: -0.18 %~ 0.18 %
6	LINE REGULATION	V1: - 0.5% ~ 0.5 % (Max)	I/P:100 VAC ~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: -0.18 %~ 0.18 %
8	SET UP TIME	230VAC/ 500 ms (Max) 115VAC/ 1000 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 342 ms 115 VAC/ 706 ms
9	RISE TIME	230VAC/ 80 ms (Max) 115VAC/ 80 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 7 ms 115 VAC/ 7 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/ 21 ms 115 VAC/ 21 ms
11	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST:< 5 %
12	DYNAMIC LOAD	V1: 2400 mVp-p	I/P: 230 VAC O/P:(1)FULL /Min LOAD 90%DUTY/1KHZ (2)FULL /Min LOAD 90%DUTY/120HZ Ta:25°C	712 mVp-p 1300 mVp-p

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DIMMER TEST
(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	0.822A	1.660A	2.416A	3.167A	3.920A	4.664A	5.412A	6.162A	6.915A	7.669A
	%	10.54%	21.28%	30.97%	40.60%	50.26%	59.79%	69.38%	79.00%	88.65%	98.32%
2	Dimming value	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
	Output current	0.926A	1.688A	2.442A	3.212A	3.979A	4.750A	5.514A	6.286A	7.052A	7.811A
	%	11.87%	21.64%	31.31%	41.18%	51.01%	60.90%	70.69%	80.59%	90.41%	100.14%
3	Duty value	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	Output current	0.894A	1.665A	2.432A	3.197A	3.962A	4.928A	5.493A	6.260A	7.027A	7.719A
	%	11.46%	21.35%	31.18%	40.99%	50.79%	63.18%	70.42%	80.26%	90.09%	98.96%

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	71 V~305V
			I/P: (1)LOW-LINE-3V=87 V (2)HIGH-LINE=305 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 100 VAC ~305VAC O/P:FULL~MIN LOAD Ta:25°C	OK
3	POWER FACTOR	0.95/ 230 VAC FULL LOAD (TYP) 0.98/ 115 VAC FULL LOAD (TYP) 0.92/ 277 VAC FULL LOAD (TYP)	I/P: 230 VAC I/P: 115 VAC I/P: 277 VAC O/P:FULL LOAD Ta:25°C	PF=0.968 /230V/100%LOAD PF= 0.998 /115V/100%LOAD PF= 0.935/277V/100%LOAD
4	EFFICIENCY	93.5% (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	93.83 %
5	INPUT CURRENT	277V/ 0.8 A 230 V/ 0.9 A 115 V/ 2.1 A	I/P: 277 VAC I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 0.75 A/ 277VAC I = 0.89 A/ 230VAC I = 1.76 A/ 115VAC
6	INRUSH CURRENT	230 V/ 65A (Typ) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 59 A/ 230VAC
7	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 : 8.99 /115VAC THD : 16.37 /230VAC THD : 115.22 /277VAC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	95 %~108 %	I/P: 305VAC I/P: 230 VAC I/P: 100 VAC O/P:TESTING Ta:25°C	106 %/305VAC 106 %/ 230VAC 106 %//100VAC Constant current limiting, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	V1: 28V~ 34V	I/P: 305VAC I/P: 230 VAC I/P: 90 VAC O/P:MIN LOAD Ta:25°C	29.90 V/ 305VAC 30.25 V/ 230VAC 30.29 V/ 100VAC Shut down o/p voltage with auto recovery or re-power on to recovery

3	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
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC 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	Q5 Rated 12A/500V	I/P : High-Line +3V = 308V O/P : (1) Full Load Turn on (2) Output Short (3) Full load continue Ta : 25°C	(1) 478 V (2) 450 V (3) 456 V
2	Diode Peak Voltage	Q101 Rated 80A/75V	I/P : High-Line +3V = 308V O/P : (1) Full Load Turn on (2) Output Short (3) Full load continue Ta : 25°C	(1) 62.4 V (2) 13.6 V (3) 58.8 V
		Q102 Rated 80A/75V	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) 62.4 V (2) 28.6 V (3) 58.4 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) 437 V (2) 437.3 V (3) 437.2 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) 12.709 V (2) 12.637 V (3) 12.632 V
5	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 17A/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) 486 V (2) 454 V (3) 460 V

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:2KVAC/min<4.5mA O/P-FG:1.5KVAC/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: 2.617 mA I/P-FG: 2.315 mA O/P-FG: 3.36 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	I/P-O/P: 30 GΩ I/P-FG: 30 GΩ O/P-FG: 30 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	9 mΩ
4	LEAKAGE CURRENT	IEC60950-1 < 0.75 mA / 240VAC	I/P: 240 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.22 mA N-FG: 0.22 mA
5	APPROVAL	TUV: Certificate NO : E334940 UL: File NO : R50185176		

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS C	I/P: 230VAC/50HZ LOAD:LED/ELECTRONIC LOAD O/P:100% LOAD Ta:25°C	PASS
2	CONDUCTION	EN55022 EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	EN55022 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 A
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 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 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-185H-24			
		1. ROOM AMBIENT BURN-IN : 15.5 HRS			
		I/P : 230VAC O/P : FULL LOAD Ta= 29 ℃			
		2. HIGH AMBIENT BURN-IN : 7 HRS			
		I/P : 230VAC O/P : FULL LOAD Ta= 61.1 ℃			

7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35°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-185H-24:SUPPOSE C102 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Tc= 75 °C LIFE TIME (2) I/P : 230VAC O/P : 75% LOAD Tc= 75 °C LIFE TIME (3) I/P : 230VAC O/P : 50% LOAD Tc= 75 °C LIFE TIME	(1) 69856 HRS (2) 83288 HRS (3) 91859 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 192.2K hrs min. MIL-HDBK-217F (25°C)	OK
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

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