



Test Report: HLG-100H-24

100W 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: 26.4 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 | 21.19 V-27.88 V /230VAC 21.19 V-27.88 V /115VAC |
| 3 | CURRENT ADJ RANGE | 2.5A-4A | I/P: 230 VAC O/P: FULL LOAD Ta: 25°C | 1.69 A-4.52 A |
| 4 | CONSTANT CURRENT REGION | 12V-24V | I/P: 230 VAC O/P: CV MODE Ta: 25°C | O/P=12V: 5.190 A O/P=23V: 5.188 A |
| 5 | OUTPUT VOLTAGE TOLERANCE | V1: -1% ~ 1% (Max) | I/P: 100 VAC /305VAC O/P: FULL / 0% LOAD Ta: 25°C | V1: -0.2% ~ 0.2% |
| 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: -0.2% ~ 0.2% |
| 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/ 394 ms 115 VAC/ 824 ms |
| 9 | RISE TIME | 230VAC/ 50 ms (Max) 115VAC/ 50 ms (Max) | I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C | 230VAC/ 9.4 ms 115 VAC/ 9.3 ms |
| 10 | HOLD UP TIME | 230VAC/ 16 ms (Typ) 115VAC/ 16ms (Typ) | I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C | 230VAC/ 23 ms 115 VAC/ 23 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 | 556 mVp-p 968 mVp-p |

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|----|------------------------------|---|------------------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|
| 13 | 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°C | | | | | | | | | | | |
| | | 1 | Resistance value | 10K | 20K | 30K | 40K | 50K | 60K | 70K | 80K | 90K | 100K |
| | | | Output current | 0.448A | 0.832A | 1.227A | 1.624A | 2.030A | 2.422A | 2.802A | 3.181A | 3.593A | 3.975A |
| % | 11.20% | | 20.80% | 30.68% | 40.60% | 50.75% | 60.55% | 70.05% | 79.53% | 89.83% | 99.38% | | |
| 2 | Dimming value | 1V | 2V | 3V | 4V | 5V | 6V | 7V | 8V | 9V | 10V | | |
| | Output current | 0.451A | 0.848A | 1.244A | 1.632A | 2.023A | 2.419A | 2.804A | 3.193A | 3.586A | 3.974A | | |
| | % | 11.28% | 21.20% | 31.10% | 40.80% | 50.58% | 60.48% | 70.10% | 79.83% | 89.65% | 99.35% | | |
| 3 | Duty value | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | | |
| | Output current | 0.497A | 0.890A | 1.283A | 1.675A | 2.067A | 2.456A | 2.847A | 3.238A | 3.630A | 4.018A | | |
| | % | 12.43% | 22.25% | 32.08% | 41.88% | 51.68% | 61.40% | 71.18% | 80.95% | 90.75% | 100.45% | | |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT |
|----|---------------------------|--|---|---|
| 1 | INPUT VOLTAGE RANGE | 90VAC~305 VAC | I/P:TESTING O/P:FULL LOAD Ta:25°C | 78 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) 0.93/ 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=0.96/230V/100%LOAD PF=0.997/115V/100%LOAD PF=0.941/277V/100%LOAD |
| 4 | EFFICIENCY | 93 (TYP) | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | 93.76 % |
| 5 | INPUT CURRENT | 277V /0.5 A 230 V/ 0.55 A 115 V/ 1.2 A | I/P: 277 VAC I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | I = 0.42 A/ 277VAC I = 0.47 A/ 230VAC I = 0.95 A/ 115VAC |
| 6 | INRUSH CURRENT | 230 V/ 60A (Typ) COLD START | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | I = 50 A/ 230VAC |
| 7 | 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 : 10.43 /115VAC THD : 16.44 /230VAC THD : 17.74 /277VAC |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT |
|----|-------------------------|--------------|---|---|
| 1 | OVER LOAD PROTECTION | 95 %-106 % | I/P: 305VAC I/P: 230 VAC I/P: 100 VAC O/P:TESTING Ta:25°C | 102 %/305VAC 102 %/ 230VAC 102 %/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 | 29.57 V/ 305VAC 29.56 V/ 230VAC 29.55 V/ 100VAC Shut down o/p voltage with auto recovery or re-power on to recovery |



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| 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) 472 V (2) 452 V (3) 454 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) 61.2 V (2) 16.4 V (3) 58.4 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) 57.2 V (2) 29.1 V (3) 56.4 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) 436.4 V (2) 437.5 V (3) 436.9 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) 13.893 V (2) 12.95 V (3) 12.89 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) 494 V (2) 456 V (3) 454 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:2 KVAC/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:1.8KVAC/min Ta:25°C | I/P-O/P: 2.592 mA I/P-FG: 2.348 mA O/P-FG: 3.65 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 | 11 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. | | | |



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| 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-100H-24 :SUPPOSE C102 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) 64999 HRS (2) 65043 HRS (3) 65043 HRS |
| 10 | MTBF | M Conducted by Parts Stress Analysis Prediction 192.2 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 |

2003/12/12 A50-F023