



Test Report: PLM-40-1400B

40W Single Output AC Dimmable 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

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------------|--|--|--|---------|
| 1 | RIPPLE & NOISE | V1 : 3000 mVp-p (Max) | I/P : 230VAC O/P : FULL LOAD Ta : 25°C | V1 : 1500 mVp-p (Max) | P |
| 2 | OPERATING VOLTAGE RANGE | V1= 15V-29V | I/P : 230VAC I/P : 115VAC O/P : CV MODE Ta : 25°C | O/P= 15V : 1.414 A 230V O/P= 28V : 1.407 A 230V O/P= 15V : 1.419 A 115V O/P= 28V : 1.413 A 115V | P |
| 3 | SET UP TIME | 230VAC : 500 ms (Max) 115VAC : 500 ms (Max) | I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C | 230VAC/ 199 ms 115VAC/ 204 ms | P |
| 4 | OVER/UNDERSHOOT TEST | < 34V | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | TEST : < 34 V | P |
| 5 | CURRENT ACCURACY | ±5% | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | TEST : ±1.04 % | P |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---------------------------|--|---|--|---------|
| 1 | INPUT VOLTAGE RANGE | 110VAC~295 VAC | I/P : TESTING O/P : FULL LOAD Ta : 25°C | 105 V~295V | P |
| | | | I/P : LOW-LINE-3V=107 V HIGH-LINE=295 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 OSC | I/P : 110 VAC ~ 295 VAC O/P : FULL-MIN LOAD Ta : 25°C | TEST : OK | P |
| 3 | POWER FACTOR | 0.97 / 115 VAC(TYP) 0.95 / 230 VAC(TYP) 0.90 / 277 VAC(TYP) | I/P : 115 VAC I/P : 230 VAC I/P : 277 VAC O/P : FULL LOAD Ta : 25°C | PF= 0.994 / 100% PF= 0.963 / 100% PF= 0.928 / 100% | P |
| 4 | EFFICIENCY | 86 % (TYP) | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | 86.84 % | P |
| 5 | INPUT CURRENT | 115V/ 0.50 A (TYP) 230V/ 0.30 A (TYP) 277V/ 0.25 A (TYP) | I/P : 115 VAC I/P : 230 VAC I/P : 277 VAC O/P : FULL LOAD Ta : 25°C | I = 0.400 A/ 115 VAC I = 0.201 A/ 230 VAC I = 0.173 A/ 277 VAC | P |
| 6 | INRUSH CURRENT | 230V/ 15 A (TYP) (twidth=75us measured at 50% Ipeak) COLD START | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | I = 5.08 A/ 230 VAC T = 27.6 us | P |
| 7 | LEAKAGE CURRENT | < 0.5 mA / 240 VAC | I/P : 240 VAC O/P : Min LOAD Ta : 25°C | L-CASE : 0.003 mA N-CASE : 0.003 mA | P |
| 8 | TOTAL HARMONIC DISTORTION | Total harmonic distortion will be lower than 20% when output loading is 60% or higher at 115VAC / 230VAC | I/P : 115VAC I/P : 230VAC O/P : 60% LOAD Ta : 25°C | THD : 6.54 % THD : 10.79 % | P |
| | | Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 277VAC | I/P : 277VAC O/P : 75% LOAD Ta : 25°C | THD : 13.64 % | |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------------|--|---|--|---------|
| 1 | OVER TEMPERATURE PROTECTION | SPEC : TSW1 : 115± 5 °C O.T.P. NO DAMAGE | I/P : 230 VAC O/P : FULL LOAD | O.T.P. Active Hiccup mode, recovers automatically after temperature goes down | P |
| 2 | SHORT PROTECTION | SHORT EVERY OUTPUT 1 HOUR NO DAMAGE | I/P : 295 VAC O/P : FULL LOAD Ta : 25°C | NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed. | P |

COMPONENT STRESS TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|--|---------------------------------------|--|--|---------|
| 1 | Power Transistor (D to S) or (C to E) Peak Voltage | Q 1 Rated : HFS10N80: 800V/9.4A | I/P : High-Line +3V = 298 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C | (1) 666 V (2) 530 V (3) 654 V | P |
| 2 | Diode Peak Voltage | D100 Rated : FCH20A15: 150 V/ 20 A | I/P : High-Line +3V = 298 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C | (1) 100 V (2) 104 V (3) 99.6 V | P |
| 3 | Clamp Diode Peak Voltage | D 1 Rated : RL206G: 800V/2A | I/P : High-Line +3V = 298 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C | (1) 604 V (2) 477 V (3) 590 V | P |
| 4 | Control IC Voltage Test | U 1 Rated : OZ8027: 25 V | I/P : High-Line +3V = 298 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) 16.7 V (2) 19.8 V (3) 16.5 V | P |

■ SAFETY & E.M.C. TEST

SAFETY TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|----------------------|-------------------------|--------------------------------------|---------------------------------|---------|
| 1 | WITHSTAND VOLTAGE | I/P-O/P : 3.75 KVAC/min | I/P-O/P : 4 KVAC/min Ta : 25°C | I/P-O/P : 0.805 mA NO DAMAGE | P |
| 2 | ISOLATION RESISTANCE | I/P-O/P : 500VDC>100MΩ | I/P-O/P : 500 VDC Ta : 25°C/70%RH | I/P-O/P : >9999 MΩ NO DAMAGE | P |

E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|--|--|-------------------------------|---------|
| 1 | HARMONIC | EN61000-3-2 CLASS C | I/P: 230/240/277VAC /50HZ/60HZ O/P:100% LOAD Ta:25°C | PASS | P |
| 2 | CONDUCTION | EN55015 | I/P:230 VAC (50HZ) O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab | P |
| 3 | RADIATION | EN55015 | I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab | P |
| 4 | E.S.D | EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | P |
| 5 | E.F.T | EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | P |
| 6 | SURGE | EN61000-4-5 INDUSTRY L-N :2KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA B | P |
| 7 | Test by certified Lab & Test Report Prepare | | | | |

■ RELIABILITY TEST

ENVIRONMENT TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|--|--|---|---------------------|---------|
| 1 | TEMPERATURE RISE TEST | MODEL : PLM-40-1050B 1. ROOM AMBIENT BURN-IN : 2.5 HRS I/P : 230VAC O/P : 95% LOAD Ta=32.0 °C 2. HIGH AMBIENT BURN-IN : 3.5 HRS I/P : 230VAC O/P : 95% LOAD Ta=45.8 °C | | | P |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 2 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P : 110VAC/295VAC O/P : 95 % LOAD Ta= -30 °C | TEST : OK | P |
| 3 | HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST | AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE | I/P : 295 VAC O/P : 95% LOAD Ta= 45 °C HUMIDITY= 95 %R.H | TEST : OK | P |
| 4 | TEMPERATURE COEFFICIENT | ± 0.03 % (0-50°C) | I/P : 230 VAC O/P : 95% LOAD | ± 0.0115 % (0-50°C) | P |
| 5 | STORAGE TEMPERATURE TEST | 1. Thermal shock Temperature : -45°C~ +85°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 | P |
| 6 | THERMAL SHOCK TEST | 1. Thermal shock Temperature : -35°C~ +50°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/Fu11 Load AC ON/OFF TEST turn on 58sec ; turn off 2sec | | OK | P |



| | | | | |
|----|-----------------------------|--|--|---|
| 7 | VIBRATION TEST | 1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10-500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 72min in each axis (X.Y.Z) (6) Ta : 25°C | TEST : OK | P |
| 8 | CAPACITOR LIFE CYCLE | PLM-40-1050B:SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta=25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=45 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=45 °C LIFE TIME | (1) 144573.4 HRS (2) 42079.9 HRS (3) 45444.3 HRS | P |
| 9 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 822.70KHRS | | P |
| 10 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure(Expected Life) : 20,000 hours @ Tcase 75°C; 50,000 hours @ Tcase 60°C | | P |

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|------------|----------------|-------------|--------|----------|
| 2013/07/10 | PRODUCT SAMPLE | PASS | ZOULF | HOWAY |

2009/08/04 A50-G058