



Test Report: PLM-12-350

12W Single Output 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 : 3600 mVp-p (Max) | I/P : 230VAC O/P : FULL LOAD Ta : 25°C | V1 : 1750 mVp-p (Max) | PASS |
| 2 | LED OPERATING VOLTAGE RANGE | V1= 22 V ~ 36 V | I/P : 230VAC I/P : 115VAC O/P : CV MODE Ta : 25°C | O/P= 22V : 0.358 A 230V O/P= 35V : 0.357 A 230V O/P= 22V : 0.353 A 115V O/P= 35V : 0.354 A 115V | PASS |
| 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/ 226 ms 115VAC/ 296 ms | PASS |
| 4 | OVER/UNDERSHOOT TEST | < 42V | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | TEST : <42 V | PASS |
| 5 | CURRENT ACCURACY | ±5% | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | TEST : ±2.23 % | PASS |

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 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) | 107 V ~ 295 V TEST : OK | PASS |
| 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 | PASS |
| 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= 0.968 / 100% PF= 0.949 / 100% | PASS |
| 4 | EFFICIENCY | 85 % (TYP) | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | 87.08 % | PASS |
| 5 | INPUT CURRENT | 115V/ 0.15 A (TYP) 230V/ 0.08 A (TYP) 277V/ 0.07 A (TYP) | I/P : 115 VAC I/P : 230 VAC I/P : 277 VAC O/P : FULL LOAD Ta : 25°C | I = 0.128 A/ 115 VAC I = 0.067 A/ 230 VAC I = 0.057 A/ 277 VAC | PASS |

| | | | | | |
|---|---------------------------|--|---|--|------|
| 6 | INRUSH CURRENT | 230V/ 15 A (TYP) (twidh=50us measured at 50% Ipeak) COLD START | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | I = 1.32 A / 230 VAC T = 44.8 us | PASS |
| 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 | PASS |
| 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 : 9.86 % THD : 15.14 % | PASS |
| | | 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 : 14.52 % | |
| 9 | NO LOAD CONSUMPTION | < 0.5 W | I/P:115VAC I/P:230VAC I/P:277VAC O/P:NO LOAD | < 0.19 W < 0.34 W < 0.41 W | PASS |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|------------------|--|---|--|---------|
| 1 | 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. | PASS |

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 : 700 V / 10 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) 662 V (2) 530 V (3) 604 V | PASS |
| 2 | Diode Peak Voltage | D100 Rated : :400 V / 3 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) 298 V (2) 306 V (3) 172 V | PASS |
| 3 | Clamp Diode Peak Voltage | D 2 Rated : 1000 V / 1 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) 634 V (2) 512 V (3) 604 V | PASS |
| 4 | Control IC Voltage Test | U 1 Rated : 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) 17.8 V (2) 19.0 V (3) 19.0 V | PASS |

■ 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 : 1.085 mA NO DAMAGE | PASS |
| 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 | PASS |

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 | PASS |
| 2 | CONDUCTION | EN55015 | I/P:230 VAC (50HZ) O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab | PASS |
| 3 | RADIATION | EN55015 | I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab | PASS |
| 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 | PASS |
| 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 | PASS |
| 6 | SURGE | EN61000-4-5 INDUSTRY L-N :2KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | PASS |
| 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-12-700 1. ROOM AMBIENT BURN-IN : 1.0 HRS I/P : 230VAC O/P : CVmode=17V Ta=26.7 °C 2. HIGH AMBIENT BURN-IN : 2.0 HRS I/P : 230VAC O/P : CVmode=17V Ta=49.6 °C | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 26.7 °C</th> <th>HIGH AMBIENT Ta= 49.6 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>38.9°C</td><td>59.8°C</td></tr> <tr><td>2</td><td>BD1</td><td>48.6°C</td><td>69.0°C</td></tr> <tr><td>3</td><td>L1</td><td>47.0°C</td><td>67.5°C</td></tr> <tr><td>4</td><td>Q1</td><td>48.4°C</td><td>78.6°C</td></tr> <tr><td>5</td><td>T1</td><td>58.2°C</td><td>78.2°C</td></tr> <tr><td>6</td><td>D101</td><td>70.1°C</td><td>87.8°C</td></tr> <tr><td>7</td><td>C25</td><td>55.4°C</td><td>74.8°C</td></tr> <tr><td>8</td><td>D100</td><td>66.7°C</td><td>84.6°C</td></tr> <tr><td>9</td><td>C105</td><td>57.8°C</td><td>76.6°C</td></tr> </tbody> </table> | NO | Position | ROOM AMBIENT Ta= 26.7 °C | HIGH AMBIENT Ta= 49.6 °C | 1 | LF1 | 38.9°C | 59.8°C | 2 | BD1 | 48.6°C | 69.0°C | 3 | L1 | 47.0°C | 67.5°C | 4 | Q1 | 48.4°C | 78.6°C | 5 | T1 | 58.2°C | 78.2°C | 6 | D101 | 70.1°C | 87.8°C | 7 | C25 | 55.4°C | 74.8°C | 8 | D100 | 66.7°C | 84.6°C | 9 | C105 | 57.8°C | 76.6°C | | PASS |
| NO | Position | ROOM AMBIENT Ta= 26.7 °C | HIGH AMBIENT Ta= 49.6 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | LF1 | 38.9°C | 59.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | BD1 | 48.6°C | 69.0°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | L1 | 47.0°C | 67.5°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Q1 | 48.4°C | 78.6°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | T1 | 58.2°C | 78.2°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | D101 | 70.1°C | 87.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | C25 | 55.4°C | 74.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | D100 | 66.7°C | 84.6°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | C105 | 57.8°C | 76.6°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P : 295VAC/110VAC O/P : LED LOAD=17V Ta= -35°C | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | TEMPERATURE COEFFICIENT | + 0.03 % (0-50°C) | I/P : 230 VAC O/P : CVmode=17V | ± 0.003 % (0-50°C) | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 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 | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | THERMAL SHOCK TEST | 1. Thermal shock Temperature : -35°C ~ +55°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/ CVmode=17V AC ON/OFF TEST turn on 58sec ; turn off 2sec | | OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | VIBRATION TEST | 1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10-500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 3G (5) Test Time : 90min in each axis (X.Y.Z) (6) Ta : 25°C | | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | CAPACITOR LIFE CYCLE | PLM-12-700: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) 363805.5 HRS (2) 120859.5 HRS (3) 122577.3 HRS | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 808.162KHRS | | | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure(Expected Life) : 20,000 hours @ Tcase 60°C ; 50,000 hours @ Tcase 45°C | | | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| SAMPLE | TEST RESULT | TESTER | APPROVAL |
|----------------|-------------|--------------|----------|
| PRODUCT SAMPLE | PASS | ZHUOKB/ZOULF | LIUWY |

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