



# Test Report: PLD-40-1050B

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40W 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 : 2600 mVp-p (Max) | I/P : 230VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | V1 : 1500 mVp-p (Max)                    | P       |
| 2  | OPERATING VOLTAGE RANGE | V1= 22V-38V           | I/P : 230VAC<br>O/P : CV MODE<br>Ta : 25°C    | O/P= 22V : 1.051 A<br>O/P= 37V : 1.052 A | P       |
| 3  | SET UP TIME             | 230VAC : 500 ms (Max) | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | 230VAC/ 443 ms                           | P       |
| 4  | OVER/UNDERSHOOT TEST    | < 50V                 | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | TEST : < 50 V                            | P       |
| 5  | CURRENT ACCURACY        | ±5%                   | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | TEST : ±0.12% %                          | P       |

## INPUT FUNCTION TEST

| NO | TEST ITEM                 | SPECIFICATION   | TEST CONDITION  | RESULT                                 | VERDICT |
|----|---------------------------|---|---|--|---------|
| 1  | INPUT VOLTAGE RANGE       | 180VAC~295 VAC  | I/P : TESTING<br>O/P : FULL LOAD<br>Ta : 25°C   | 175 V~295V                             | P       |
|    |                           |   | I/P :<br>LOW-LINE-3V=177 V<br>HIGH-LINE=295 V<br>O/P : FULL/MIN LOAD<br>ON : 30 Sec . OFF : 30 Sec 10MIN<br>( AC POWER ON/OFF NO DAMAGE ) | TEST : OK                              |         |
| 2  | INPUT FREQUENCY RANGE     | 47HZ ~63 HZ<br>NO DAMAGE OSC  | I/P : 180 VAC ~ 295 VAC<br>O/P : FULL -MIN LOAD<br>Ta : 25°C  | TEST : OK                              | P       |
| 3  | POWER FACTOR              | 0.9 / 230 VAC(TYP)  | I/P : 230 VAC   | PF= 0.967 / 100%                       | P       |
|    |                           | 0.9 / 277 VAC(TYP)  | I/P : 277 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | PF= 0.942 / 100%                       |         |
| 4  | EFFICIENCY                | 87 % (TYP)  | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | 88.63 %                                | P       |
| 5  | INPUT CURRENT             | 230V/ 0.35 A (TYP)  | I/P : 230 VAC   | I = 0.198 A/ 230 VAC                   | P       |
|    |                           | 277V/ 0.30 A (TYP)  | I/P : 277 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | I = 0.171 A/ 277 VAC                   |         |
| 6  | INRUSH CURRENT            | 230V/ 25 A (TYP)<br>(width=60us measured at 50% Ipeak)<br>COLD START                            | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | I = 21.359 A/ 230 VAC<br>T = 51.6 us   | P       |
| 7  | LEAKAGE CURRENT           | < 0.5 mA / 240 VAC  | I/P : 240 VAC<br>O/P : Min LOAD<br>Ta : 25°C  | L-CASE : 0.003 mA<br>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 230VAC | I/P : 230VAC<br>O/P : 60% LOAD<br>Ta : 25°C   | THD : 15.51 %                          | P       |
|    |                           | Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 277VAC | I/P : 277VAC<br>O/P : 75% LOAD<br>Ta : 25°C   | THD : 15.20 %                          |         |

**PROTECTION FUNCTION TEST**

| NO | TEST ITEM                   | SPECIFICATION                                  | TEST CONDITION                                | RESULT   | VERDICT |
|----|-----------------------------|--|---|--|---------|
| 1  | OVER TEMPERATURE PROTECTION | SPEC :<br>TSW1 : 105± 5 °C O.T.P.<br>NO DAMAGE | I/P : 230 VAC<br>O/P : FULL LOAD              | O.T.P. Active<br>Shut down o/p voltage, re-power on to recover                     | P       |
| 2  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE         | I/P : 295 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | NO DAMAGE<br>Hiccup mode, recovers automatically after fault condition is removed. | P       |

**COMPONENT STRESS TEST**

| NO | TEST ITEM  | SPECIFICATION                        | TEST CONDITION  | RESULT                                 | VERDICT |
|----|--|--------------------------------------|---|--|---------|
| 1  | Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q 2 Rated :<br>STP10NK80ZFP: 800V/9A | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C                       | (1) 604 V<br>(2) 498 V<br>(3) 588 V    | P       |
| 2  | Diode Peak Voltage                                     | D100 Rated :<br>STTH2003CT: 300V/20A | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br>Ta : 25°C                        | (1) 202 V<br>(2) 272 V<br>(3) 198 V    | P       |
| 3  | Clamp Diode Peak Voltage                               | D 10 Rated :<br>HER308: 1000V/3A     | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br>Ta : 25°C                        | (1) 620 V<br>(2) 478 V<br>(3) 576 V    | P       |
| 4  | Control IC Voltage Test                                | U 1 Rated :<br>NCP1608B: 10.2V~20V   | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load Change<br>Ta : 25°C | (1) 14.2 V<br>(2) 12.0 V<br>(3) 14.2 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<br>Ta : 25°C    | I/P-O/P : 1.288 mA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P : 500VDC>100MΩ  | I/P-O/P : 500 VDC<br>Ta : 25°C/70%RH | I/P-O/P : >9999 MΩ<br>NO DAMAGE | P       |

**E.M.C TEST**

| NO | TEST ITEM                                   | SPECIFICATION  | TEST CONDITION   | RESULT                        | VERDICT |
|----|---|--|--|-------------------------------|---------|
| 1  | HARMONIC                                    | EN61000-3-2<br>CLASS C                                 | I/P: 230/240/277VAC /50HZ/60HZ<br>O/P:100% LOAD<br>Ta:25°C | PASS                          | P       |
| 2  | CONDUCTION                                  | EN55015  | I/P:230 VAC (50HZ)<br>O/P:FULL LOAD<br>Ta:25°C             | PASS<br>Test by certified Lab | P       |
| 3  | RADIATION                                   | EN55015  | I/P: 230 VAC (50HZ)<br>O/P:FULL LOAD<br>Ta:25°C            | PASS<br>Test by certified Lab | P       |
| 4  | E.S.D                                       | EN61000-4-2<br>LIGHT INDUSTRY<br>AIR:8KV / Contact:4KV | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C              | CRITERIA A                    | P       |
| 5  | E.F.T                                       | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT: 1KV            | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C              | CRITERIA B                    | P       |
| 6  | SURGE                                       | EN61000-4-5<br>LIGHT INDUSTRY<br>L-N :1KV              | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>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 : PLD-40-1750B<br>1. ROOM AMBIENT BURN-IN : 2.5 HRS<br>I/P : 230VAC O/P : 95% LOAD Ta=30.3 °C<br>2. HIGH AMBIENT BURN-IN : 3.5 HRS<br>I/P : 230VAC O/P : 95% LOAD Ta=56.5 °C   |   |                    | P       |
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| 2  | LOW TEMPERATURE TURN ON TEST                                      | TURN ON AFTER 2 HOUR   | I/P : 180VAC/295VAC<br>O/P : 95 % LOAD<br>Ta= -30 °C              | TEST : OK          | P       |
| 3  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 50 °C<br>NO DAMAGE  | I/P : 295 VAC<br>O/P : 95% LOAD<br>Ta= 50 °C<br>HUMIDITY= 95 %R.H | TEST : OK          | P       |
| 4  | TEMPERATURE COEFFICIENT   | ± 0.03 % (0-50°C)  | I/P : 230 VAC<br>O/P : 95% LOAD                                   | ± 0.015 % (0-50°C) | P       |
| 5  | STORAGE TEMPERATURE TEST  | 1. Thermal shock Temperature : -45°C~ +85°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 5 CYCLE<br>5. Input/Output condition : STATIC  |   | OK                 | P       |
| 6  | THERMAL SHOCK TEST  | 1. Thermal shock Temperature : -35°C~ +55°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition : 230VAC/Fu11 Load AC ON/OFF TEST<br>turn on 58sec ; turn off 2sec |   | OK                 | P       |



|    |                             |  |  |   |
|----|-----------------------------|--|--|---|
| 7  | VIBRATION TEST              | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10-500Hz<br>(3) Sweep Time : 12min/sweep cycle<br>(4) Acceleration : 2G<br>(5) Test Time : 72min in each axis (X.Y.Z)<br>(6) Ta : 25°C                       | TEST : OK  | P |
| 8  | CAPACITOR LIFE CYCLE        | PLD-40-1750B:SUPPOSE C105 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta=25 °C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta=50 °C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta=50 °C LIFE TIME | (1) 431801.6HRS<br>(2) 59462.4HRS<br>(3) 100684.8HRS | P |
| 9  | MTBF                        | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE : 865.176KHRS   |  | P |
| 10 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure(Expected Life) :<br>30,000 hours @ Tcase 75°C; 50,000 hours @ Tcase 65°C   |  | P |

| TEST RESULT | TESTER | APPROVAL |
|-------------|--------|----------|
| PASS        | ZOULF  | HOWAY    |

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