



Test Report: CEN-75-24

75W Single Output LED 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: 2.7 Vp-p (Max) | I/P: 230 VAC O/P: FULL LOAD Ta: 25°C | V1: 1.71 Vp-p (Max) |
| 2 | OUTPUT VOLTAGE ADJUST RANGE | CH1: 22 V ~ 27 V | I/P: 230 VAC I/P: 115VAC O/P: MIN LOAD Ta: 25°C | 20.96V ~ 27.93 V / 230VAC 20.95V ~ 27.91 V / 115VAC |
| 3 | CURRENT ADJ RANGE | 2.36 A ~ 3.15A | I/P: 230 VAC O/P: CV=Vo-2V Ta: 25°C | 1.628 A ~ 3.444 A |
| 4 | CONSTANT CURRENT REGION | 18V ~ 24V | I/P: 230 VAC O/P: CV MODE Ta: 25°C | O/P=18 V: 3.329 A O/P=23 V: 3.315 A |
| 5 | OUTPUT VOLTAGE TOLERANCE | V1: 10% ~ -10% (Max) | I/P: 100 VAC / 295VAC O/P: FULL / 0% LOAD Ta: 25°C | V1: 1.5% ~ -1.5% |
| 6 | LINE REGULATION | V1: 3% ~ -3% (Max) | I/P: 100 VAC ~ 295 VAC O/P: FULL LOAD Ta: 25°C | V1: 0.42% ~ -0.42% |
| 7 | LOAD REGULATION | V1: 5% ~ -5% (Max) | I/P: 230 VAC O/P: FULL ~ MIN LOAD Ta: 25°C | V1: 1.5% ~ -1.5% |
| 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/ 360 ms 115 VAC/ 628 ms |
| 9 | OVER/UNDERSHOOT TEST | < ±10% | I/P: 230 VAC O/P: FULL LOAD Ta: 25°C | TEST: < 10% |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|-----------------------|--|---|--|
| 1 | INPUT VOLTAGE RANGE | 90VAC~295 VAC | I/P:TESTING O/P:FULL LOAD Ta:25°C | 51V~264V |
| | | | 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 ~295AC O/P:FULL~MIN LOAD Ta:25°C | OK |
| 3 | POWER FACTOR | 0.95/ 230 VAC FULL LOAD 0.97/ 115 VAC FULL LOAD 0.9/ 277 VAC FULL LOAD | 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=0.991 /115V/100%LOAD PF=0.91 /277V/100%LOAD |
| 4 | EFFICIENCY | 89% (TYP) | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | 90.83% |
| 5 | INPUT CURRENT | 230 V/ 0.55 A (Typ) 115 V/ 1.1 A (Typ) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | I = 0.37 A/ 230VAC I = 0.73 A/ 115VAC |
| 6 | INRUSH CURRENT | 230 V/ 45 A (Typ) COLD START | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | I = 36 A/ 230VAC |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|-----------------------------|--|---|---|
| 1 | OVER LOAD PROTECTION | 95 %~110 % | I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C | 105 %/ 230VAC 105 %//115VAC Constant current limiting, |
| 2 | OVER VOLTAGE PROTECTION | V1: 28 V~ 34V | I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C | 30.9 V/ 230VAC 30.2 V/ 115VAC Shunt down Re- power ON |
| 3 | OVER TEMPERATURE PROTECTION | NO DAMAGE | I/P: 230 VAC O/P:FULL LOAD | O.T.P. Active Shut down o/p voltage · re-power on to recover |
| 4 | SHORT PROTECTION | SHORT EVERY OUTPUT 1 HOUR NO DAMAGE | I/P: 295VAC O/P: FULL LOAD Ta:25°C | NO DAMAGE Hiccup Mode |

COMPONENT STRESS TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|--|------------------------|--|--|
| 1 | Power Transistor (D to S) or (C to E) Peak Voltage | Q1 Rated 13A/600V | 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) 552 V (2) 496 V (3) 548 V |
| 2 | Diode Peak Voltage | D100 Rated 20A/200V | 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) 135 V (2) 111 V (3) 134 V |
| 3 | Control IC Voltage Test | U 1 Rated 10.5V~21V | 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) 15.18 V (2) 15.07V (3) 15.07 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:1.5 KVAC/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: 5.05 mA I/P-FG: 3.82 mA O/P-FG: 3.98 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: 11.5 GΩ I/P-FG: 6.66 GΩ O/P-FG: 11.3 GΩ NO DAMAGE |
| 3 | GROUNDING CONTINUITY | IEC60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ | 40A / 2min Ta:25°C | 35 mΩ |
| 4 | LEAKAGE CURRENT | IEC60950-1 < 0.75 mA / 240VAC | I/P: 264 VAC O/P:Min LOAD Ta:25°C | L-FG: 0.4 mA N-FG: 0.38 mA |
| 5 | APPROVAL | TUV : Certificate NO : R50181371 UL : File NO : | | |

E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT |
|----|------------|--|--|-------------------------------|
| 1 | HARMONIC | EN61000-3-2 CLASS A CLASS C | I/P: 230VAC/50HZ LOAD:LED/ELECTRONIC LOAD O/P:100% LOAD Ta:25°C | PASS |
| 2 | CONDUCTION | EN55015 CLASS B | I/P: 230 VAC (50HZ) O/P:FULL/75% LOAD Ta:25°C | PASS Test by certified Lab |
| 3 | RADIATION | 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 LIGHT 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 LIGHT 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 |

RELIABILITY TEST

ENVIRONMENT TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|---|--|---|-------------------|----------|-----------------------------|-----------------------------|---|-----|--------|--------|---|----|--------|--------|---|-----|--------|--------|---|----|--------|--------|---|------|--------|--------|---|------|--------|--------|---|----|--------|--------|---|------|--------|--------|---|----|--------|--------|----|-----|--------|--------|----|------|--------|--------|----|------|--------|--------|----|-------|--------|--------|----|----|--------|--------|----|----|--------|--------|--|
| 1 | TEMPERATURE RISE TEST | MODEL : CEN-75-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 31.8 °C 2. HIGH AMBIENT BURN-IN : 61.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 40.5 °C | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 31.8 °C</th> <th>HIGH AMBIENT Ta= 40.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF2</td><td>55.1°C</td><td>62.8°C</td></tr> <tr><td>2</td><td>L1</td><td>64.7°C</td><td>71.9°C</td></tr> <tr><td>3</td><td>BD1</td><td>53.2°C</td><td>61.1°C</td></tr> <tr><td>4</td><td>Q1</td><td>62.2°C</td><td>69.9°C</td></tr> <tr><td>5</td><td>D100</td><td>62.0°C</td><td>69.9°C</td></tr> <tr><td>6</td><td>C105</td><td>62.7°C</td><td>69.9°C</td></tr> <tr><td>7</td><td>T1</td><td>68.2°C</td><td>75.1°C</td></tr> <tr><td>8</td><td>RTH1</td><td>62.6°C</td><td>70.0°C</td></tr> <tr><td>9</td><td>C5</td><td>61.5°C</td><td>68.7°C</td></tr> <tr><td>10</td><td>C46</td><td>59.9°C</td><td>68.6°C</td></tr> <tr><td>11</td><td>C125</td><td>55.6°C</td><td>63.1°C</td></tr> <tr><td>12</td><td>C150</td><td>54.7°C</td><td>62.4°C</td></tr> <tr><td>13</td><td>LF100</td><td>60.3°C</td><td>67.7°C</td></tr> <tr><td>14</td><td>U1</td><td>63.5°C</td><td>70.8°C</td></tr> <tr><td>15</td><td>D2</td><td>77.9°C</td><td>85.2°C</td></tr> </tbody> </table> | NO | Position | ROOM AMBIENT Ta= 31.8 °C | HIGH AMBIENT Ta= 40.5 °C | 1 | LF2 | 55.1°C | 62.8°C | 2 | L1 | 64.7°C | 71.9°C | 3 | BD1 | 53.2°C | 61.1°C | 4 | Q1 | 62.2°C | 69.9°C | 5 | D100 | 62.0°C | 69.9°C | 6 | C105 | 62.7°C | 69.9°C | 7 | T1 | 68.2°C | 75.1°C | 8 | RTH1 | 62.6°C | 70.0°C | 9 | C5 | 61.5°C | 68.7°C | 10 | C46 | 59.9°C | 68.6°C | 11 | C125 | 55.6°C | 63.1°C | 12 | C150 | 54.7°C | 62.4°C | 13 | LF100 | 60.3°C | 67.7°C | 14 | U1 | 63.5°C | 70.8°C | 15 | D2 | 77.9°C | 85.2°C | |
| NO | Position | ROOM AMBIENT Ta= 31.8 °C | HIGH AMBIENT Ta= 40.5 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | LF2 | 55.1°C | 62.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | L1 | 64.7°C | 71.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | BD1 | 53.2°C | 61.1°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Q1 | 62.2°C | 69.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | D100 | 62.0°C | 69.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | C105 | 62.7°C | 69.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | T1 | 68.2°C | 75.1°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | RTH1 | 62.6°C | 70.0°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | C5 | 61.5°C | 68.7°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | C46 | 59.9°C | 68.6°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | C125 | 55.6°C | 63.1°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | C150 | 54.7°C | 62.4°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | LF100 | 60.3°C | 67.7°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | U1 | 63.5°C | 70.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | D2 | 77.9°C | 85.2°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | OVER LOAD BURN-IN TEST | NO DAMAGE 1 HOUR (MIN) | I/P : 230 VAC O/P : O/P SHORT Ta : 25°C | TEST : OK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P : 295VAC/100VAC O/P : CV=14V Ta= -35 °C | TEST : OK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 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 : CV=14V Ta= 50 °C HUMIDITY= 95 %R.H | TEST : OK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | TEMPERATURE COEFFICIENT | ± 0.03 % (0-50°C) | I/P : 230 VAC O/P : FULL LOAD | ± 0.02 % (0-50°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | STORAGE TEMPERATURE TEST | 1. Thermal shock Temperature : -45°C ~ +90°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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



75W Single Output LED Power Supply

CEN-75 series

| | | | |
|----|-----------------------------|--|---------------------------------|
| 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 | CEN-75-15:SUPPOSE C 105 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= 50 °C LIFE TIME | (1) 214740HRS (2) 42470.8HRS |
| 10 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 522.2K HRS | |
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 65°C; 50,000 hours @ Tcase 55°C | |

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|-----------|----------------------------|-------------|------------|---------------|
| 2009/10/8 | RD SAMPLE | PASS | SANFORD SU | VINCENT TSENG |
| 2010/2/11 | PRODUCT SAMPLE W1002B54 | PASS | SANFORD SU | VINCENT TSENG |

2003/12/12 A50-F023