**MODEL：LPV-100-5**

**OUTPUT FUNCTION TEST**

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | RIPPLE & NOISE | V1: 80 mVp-p (Max ) | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | V1: 10 mVp-p (Max ) | PASS |
| 2 | OUTPUT VOLTAGE TOLERANCE | V1: -8 %~ +8 % (Max) | I/P: 100VAC / 264 VAC<br>O/P:FULL/ 0% LOAD<br>Ta:25℃ | V1: -3.7%~ +1.96 % | PASS |
| 3 | LINE REGULATION | V1: -1 %~ +1 % (Max) | I/P: 100 VAC ~ 264VAC<br>O/P:FULL LOAD<br>Ta:25℃ | V1: 0 %~ 0.12 % | PASS |
| 4 | LOAD REGULATION | V1: -6 %~ +6 % (Max) | I/P: 230 VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25℃ | V1: -1.96 %~ 1.96 % | PASS |
| 5 | SET UP TIME | 230VAC/ 2000 ms (Max)<br>115VAC/ 2000 ms (Max) | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | 230 VAC/644.98ms<br>115 VAC/1095.95ms | PASS |
| 6 | RISE TIME | 230VAC/ 25 ms (Max)<br>115 VAC/ 25 ms (Max) | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | 230 VAC/12.361ms<br>115 VAC/9.855ms | PASS |
| 7 | HOLD UP TIME | 230VAC/ 50ms (Typ)<br>115VAC/ 14ms (Typ) | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | 230VAC/128.27ms<br>115 VAC/27.576ms | PASS |
| 8 | OVER/UNDERSHOOT TEST | < ±10 % | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | TEST: +7.6 %<br>-7.6 % | PASS |
| 9 | DYNAMIC LOAD | V1: 1000 mVp-p | I/P: 230 VAC<br>O/P: (1)FULL /Min LOAD<br>90%DUTY/1KHZ<br>(2)FULL /Min LOAD<br>50%DUTY/120HZ<br>Ta:25℃ | (1) 852 mVp-p<br>(2) 856 mVp-p | PASS |

## INPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | INPUT VOLTAGE RANGE | 90 VAC~ 264 VAC | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25℃ | 90 V~ 264 V | PASS |
| | | | (1)I/P: LOW-LINE-3V= 87 V<br>HIGH-LINE+15%= 300 V<br>O/P:FULL/MIN LOAD<br>ON: 30 Sec . OFF: 30 Sec 10MIN<br>(2) I/P:230VAC<br>ON: 0.5 Sec . OFF: 0.5 Sec 20MIN<br>( AC POWER ON/OFF NO DAMAGE ) | TEST:<br>(1) OK<br>(2) OK | |
| 2 | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE OSC | I/P: 90 VAC ~264 VAC<br>O/P:FULL~MIN LOAD<br>Ta:25℃ | TEST: OK | PASS |
| 3 | EFFICIENCY | 80 % (Typ) | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | 80.68% | PASS |
| 4 | INPUT CURRENT | 230 V/ 1.2 A (Typ)<br>115 V/ 2.2 A (Typ) | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | I =0.741A/ 230VAC<br>I =1.256A/ 115VAC | PASS |
| 5 | INRUSH CURRENT | 230 V/ 75 A<br>115 V/ 30 A<br>COLD START | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | I =68.195A/ 230VAC<br>I =25.851A/ 115VAC | PASS |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | OVER LOAD PROTECTION | 110%~ 150 %<br>RATED OUTPUT POWER | I/P: 264 VAC<br>I/P: 230 VAC<br>I/P: 100 VAC<br>O/P:TESTING<br>Ta:25℃ | 118.3 %/264VAC<br>124.6 %/ 230VAC<br>123.3 %/ 100 VAC<br>Hiccup Mode | PASS |
| 2 | OVER VOLTAGE PROTECTION | CH1: 5.75 V~ 6.75 V | I/P: 264 VAC<br>I/P: 230 VAC<br>I/P: 90 VAC<br>O/P:MIN LOAD<br>Ta:25℃ | 6.32 V/264VAC<br>6.37 V/ 230VAC<br>6.38 V/ 90 VAC<br>Shunt down Re- power ON | PASS |
| 3 | SHORT PROTECTION | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 264 VAC<br>O/P: FULL LOAD<br>Ta:25℃ | NO DAMAGE<br>Hiccup Mode | PASS |

## ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： LPV-100-5<br>1. ROOM AMBIENT BURN-IN： 2 HRS<br>I/P: 230 VAC O/P: 100% LOAD Ta= 30.5 ℃<br>2. HIGH AMBIENT BURN-IN： 2 HRS<br>I/P: 230 VAC O/P: 100% LOAD Ta= 42 ℃
<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 30.5 ℃</th><th>HIGH AMBIENT Ta= 42 ℃</th></tr>
<tr><td>1</td><td>LF1</td><td>TR6091</td><td>55.6℃</td><td>64℃</td></tr>
<tr><td>2</td><td>C6</td><td>100u/400V KXG</td><td>61.9℃</td><td>70.9℃</td></tr>
<tr><td>3</td><td>Q1</td><td>STF14NM65N</td><td>70.3℃</td><td>79.8℃</td></tr>
<tr><td>4</td><td>C47</td><td>220u/35V YXG-LLC</td><td>69.6℃</td><td>79.4℃</td></tr>
<tr><td>5</td><td>T1</td><td>TF2119</td><td>79.1℃</td><td>90.5℃</td></tr>
<tr><td>6</td><td>D100</td><td>SBL40L45CT</td><td>83.3℃</td><td>95.8℃</td></tr>
<tr><td>7</td><td>D101</td><td>SBL40L45CT</td><td>83.9℃</td><td>96.3℃</td></tr>
<tr><td>8</td><td>C105</td><td>3900u/10V ZLH</td><td>76.3℃</td><td>88.5℃</td></tr>
<tr><td>9</td><td>C106</td><td>3900u/10V ZLH</td><td>80.4℃</td><td>93.6℃</td></tr>
<tr><td>10</td><td>U1</td><td>NCP1380BDR2G</td><td>61.2℃</td><td>70.8℃</td></tr>
<tr><td>11</td><td>ZD1</td><td>2W 39KΩ</td><td>84.2℃</td><td>91.1℃</td></tr>
<tr><td>12</td><td>D1</td><td>1N5406</td><td>77.8℃</td><td>87.5℃</td></tr>
<tr><td>13</td><td>BD1</td><td>D4SB80</td><td>57.6℃</td><td>66.8℃</td></tr>
</table></td><td>PASS</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE<br>1 HOUR ( MIN )</td><td>I/P: 230 VAC<br>O/P: 125 % LOAD<br>Ta:25℃</td><td>TEST： OK</td><td>PASS</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE<br>TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P: 264 VAC/100 VAC<br>O/P: 100% LOAD<br>Ta= -25 ℃</td><td>TEST： OK</td><td>PASS</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST</td><td>AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 40 ℃<br>NO DAMAGE</td><td>I/P: 272 VAC<br>O/P:FULL LOAD<br>Ta= 40 ℃<br>HUMIDITY= 95 %R.H</td><td>TEST： OK</td><td>PASS</td></tr>
<tr><td>5</td><td>TEMPERATURE<br>COEFFICIENT</td><td>± 0.03 %(0~50℃)</td><td>I/P: 230 VAC<br>O/P:FULL LOAD</td><td>± 0.004 %(0~50℃)</td><td>PASS</td></tr>
<tr><td>6</td><td>STORAGE TEMPERATURE TEST</td><td colspan="2">1. Thermal shock Temperature： -40℃~ +80℃<br>2. Temperature change rate ：25℃ / 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</td><td>TEST： OK</td><td>PASS</td></tr>
<tr><td>7.</td><td>THERMAL SHOCK TEST</td><td colspan="2">1. Thermal shock Temperature： - 30 ℃~ + 45 ℃<br>2. Temperature change rate ：25℃ / 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/Full Load 58SEC ON/2SEC OFF</td><td>TEST： OK</td><td>PASS</td></tr>
</table>

| | | | | |
|---|---|---|---|---|
| 8 | 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:1 hour in each axis (X.Y.Z)<br>(6) Ta:25℃ | TEST： OK | PASS |
| 9 | CAPACITOR<br>LIFE CYCLE | SUPPOSE C106 IS THE MOST CRITICAL COMPONENT<br>(1) I/P: 230 VAC O/P:FULL LOAD Ta= 25 ℃ LIFE TIME= 88982.4 HRS<br>(2) I/P: 230 VAC O/P:FULL LOAD Ta= 40 ℃ LIFE TIME= 27931.2 HRS<br>(3) I/P: 230 VAC O/P:75% LOAD Ta= 40 ℃ LIFE TIME= 60278.4 HRS<br>(4) I/P: 230 VAC O/P:50% LOAD Ta= 40 ℃ LIFE TIME= 131155.2 HRS | | PASS |
| 10 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE: 703K HRS | | PASS |
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure(Expected Life) :<br>20,000 hours @ Tcase 85℃; 50,000 hours @ Tcase70℃ | | PASS |

## SAFETY TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | WITHSTAND VOLTAGE | I/P-O/P: 3 KVAC/min<br>EN 60950 | I/P-O/P: 3.6 KVAC/min<br>Ta:25℃ | I/P-O/P: 2.280 mA<br>NO DAMAGE | PASS |
| 2 | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ | I/P-O/P: 500 VDC<br>Ta:25℃ | I/P-O/P: ＞9999 MΩ<br>NO DAMAGE | PASS |
| 3 | LEAKAGE CURRENT | < 0.25 mA / 240VAC<br>EN 60950 | I/P: 264 VAC<br>O/P:NO LOAD<br>Ta:25℃ | L-FG: 0.005 mA<br>N-FG: 0.003 mA | PASS |

## E.M.C TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | HARMONIC | EN61000-3-2<br>CLASS A | I/P: 220/230/240 VAC/50HZ<br>O/P:100%/75%/50%/25% LOAD<br>Ta:25℃ | PASS | PASS |
| 2 | CONDUCTION | EN55022<br>CLASS B | I/P:230 VAC (50HZ) /115V(60HZ)<br>O/P:FULL/50% LOAD<br>Ta:25℃ | PASS<br>Test by certified Lab | PASS |
| 3 | RADIATION | EN55022<br>CLASS B | I/P: 230 VAC (50HZ)/115V(60HZ)<br>O/P:FULL LOAD<br>Ta:25℃ | PASS<br>Test by certified Lab | PASS |
| 4 | E.S.D | EN61000-4-2<br>INDUSTRY<br>AIR:8KV / Contact:4KV | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25℃ | CRITERIA A | PASS |
| 5 | E.F.T | EN61000-4-4<br>INDUSTRY<br>INPUT: 2KV | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25℃ | CRITERIA A | PASS |
| 6 | SURGE | IEC61000-4-5<br>INDUSTRY<br>L-N :2KV<br>L,N-PE:4KV | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25℃ | CRITERIA A | PASS |

| | |
|---|---|
| 7 | Test by certified Lab & Test Report Prepare |

**COMPONENT STRESS TEST**

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | Power Transistor<br>( D to S) or (C to E) **Peak Voltage** | Q 1 Rated<br>STF14NM65N : 650 V/ 12 A | I/P:High-Line +3V = 280 V<br>O/P: (1)Full Load Turn on<br>(2)Output Short<br>(3)Dynamic Load 50% Load/<br>Min. Load 90%Duty/1KHz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>Ta:25℃ | (1) 640 V<br>(2) 582 V<br>(3) 648 V<br>(4) 612 V | PASS |
| 2 | Diode **Peak Voltage** | D 100 Rated<br>SBL40L45CT: 45V/40A | I/P:High-Line +3V = 280 V<br>O/P: (1)Full Load Turn on<br>(2)Output Short<br>(3)Dynamic Load 50% Load/<br>Min. Load 90%Duty/1KHz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>Ta:25℃ | (1) 34.4 V<br>(2) 30.6 V<br>(3) 35.0 V<br>(4) 35.2 V | PASS |
| 3 | Clamp Diode **Peak Voltage** | D 1 Rated<br>1N5406 : 600 V 3 A | I/P:High-Line +3V = 280 V<br>O/P: (1)Dynamic Load 50% Load/<br>Min. Load 90%Duty/1KHz<br>(2)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>Ta:25℃ | (1) 448 V<br>(2) 424 V | PASS |
| 4 | **Control IC Voltage Test** | U 1 Rated<br>NCP1380BDR2G : 28 V | I/P:High-Line +3V =280 V<br>O/P: (1) Output Short<br>(2)O.L.P<br>(3)O.V.P<br>Ta:25℃ | (1) 17.2 V<br>(2) 17.2 V<br>(3) 16.3 V | PASS |

**2007/11/26 A50-G058**

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|---|---|---|---|---|
| 2010/5/20 | RD SAMPLE | PASS | ZOULF | HOWAY |
| 2011/1/4 | PRODUCT SAMPLE (**W1012I091**) | PASS | ZOULF | HOWAY |
| 2011/3/31 | PRODUCT SAMPLE (**W1103G131**) | PASS | ZOULF | HOWAY |