**MODEL：SD-500L-48**

**OUTPUT FUNCTION TEST**

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | RIPPLE & NOISE | V1:150 mVp-p (Max ) | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | V1: 42 mVp-p (Max ) | P |
| 2 | OUTPUT VOLTAGE<br>ADJUST RANGE | CH1:46V~ 60V | I/P: 48VDC<br>O/P:MIN LOAD<br>Ta:25℃ | 44.9 V~61.9 V | P |
| 3 | OUTPUT VOLTAGE<br>TOLERANCE | V1: 1%~ -1% | I/P: 46 VDC / 60 VDC<br>O/P:FULL/ MIN LOAD<br>Ta:25℃ | V1: 0.02 %~ -0.02 % | P |
| 4 | LINE REGULATION | V1: 0.5 %~ -0.5 % | I/P: 24VDC ~72VDC<br>O/P:FULL LOAD<br>Ta:25℃ | V1: 0.02 %~ -0.02 % | P |
| 5 | LOAD REGULATION | V1: 0.5 %~ -0.5 % | I/P: 48VDC<br>O/P:FULL ~MIN LOAD<br>Ta:25℃ | V1: 0 %~ 0 % | P |
| 6 | SET UP TIME | 500 ms | I/P: 48VDC<br>O/P:FULL LOAD<br>Ta:25℃ | 137 ms | P |
| 7 | RISE TIME | 50ms | I/P: 48VDC<br>O/P:FULL LOAD<br>Ta:25℃ | 19 ms | P |
| 8 | OVER/UNDERSHOOT TEST | ＜±5% | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | TEST: ＜5 % | P |
| 9 | DYNAMIC LOAD | V1: 4800mVp-p | I/P: 48 VDC<br>O/P:FULL /Min LOAD<br>90%DUTY/1KHZ<br>Ta:25℃ | 440 mVp-p | P |

## INPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | INPUT VOLTAGE RANGE | 24VDC~72VDC | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25℃ | 18.5 V~72 V | P |
| | | | I/P:<br>LOW-LINE-0.2V= 23.8 V<br>HIGH-LINE+5%= 75.6 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 | EFFICIENCY | 89 % (TYP) | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | 89.8 % | P |
| 3 | INPUT CURRENT | 12 A(TYP) | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | I = 11.88 A | P |
| 4 | INRUSH CURRENT | 60A (TYP)<br>COLD START | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | I = 32 A | P |
| 5 | CURRENT (at no load) | 0.2A (MAX) | I/P: 48 VDC<br>O/P:NO LOAD<br>Ta:25℃ | I = 0.13 A | P |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | OVER LOAD PROTECTION | 105 %~ 125 % | I/P: 48 VDC<br>O/P:TESTING<br>Ta:25℃ | 112 %<br>Constant Current Limiting , Shut down O/P voltage ,after about 5 sec Re-power ON to recover | P |
| 2 | OVER VOLTAGE PROTECTION | CH1: 62V~ 68V | I/P: 48 VDC<br>O/P:MIN LOAD<br>Ta:25℃ | 64.2 V<br>Shut down Re- power ON | P |
| 3 | OVER TEMPERATURE PROTECTION | SPEC:<br>TSW2 > 80℃ ±5℃ O.T.P<br>TSW1 > 80℃ ±5℃ O.T.P<br>NO DAMAGE | I/P: 48 VDC<br>O/P:FULL LOAD | O.T.P. Active<br>Shut down o/p volotage，recovers automatically after temperature goes down | P |
| 4 | SHORT PROTECTION | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 72 VDC<br>O/P: FULL LOAD<br>Ta:25℃ | NO DAMAGE<br>Constant Current Limiting , Shut down O/P voltage ,after about 5 sec Re-power ON to recover | P |

## CONTROL FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | FAN SPEED CONTROL | NO LOAD= 8.5V ± 1V<br>FULL LOAD= 12.6V ± 0.5V | I/P: 48VDC<br>O/P:FULL LOAD<br>Ta:25℃ | NO LOAD= 8.7 V<br>FULL LOAD= 12.7 V | P |
| 2 | REMOTE CONTROL | Remote on/off control becomes available by applying voltage in CN3 (RC/RCG)<br>Connection method: Fig 1.2(A) / Fig 1.2(B)<br>Output on: SW Open / V=0~0.8VDC<br>Output off: SW Close / V=4VDC~10VDC<br>Fig 1.2(A)/ Fig 1.2(B) see SPEC function manual | I/P: 48VDC<br>O/P:FULL LOAD<br>Ta:25℃ | a. OK<br>b. 0 V~2.6 V POWER ON<br>2.7V~10 V POWER OFF | P |
| 3 | REMOTE SENSE | S+ / S-<br>>0.3V | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | ＞0.3 V | P |
| 4 | OUTPUT OK SIGNAL | OPEN COLLECTOR SIGNAL LOW WHEN PSU TURN ON,MAX.SINK CURRENT 10mA,external voltage is 13V<br>0~0.5V OUTPUT STATUS ON<br>12~13V OUTPUT STATUS OFF | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | SINK CURRENT: 10 mA<br>0.04 V OUTPUT STATUS ON<br>12.8VOUTPUT STATUS OFF | P |

## ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</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： SD-500L-48<br>1. ROOM AMBIENT BURN-IN： 1.5 HRS<br>I/P:48 VDC O/P: FULL LOAD Ta= 30.7 ℃<br>2. HIGH AMBIENT BURN-IN： 13 HRS<br>I/P: 48 VDC O/P: FULL LOAD Ta= 54.7 ℃<br><br>
<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 30.7 ℃</th><th>HIGH AMBIENT Ta= 54.7 ℃</th></tr>
<tr><td>1</td><td>LF1</td><td>TR784</td><td>35.3℃</td><td>61.3℃</td></tr>
<tr><td>2</td><td>RY1</td><td>RELAY</td><td>36.5℃</td><td>62.3℃</td></tr>
<tr><td>3</td><td>L2</td><td>TF1725</td><td>40.7℃</td><td>66.7℃</td></tr>
<tr><td>4</td><td>D5</td><td>MBR20H100CT 20A/100V</td><td>39.7℃</td><td>65.1℃</td></tr>
<tr><td>5</td><td>U1</td><td>UCC28019D</td><td>41.7℃</td><td>68.5℃</td></tr>
<tr><td>6</td><td>C5</td><td>1000u/100V 105℃ MXR</td><td>41.4℃</td><td>67.3℃</td></tr>
<tr><td>7</td><td>Q2</td><td>STP80NF12 80A/120V</td><td>43.4℃</td><td>69.1℃</td></tr>
<tr><td>8</td><td>ZD10</td><td>P6KE100A</td><td>48.7℃</td><td>73.7℃</td></tr>
<tr><td>9</td><td>D300</td><td>SBD S100 1A/100V</td><td>55.3℃</td><td>79.7℃</td></tr>
<tr><td>10</td><td>C75</td><td>220u/25V KY 105℃ 7Kh</td><td>39.8℃</td><td>65.2℃</td></tr>
<tr><td>11</td><td>U9</td><td>TNY280PN</td><td>47.4℃</td><td>73.4℃</td></tr>
<tr><td>12</td><td>C110</td><td>470u/63V L10Kh YXF</td><td>37.2℃</td><td>60.6℃</td></tr>
<tr><td>13</td><td>Q201</td><td>IRFP264 38A/250V</td><td>50.2℃</td><td>77.2℃</td></tr>
<tr><td>14</td><td>T1</td><td>TF1718</td><td>64.3℃</td><td>92.8℃</td></tr>
<tr><td>15</td><td>D100</td><td>S20LC30 20A/300V</td><td>57.1℃</td><td>80.4℃</td></tr>
<tr><td>16</td><td>L100</td><td>TF1724</td><td>51.4℃</td><td>76.4℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE<br>1 HOUR ( MIN )</td><td>I/P: 48 VDC<br>O/P: 113 % LOAD<br>Ta:25℃</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE<br>TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P: 48 VDC<br>O/P: 100 % LOAD<br>Ta= -25 ℃</td><td>TEST： OK</td><td>P</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 50 ℃<br>NO DAMAGE</td><td>I/P: 72 VDC<br>O/P:FULL LOAD<br>Ta= 50 ℃<br>HUMIDITY= 95 %R.H</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE<br>COEFFICIENT</td><td>± 0.02 %(0~50℃)</td><td>I/P: 48 VDC<br>O/P:FULL LOAD</td><td>± 0.01 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">1 Carton & 1 Set<br>(1) Waveform: Sine Wave<br>(2) Frequency:10~500Hz<br>(3) Sweep Time:10min/sweep cycle<br>(4) Acceleration:2G<br>(5) Test Time:1 hour in each axis (X.Y.Z)<br>(6) Ta:25℃</td><td>TEST： OK</td><td>P</td></tr>
</table>

## SAFETY TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | WITHSTAND VOLTAGE | I/P-O/P: 2 KVAC/min<br>I/P-FG: 1.5 KVAC/min<br>O/P-FG: 0.5 KVAC/min | I/P-O/P: 2.4 KVAC/min<br>I/P-FG: 1.8 KVAC/min<br>O/P-FG: 0.6 KVAC/min<br>Ta:25℃ / 70%RH | I/P-O/P: 4.29 mA<br>I/P-FG: 4.06 mA<br>O/P-FG: 5.41 mA<br>NO DAMAGE | P |
| 2 | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ<br>I/P-FG: 500VDC>100MΩ<br>O/P-FG:500VDC>100MΩ | I/P-O/P: 500 VDC<br>I/P-FG: 500 VDC<br>O/P-FG: 500 VDC<br>Ta:25℃ | I/P-O/P: 6.02 GΩ<br>I/P-FG: 1.84 GΩ<br>O/P-FG: 26.1 GΩ<br>NO DAMAGE | P |
| 3 | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ | 40 A / 2min<br>Ta:25℃ / 70%RH | 7 mΩ | P |
| 4 | APPROVAL | TUV: Certificate NO :<br>UL: File NO : | | | N |

## E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | RADIATION | EN55022<br>CLASS B | I/P: 48VDC<br>O/P:FULL LOAD<br>Ta:25℃ | PASS<br>Test by certified Lab | P |
| 2 | E.S.D | EN61000-4-2<br>LIGHT INDUSTRY<br>AIR:8KV / Contact:4KV | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | CRITERIA A | P |
| 3 | E.F.T | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT: 1KV | I/P: 48 VDC<br>O/P:FULL LOAD<br>Ta:25℃ | CRITERIA A | P |
| 4 | Test by certified Lab & Test Report Prepare | | | | |

## M.T.B.F & LIFE CYCLE CALCULATION

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | CAPACITOR<br>LIFE CYCLE | SD-500L-48：SUPPOSE C 110 IS THE MOST CRITICAL COMPONENT<br>I/P:48VDC O/P:FULL LOAD Ta= 30.7 ℃ LIFE TIME= 1957680 HRS<br>I/P: 48VDC O/P:FULL LOAD Ta= 54.7 ℃ LIFE TIME= 360720 HRS | | | P |
| 2 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE: 196.3K HRS | | | P |
| 3 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure : Above 30,000 hours @ TA 50℃ | | | 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** | Q201 Rated<br>IRFP264 38A/250V | I/P:High-Line +3V = 75 V<br>O/P: (1)Full Load Turn on<br>(2) Output Short<br>Ta:25℃ | (1) 212 V<br>(2) 210 V | P |
| 2 | Diode Peak **Voltage** | D100 Rated<br>S20LC30 20A/300V | I/P:High-Line +3V = 75 V<br>O/P: (1)Full Load Turn on<br>(2)Output Short<br>Ta:25℃ | (1) 256 V<br>(2) 258 V | P |
| 3 | **Input Capacitor Voltage** | C5 Rated<br>: 1000 u / 100V 105 ℃ | I/P:High-Line +3V = 75 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℃ | (1) 88 V<br>(2) 89 V<br>(3) 89 V | P |
| 4 | **Control IC Voltage Test** | U2 Rated<br>KA3846 :40 V | I/P:High-Line +3V = 75 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℃ | (1) 12.46 V<br>(2) 12.63 V<br>(3) 12.63 V | P |

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|---|---|---|---|---|
| 2008/1/21 | RD SAMPLE | PASS | SANFORD SU | VINCENT TSENG |
| 2008/3/17 | PRODUCT SAMPLE W0802B72 | PASS | SANFORD SU | VINCENT TSENG |
| 2008/5/29 | PRODUCT SAMPLE W0804B61 | PASS | SANFORD SU | VINCENT TSENG |

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