**MODEL：TS-200-212**

**OUTPUT FUNCTION TEST**

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | RATED POWER (TYP) | 200W | IP: 12VDC<br>Ta:25℃ | 200 W | P |
| 2 | WAVEFORM | True sine wave (THD<3%) | IP: 12VDC<br>OP: FULL LOAD/NO LOAD<br>Ta:25℃ | FULL LOAD: 1.1 %<br>NO LOAD: 0.25 % | P |
| 3 | FREQUENCY | 50/60HZ ± 0.1HZ | IP: 12VDC<br>OP: FULL LOAD/NO LOAD<br>Ta:25℃ | FULL LOAD: 49.98 HZ<br>NO LOAD: 49.99 HZ | P |
| 4 | AC REGULATION (TYP) | 3%~-3% | IP: 12VDC<br>OP: FULL LOAD/NO LOAD<br>Ta:25℃ | 0.65% ~ -0.65 % | P |
| 5 | MAXIMUM OUTPUT POWER (TYP) | 230W/180sec<br>300w/10sec<br>400W / 30cycle | IP: 12VDC<br>OP:TESTING<br>Ta:25℃ | 224 W 180 SEC<br>253 W 11 SEC<br>379 W 28 cycle<br>Shut down o/p voltage , re-power on to recover | P |

**INPUT FUNCTION TEST**

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | DC CURRENT (TYP) | 20A | IP: 12VDC<br>OP:FULL LOAD<br>Ta:25℃ | 19.5A | P |
| 2 | NO LOAD POWER DRAW | ≤1.25 A | IP: 12VDC<br>OP:NO LOAD<br>Ta:25℃ | 1.13W | P |
| 3 | OFF MODE DRAW CURRENT | ≤1mA | IP: SW OFF<br>OP:NO LOAD<br>Ta:25℃ | 0.35mA | P |
| 4 | VOLTAGE RANGE (TYP) | 10.5VDC~15VDC | IP: TESTING<br>OP:NO LOAD<br>Ta:25℃ | 10.53VDC~ 15 VDC | P |
| 5 | EFFICIENCY (TYP) | 86 % | IP: 12VDC<br>OP: 200W<br>Ta:25℃ | 87% | P |

## INPUT PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | BAT LOW ALARM | 11.3VDC ±4% | IP: TESTING<br>OP: NO LOAD<br>SW:ON<br>Ta:25℃ | 11.1V | P |
| 2 | BAT LOW SHUT DOWN | 10.5VDC ± 4% | IP: TESTING<br>OP: NO LOAD<br>SW:ON<br>Ta:25℃ | 10.53V<br>Shut down Recovery | P |
| 3 | BAT. RECOVERY VOLTAGE | 12VDC~15VDC | IP: TESTING<br>OP: NO LOAD<br>SW:ON<br>Ta:25℃ | 12.9V | P |
| 4 | BAT POLARITY | BY INTERNAL FUSE | IP: 12VDC<br>OP: NO LOAD<br>SW:ON<br>Ta:25℃ | OK | P |

## OUTPUT PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | OVER TEMPERATURE | 85℃ ±5℃ (RTH1) detect power MOSFET | IP: 12VDC<br>OP: FULL LOAD<br>SW:ON<br>Ta:25℃ | O.T.P Active<br>Shut down o/p voltage , re-power on to recover | P |
| 2 | OUTPUT SHORT | Shut-off :Shut down o/p voltage , re-power onto recover | IP: 12VDC<br>OP: FULL LOAD<br>SW:ON<br>Ta:25℃ | Shut down o/p voltage , re-power on to recover | P |
| 3 | OVER LOAD (TYP) | 105%~115% LOAD for 180sec<br>115%~150% LOAD for 10sec | IP: 12VDC<br>OP:TESTING<br>Ta:25℃ | 230 W 180 SEC<br>300 W 10SEC<br>Shut down o/p voltage , re-power on to recover | P |

## APPLICATION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | INDUCTION MOTOR | 0.5HP | IP: 12VDC<br>OP:0.5HP<br>SW:ON<br>Ta:25℃ | INVERTER TURN ON/OFF :OK<br>INDUCTION MOTOR ON/OFF:OK | P |
| 2 | INCANDESCENT LAMPS | 200W | IP: 12VDC<br>OP: 200W<br>SW:ON<br>Ta:25℃ | INVERTER TURN ON/OFF :OK<br>INCANDESCENT LAMPS ON/OFF:OK | P |

**LED instruction** ：(★ Flash ● Light ON)

| LED IS TREECOLOR LIGHT | status | RESULT |
|---|---|---|
| ● | Inverter fail | P |
| ★ | Remote OFF | P |
| ● | Inverter OK | P |

**VOLTAGE AND FREQUENCY SETTING CODES**

| Vout | 100V | 110V | 115V | 120V |
|---|---|---|---|---|
| LED | ● | ★ | ● | ★ |
| RESULT | P | P | P | P |

| Frequency | LED | RESULT |
|---|---|---|
| 50HZ | ● | P |
| 60HZ | ★ | 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：TS-200-212<br>1. ROOM AMBIENT BURN-IN：3.5 HRS<br>I/P: 12 VDC O/P: FULL LOAD Ta=30℃<br>2. HIGH AMBIENT BURN-IN：3 HRS<br>I/P: 12 VDC O/P: FULL LOAD Ta=40.2℃
<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 30 ℃</th><th>HIGH AMBIENT Ta= 40.2℃</th></tr>
<tr><td>6</td><td>C301</td><td>2200u/16V L10Kh 12.5*25 YXG</td><td>61.7℃</td><td>72.7℃</td></tr>
<tr><td>7</td><td>C302</td><td>106/250V 5% P=32.5</td><td>69.7℃</td><td>81.1℃</td></tr>
<tr><td>8</td><td>T310</td><td>TF1854 ETD-39</td><td>93.0℃</td><td>105.4℃</td></tr>
<tr><td>9</td><td>Q311</td><td>STP75NF75 80A/75V</td><td>56.8℃</td><td>68.1℃</td></tr>
<tr><td>10</td><td>LF500</td><td>LF102-R1 ET-24V 3.8A 1.3mH B</td><td>60.3℃</td><td>72.1℃</td></tr>
<tr><td>11</td><td>D400</td><td>YG975C6R 20A/600V</td><td>89.3℃</td><td>101.4℃</td></tr>
<tr><td>12</td><td>L500</td><td>TR833 T150-52 9.5m</td><td>82.6℃</td><td>94.4℃</td></tr>
<tr><td>13</td><td>Q540</td><td>STP21NM60N 17A/600V</td><td>57.5℃</td><td>69.4℃</td></tr>
<tr><td>14</td><td>L300</td><td>TF1848 ETD-24</td><td>70.4℃</td><td>81.6℃</td></tr>
<tr><td>15</td><td>T600</td><td>TF1857 EEL-19</td><td>74.1℃</td><td>85.4℃</td></tr>
<tr><td>16</td><td>Q600</td><td>STP60NF06L 60A/60V</td><td>74.0℃</td><td>84.8℃</td></tr>
<tr><td>17</td><td>RG630</td><td>RG LM317T 1.5A TO220</td><td>55.1℃</td><td>66.3℃</td></tr>
<tr><td>18</td><td>D600</td><td>HER104 1A/300V</td><td>69.5℃</td><td>80.4℃</td></tr>
<tr><td>19</td><td>U100</td><td>PIC18F65J10</td><td>67.1℃</td><td>78.3℃</td></tr>
<tr><td>20</td><td>U600</td><td>TL3845D-8 TI SO-8</td><td>56.5℃</td><td>67.5℃</td></tr>
<tr><td>21</td><td>C733</td><td>47u/35V L6Kh 5*11 ZLH</td><td>65.3℃</td><td>76.1℃</td></tr>
<tr><td>22</td><td>RTH1</td><td>NTC 10KΩ 4Φ TTC3A103F34D1EY 1%</td><td>62.9℃</td><td>74.2℃</td></tr>
<tr><td>23</td><td>C400</td><td>150u/450V 105℃ 22*35 HU5</td><td>73.4℃</td><td>85.3℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>LOW TEMPERATURE<br>TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>IP: 12VDC<br>OP:FULL LOAD<br>Ta= -10℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</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>IP: 14.6VDC<br>OP:FULL LOAD<br>Ta:= 40℃<br>HUMIDITY= 95 %R.H</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>4</td><td>VIBRATION TEST</td><td colspan="2">1 Carton & 1 Set<br>(1) Waveform: Sine Wave (2) Frequency:10~500Hz<br>(3) Sweep Time:10min/sweep cycle (4) Acceleration:3G<br>(5) Test Time:1 hour in each axis (X.Y.Z) (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 | BAT I/P-AC O/P: 3 KVAC/min<br>AC O/P-FG: 1.5 KVAC/min | BAT I/P-AC O/P: 3.6 KVAC/min<br>AC O/P-FG: 1.8 KVAC/min<br>Ta:25℃ | BAT I/P-AC O/P: 4.26 mA<br>AC O/P-FG: 3.56 mA<br>NO DAMAGE | P |
| 2 | ISOLATION RESISTANCE | BAT I/P-AC O/P:500VDC>100MΩ<br>BAT I/P-FG: 500VDC>100MΩ | BAT I/P-AC O/P: 500 VDC<br>BAT I/P-FG: 500 VDC<br>Ta:25℃ | BAT I/P-AC O/P: 1.05 GΩ<br>BAT I/P-FG: 1.01 GΩ<br>NO DAMAGE | P |
| 3 | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ | 40 A / 2min<br>Ta:25℃ | 11 mΩ | P |
| 4 | APPROVAL | TUV: Certificate NO :<br>UL: File NO : | | | N/A |

## E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | RADIATION | EN 55022<br>CLASS A | I/P:12 VDC<br>O/P: :FULL/50% LOAD<br>Ta:25℃ | PASS | P |
| 2 | E.S.D | EN 61000-4-2<br>LIGHT INDUSTRY<br>AIR:8KV / Contact:4KV | I/P: 12VDC<br>O/P:100 %LOAD<br>Ta:25℃ | CRITERIA A | P |
| 3 | E.F.T | EN 61000-4-4<br>LIGHT INDUSTRY<br>INPUT: 1KV | I/P: 12VDC<br>O/P: 100 %LOAD<br>Ta:25℃ | CRITERIA A | P |
| 4 | SURGE | EN 61000-4-5<br>LIGHT INDUSTRY<br>L-N :1KV<br>L,N-PE:1KV | I/P: 12 VDC<br>O/P: 100 %LOAD<br>Ta:25℃ | CRITERIA A | P |
| 5 | 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 | TS-200-212: SUPPOSE C301 IS THE MOST CRITICAL COMPONENT<br>I/P: 12VDC O/P:FULL LOAD Ta= 25℃ LIFE TIME=283262 HRS<br>I/P: 12VDC O/P:FULL LOAD Ta= 40℃ LIFE TIME=94719 HRS | | | P |

## COMPONENT STRESS TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|---|---|---|---|---|---|
| 1 | DC TO DC<br>Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q 310 Rated<br>STP75NF75 80A/75V | I/P:14.5 VDC<br>O/P: (1)Full Load Turn On<br>(2) Output Short<br>Ta:25℃ | (1) 45 V<br>(2) 41 V | P |
| 2 | DCTO DC<br>Diode Peak Voltage | D 400 Rated<br>YG975C6R 20A/600V | I/P:14.5 VC<br>O/P: (1)Full Load Turn On<br>(2) Output Short<br>Ta:25℃ | (1) 466 V<br>(2) 468 V | P |
| 3 | DC BUS Capacitor Voltage | C400 Rated<br>330u/250V 105℃ 22*30 HU5 | I/P:14.5VDC<br>O/P: (1)Full Load Turn SW On /Off<br>(2) Min load Turn SW On /Off<br>Ta:25℃ | (1) 430 V<br>(2) 440 V | P |
| 4 | DC TO AC<br>Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q 520 Rated<br>STP21NM60N 17A/600V | I/P:14.5 VDC<br>O/P: (1)Full Load Turn On<br>(2) Output Short<br>Ta:25℃ | (1) 500 V<br>(2) 544 V | P |
| 5 | DC TO FAN<br>Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q600 Rated<br>STP60NF06L 60A/60V | I/P:14.5VDC<br>O/P: (1)Full Load Turn On<br>(2) Output Short<br>Ta:25℃ | (1) 50 V<br>(2) 48 V | P |
| 6 | DCTO FAN<br>Diode Peak Voltage | D 700 Rated<br>HER203 2A/200V | I/P:14.5 VDC<br>O/P: (1)Full Load Turn On<br>(2) Output Short<br>Ta:25℃ | (1) 32 V<br>(2) 55 V | P |
| 7 | DC TO CPU<br>Power Transistor<br>( D to S) or (C to E) Peak Voltage | D710 Rated<br>HER203 2A/200V | I/P:14.5 VDC<br>O/P: (1)Full Load Turn On<br>(2) Output Short<br>Ta:25℃ | (1) 80 V<br>(2) 88 V | P |
| 8 | FAN TO CPU<br>Diode Peak Voltage | D 730 Rated<br>MBR1200 1A/200V | I/P:14.5 VDC<br>O/P: (1)Full Load Turn On<br>(2) Output Short<br>Ta:25℃ | (1) 97 V<br>(2) 104 V | P |

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|---|---|---|---|---|
| 2009/4/15 | RD SAMPLE | PASS | SANFORD SU | VINCENT TSENG |
| 2009/6/11 | PRODUCT SAMPLE W0904E57 | PASS | SANFORD SU | VINCENT TSENG |

2003/12/12 A50-F023