



# Test Report: RSP-320-27

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320W Single Output With PFC Function

## ■ 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 : 200 mVp-p (Max)                            | I/P : 230VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | V1 : 153 mVp-p (Max)  | P       |
| 2  | OUTPUT VOLTAGE ADJUST RANGE | CH1 : 26V ~31.5V                                | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C   | 23.52 V ~ 32.9 V / 230 VAC<br>23.52 V ~ 32.9 V / 115 VAC        | P       |
| 3  | OUTPUT VOLTAGE TOLERANCE    | V1 : 1 %~ -1% (Max)                             | I/P : 100VAC / 264 VAC<br>O/P : FULL/ MIN LOAD<br>Ta : 25°C   | V1 : 0.05 %~ -0.05 %  | P       |
| 4  | LINE REGULATION             | V1 : 0.2%~ -0.2% (Max)                          | I/P : 100VAC ~ 264 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | V1 : 0.03 %~ -0.03 %  | P       |
| 5  | LOAD REGULATION             | V1 : 0.5%~ -0.5 % (Max)                         | I/P : 230 VAC<br>O/P : FULL ~MIN LOAD<br>Ta : 25°C  | V1 : 0.03 %~ -0.03 %  | P       |
| 6  | SET UP TIME                 | 230VAC : 1500 ms (Max)<br>115VAC : 3000 ms(Max) | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | 230VAC/ 766 ms<br>115VAC/ 1502 ms                               | P       |
| 7  | RISE TIME                   | 230VAC : 50 ms (Max)<br>115VAC : 50 ms (Max)    | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | 230VAC/ 12 ms<br>115VAC/ 12 ms                                  | P       |
| 8  | HOLD UP TIME                | 230VAC : 8 ms (TYP)<br>115VAC : 8 ms (TYP)      | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | 230VAC/ 21 ms<br>115VAC/ 20 ms                                  | P       |
| 9  | OVER/UNDERSHOOT TEST        | < ±5%   | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | TEST : 1.1 %  | P       |
| 10 | DYNAMIC LOAD                | V1 : 2700 mVp-p                                 | I/P : 230 VAC<br>(1).O/P : FULL /Min LOAD 90%DUTY/<br>1KHZ<br>(2).O/P : FULL /Min LOAD 90%DUTY/<br>3KHZ<br>(3).O/P : FULL /Min LOAD 90%DUTY/<br>5KHZ<br>(4).O/P : FULL /Min LOAD 50%DUTY/<br>120HZ<br>Ta : 25°C | (1)930 mVp-p<br>(2)1620 mVp-p<br>(3)1030 mVp-p<br>(4)1130 mVp-p | P       |

## INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                  | TEST CONDITION   | RESULT                          | VERDICT |
|----|-----------------------|--------------------------------|--|---------------------------------|---------|
| 1  | INPUT VOLTAGE RANGE   | 100VAC~264 VAC                 | I/P : TESTING<br>O/P : FULL LOAD<br>Ta : 25°C  | 61V~264V                        | P       |
|    |                       |                                | I/P :<br>LOW-LINE -3V= 97 V<br>HIGH-LINE+15%=300 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 : 100 VAC ~ 264 VAC<br>O/P : FULL -MIN LOAD<br>Ta : 25°C   | TEST : OK                       | P       |
| 3  | POWER FACTOR          | 0.95 / 230 VAC(TYP)            | I/P : 230 VAC  | PF= 0.984 / 230 VAC             | P       |
|    |                       | 0.98 / 115 VAC(TYP)            | I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | PF= 0.997 / 115 VAC             |         |
| 4  | EFFICIENCY            | 89 % (TYP)                     | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | 89.4 %                          | P       |
| 5  | INPUT CURRENT         | 230V/ 2 A (TYP)                | I/P : 230 VAC  | I = 1.69 A/ 230 VAC             | P       |
|    |                       | 115V/ 4 A (TYP)                | I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | I = 3.24 A/ 115 VAC             |         |
| 6  | INRUSH CURRENT        | 230V/ 40 A (TYP)               | I/P : 230 VAC  | I = 30 A/ 230 VAC               | P       |
|    |                       | 115V/ 20 A (TYP)<br>COLD START | I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | I = 15 A/ 115 VAC               |         |
| 7  | LEAKAGE CURRENT       | < 1 mA / 240 VAC               | I/P : 264 VAC<br>O/P : Min LOAD<br>Ta : 25°C   | L-FG : 0.7 mA<br>N-FG : 0.68 mA | P       |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                                 | TEST CONDITION  | RESULT  | VERDICT |
|----|-----------------------------|---|---|---|---------|
| 1  | OVER LOAD PROTECTION        | 105 % ~ 135 %                                 | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : TESTING<br>Ta : 25°C  | 120.1%/ 230 VAC<br>120.1%/ 115 VAC<br>Hiccup Mode   | P       |
| 2  | OVER VOLTAGE PROTECTION     | CH1 : 32.9V ~ 38.3V                           | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C | 35.5V/ 230 VAC<br>35.4V/ 115 VAC<br>Shut down Re- power ON                                  | P       |
| 3  | OVER TEMPERATURE PROTECTION | SPEC :<br>TSW1 : 85 ± 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 , recovers automatically after temperature goes down | P       |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE        | I/P : 264 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                 | NO DAMAGE<br>Hiccup Mode  | 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 | Q3 Rated :<br>STP14NM50N 12A/500V  | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C  | (1) 425 V<br>(2) 445 V<br>(3) 425 V   | P       |
| 2  | Diode Peak Voltage                                     | Q102 Rated :<br>MBR20150CT 20A/150V<br><br>Q104 Rated :<br>MBR20150CT 20A/150V | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br><br>(1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br>Ta : 25°C | (1) 128.3 V<br>(2) 109.9 V<br>(3) 125.9 V<br><br>(1) 109.9 V<br>(2) 93.8 V<br>(3) 112.3 V | P       |
| 3  | Input Capacitor Voltage                                | C 5 Rated :<br>180u/400V 105°C 18*40 KMG<br>(SURGE VOLTAGE 450V)               | I/P : High-Line +3V = 267 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) 392 V<br>(2) 384 V<br>(3) 417 V   | P       |
| 4  | Control IC Voltage Test                                | U 1 Rated :<br>PWM FAN4800AUN<br>12V~30V                                       | I/P : High-Line +3V = 267 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) 19.7 V<br>(2) 19.3 V<br>(3) 18.5 V  | P       |
| 5  | Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q 2 Rated :<br>STP19NM50N 13A/500V   | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C  | (1) 401 V<br>(2) 392 V<br>(3) 405 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 KVAC/min<br>I/P-FG : 2 KVAC/min<br>O/P-FG : 0.5 KVAC/min     | I/P-O/P : 3.6 KVAC/min<br>I/P-FG : 2.4 KVAC/min<br>O/P-FG : 0.6 KVAC/min<br>Ta : 25°C | I/P-O/P : 5.85 mA<br>I/P-FG : 5.21 mA<br>O/P-FG : 8.58 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°C / 70%RH        | I/P-O/P : 30 GΩ<br>I/P-FG : 30 GΩ<br>O/P-FG : 30 GΩ<br>NO DAMAGE       | P       |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                                   | 40 A / 2min<br>Ta : 25°C / 70%RH  | 2 mΩ   | P       |

### E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION   | TEST CONDITION   | RESULT                        | VERDICT |
|----|---|---|--|-------------------------------|---------|
| 1  | HARMONIC                                    | EN61000-3-2<br>CLASS A<br>CLASS D                           | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | PASS                          | P       |
| 2  | CONDUCTION                                  | EN55022<br>CLASS B  | I/P : 230 VAC (50HZ)<br>O/P : FULL/50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab | P       |
| 3  | RADIATION                                   | EN55022<br>CLASS B  | 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 A                    | P       |
| 6  | SURGE                                       | IEC61000-4-5<br>LIGHT INDUSTRY<br>L-N : 1KV<br>L,N-PE : 2KV | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    | 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 : RSP-320-24<br>1. ROOM AMBIENT BURN-IN : 15 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta= 31.9 °C<br>2. HIGH AMBIENT BURN-IN : 7 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=49.5 °C  |  |                            | P       |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
|    |   | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>PART NUMBER</th> <th>ROOM AMBIENT<br/>Ta=31.9 °C</th> <th>HIGH AMBIENT<br/>Ta=49.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>TR1021</td><td>43.3°C</td><td>63.5°C</td></tr> <tr><td>2</td><td>C10</td><td>105/450V 10% P=15 B32672P4</td><td>40.9°C</td><td>61.0°C</td></tr> <tr><td>3</td><td>BD1</td><td>10A/800V GLASS KBJ1008G</td><td>46.1°C</td><td>65.9°C</td></tr> <tr><td>4</td><td>D1</td><td>STTH8S06D 8A/600V TO220</td><td>48.2°C</td><td>67.7°C</td></tr> <tr><td>5</td><td>Q2</td><td>STP19NM50N 13A/500V TO220</td><td>42.1°C</td><td>62.7°C</td></tr> <tr><td>6</td><td>Q3</td><td>STP14NM50N 12A/500V TO220</td><td>43.1°C</td><td>64.4°C</td></tr> <tr><td>7</td><td>C5</td><td>180u/400V 105°C 18*40 KMG</td><td>35.1°C</td><td>55.7°C</td></tr> <tr><td>8</td><td>L1</td><td>TR1022</td><td>44.6°C</td><td>65.3°C</td></tr> <tr><td>9</td><td>U1</td><td>FAN4800AUN</td><td>36.3°C</td><td>56.4°C</td></tr> <tr><td>10</td><td>T2</td><td>TR1048</td><td>34.0°C</td><td>55.1°C</td></tr> <tr><td>11</td><td>C18</td><td>47u/50V L5Kh 6.3*11 YXF</td><td>37.1°C</td><td>57.3°C</td></tr> <tr><td>12</td><td>T1 COIL</td><td>TF2438</td><td>51.9°C</td><td>71.6°C</td></tr> <tr><td>13</td><td>TSW1</td><td></td><td>44.1°C</td><td>64.2°C</td></tr> <tr><td>14</td><td>RTH2</td><td>5KΩ 5Φ TDC05C20J 5%</td><td>41.0°C</td><td>60.8°C</td></tr> <tr><td>15</td><td>Q201</td><td>TIP122 5A/100V TO220</td><td>48.2°C</td><td>66.7°C</td></tr> <tr><td>16</td><td>Q101</td><td>STPS20120CT 20A/120V TO220</td><td>54.0°C</td><td>73.9°C</td></tr> <tr><td>17</td><td>Q104</td><td>STPS20120CT 20A/120V TO220</td><td>44.8°C</td><td>64.3°C</td></tr> <tr><td>18</td><td>L100</td><td>TR1064</td><td>59.0°C</td><td>80.1°C</td></tr> <tr><td>19</td><td>C105</td><td>1000u/35V UL10Kh 12.5*20 ZLH</td><td>51.2°C</td><td>71.5°C</td></tr> <tr><td>20</td><td>C203</td><td>100u/25V L5Kh 6.3*11 KY</td><td>39.2°C</td><td>59.3°C</td></tr> </tbody> </table> | NO   | Position                   |         | PART NUMBER | ROOM AMBIENT<br>Ta=31.9 °C | HIGH AMBIENT<br>Ta=49.5 °C | 1 | LF1 | TR1021 | 43.3°C | 63.5°C | 2 | C10 | 105/450V 10% P=15 B32672P4 | 40.9°C | 61.0°C | 3 | BD1 | 10A/800V GLASS KBJ1008G | 46.1°C | 65.9°C | 4 | D1 | STTH8S06D 8A/600V TO220 | 48.2°C | 67.7°C | 5 | Q2 | STP19NM50N 13A/500V TO220 | 42.1°C | 62.7°C | 6 | Q3 | STP14NM50N 12A/500V TO220 | 43.1°C | 64.4°C | 7 | C5 | 180u/400V 105°C 18*40 KMG | 35.1°C | 55.7°C | 8 | L1 | TR1022 | 44.6°C | 65.3°C | 9 | U1 | FAN4800AUN | 36.3°C | 56.4°C | 10 | T2 | TR1048 | 34.0°C | 55.1°C | 11 | C18 | 47u/50V L5Kh 6.3*11 YXF | 37.1°C | 57.3°C | 12 | T1 COIL | TF2438 | 51.9°C | 71.6°C | 13 | TSW1 |  | 44.1°C | 64.2°C | 14 | RTH2 | 5KΩ 5Φ TDC05C20J 5% | 41.0°C | 60.8°C | 15 | Q201 | TIP122 5A/100V TO220 | 48.2°C | 66.7°C | 16 | Q101 | STPS20120CT 20A/120V TO220 | 54.0°C | 73.9°C | 17 | Q104 | STPS20120CT 20A/120V TO220 | 44.8°C | 64.3°C | 18 | L100 | TR1064 | 59.0°C | 80.1°C | 19 | C105 | 1000u/35V UL10Kh 12.5*20 ZLH | 51.2°C | 71.5°C | 20 | C203 | 100u/25V L5Kh 6.3*11 KY | 39.2°C | 59.3°C |  |  |
| NO | Position  | PART NUMBER   | ROOM AMBIENT<br>Ta=31.9 °C   | HIGH AMBIENT<br>Ta=49.5 °C |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 1  | LF1   | TR1021  | 43.3°C   | 63.5°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 2  | C10   | 105/450V 10% P=15 B32672P4  | 40.9°C   | 61.0°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 3  | BD1   | 10A/800V GLASS KBJ1008G   | 46.1°C   | 65.9°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 4  | D1  | STTH8S06D 8A/600V TO220   | 48.2°C   | 67.7°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 5  | Q2  | STP19NM50N 13A/500V TO220   | 42.1°C   | 62.7°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 6  | Q3  | STP14NM50N 12A/500V TO220   | 43.1°C   | 64.4°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 7  | C5  | 180u/400V 105°C 18*40 KMG   | 35.1°C   | 55.7°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 8  | L1  | TR1022  | 44.6°C   | 65.3°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 9  | U1  | FAN4800AUN  | 36.3°C   | 56.4°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 10 | T2  | TR1048  | 34.0°C   | 55.1°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 11 | C18   | 47u/50V L5Kh 6.3*11 YXF   | 37.1°C   | 57.3°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 12 | T1 COIL   | TF2438  | 51.9°C   | 71.6°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 13 | TSW1  |   | 44.1°C   | 64.2°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 14 | RTH2  | 5KΩ 5Φ TDC05C20J 5%   | 41.0°C   | 60.8°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 15 | Q201  | TIP122 5A/100V TO220  | 48.2°C   | 66.7°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 16 | Q101  | STPS20120CT 20A/120V TO220  | 54.0°C   | 73.9°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 17 | Q104  | STPS20120CT 20A/120V TO220  | 44.8°C   | 64.3°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 18 | L100  | TR1064  | 59.0°C   | 80.1°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 19 | C105  | 1000u/35V UL10Kh 12.5*20 ZLH  | 51.2°C   | 71.5°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 20 | C203  | 100u/25V L5Kh 6.3*11 KY   | 39.2°C   | 59.3°C                     |         |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 2  | OVER LOAD BURN-IN TEST  | NO DAMAGE<br>1 HOUR ( MIN )   | I/P : 230 VAC<br>O/P : 118 % LOAD<br>Ta : 25°C                     | TEST : OK                  | P       |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR  | I/P : 264VAC/100VAC<br>O/P : 100 % LOAD<br>Ta= -35 °C              | TEST : OK                  | P       |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 4  | 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 : 272 VAC<br>O/P : FULL LOAD<br>Ta= 50 °C<br>HUMIDITY= 95 %R.H | TEST : OK                  | P       |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |
| 5  | TEMPERATURE<br>COEFFICIENT  | ± 0.03 %/°C (0-50°C)  | I/P : 230 VAC<br>O/P : FULL LOAD                                   | ± 0.003 %/°C (0-50°C)      | P       |             |                            |                            |   |     |        |        |        |   |     |                            |        |        |   |     |                         |        |        |   |    |                         |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |                           |        |        |   |    |        |        |        |   |    |            |        |        |    |    |        |        |        |    |     |                         |        |        |    |         |        |        |        |    |      |  |        |        |    |      |                     |        |        |    |      |                      |        |        |    |      |                            |        |        |    |      |                            |        |        |    |      |        |        |        |    |      |                              |        |        |    |      |                         |        |        |  |  |

|    |                             |  |  |   |
|----|-----------------------------|--|--|---|
| 6  | STORAGE TEMPERATURE TEST    | 1. Thermal shock Temperature : -45°C~ +90°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 |
| 7  | 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/Full Load AC ON/OFF TEST<br>turn on 58sec ; turn off 2sec | OK   | P |
| 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 : 60min in each axis (X.Y.Z)<br>(6) Ta : 25°C   | TEST : OK  | P |
| 9  | CAPACITOR LIFE CYCLE        | RSP-320-24: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<br>(4) I/P : 230VAC O/P : 50% LOAD Ta=50 °C LIFE TIME | (1) 814893HRS<br>(2) 119480HRS<br>(3) 195414HRS<br>(4) 238961HRS | P |
| 10 | MTBF                        | MIL-HDBK-217F NOTICE S2 PARTS COUNT<br>TOTAL FAILURE RATE : 206.5 KHRS   |  | P |
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 50°C  |  | P |

| DATE      | SAMPLE         | TEST RESULT | TESTER     | APPROVAL      |
|-----------|----------------|-------------|------------|---------------|
| 2012/8/7  | RD SAMPLE      | PASS        | SANFORD SU | VINCENT TSENG |
| 2012/8/27 | PRODUCT SAMPLE | PASS        | SANFORD SU | VINCENT TSENG |

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