



# Test Report: GST120A48-R7B

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120W AC-DC Reliable Green Industrial Adaptor

## ■ 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(Max)              | V1:200mVp-p                    | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C   | V1: 38.2mVp-p                                | P       |
| 3  | OUTPUT VOLTAGE(Max)<br>TOLERANCE | V1: -2.5%~ 2.5%                | I/P: 85VAC /264VAC<br>O/P:FULL/ MIN. LOAD<br>Ta:25°C   | V1: -0.183%~0.183%                           | P       |
| 4  | LINE REGULATION (Max)            | V1: -1%~ 1%                    | I/P: 85VAC~ 264VAC<br>O/P:FULL LOAD<br>Ta:25°C   | V1: 0%~ 0.013%                               | P       |
| 5  | LOAD REGULATION(Max)             | V1: -2.5%~ 2.5%                | I/P: 230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C   | V1: -0.183%~0.183%                           | P       |
| 6  | SET UP TIME(Max)                 | 230VAC/2000ms<br>115VAC/2500ms | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | 230VAC/ 352.870ms<br>115VAC/ 554.011ms       | P       |
| 7  | RISE TIME (Max)                  | 230VAC/30ms<br>115VAC/30ms     | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | 230VAC/ 26.227ms<br>115VAC/ 26.872ms         | P       |
| 8  | HOLD UP TIME(Typ)                | 230VAC/20ms<br>115VAC/20ms     | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | 230VAC/ 42.201ms<br>115VAC/ 27.877ms         | P       |
| 9  | OVER/UNDERSHOOT TEST             | < ±5%                          | I/P: 230VAC<br>O/P:FULL LOAD<br>Ta:25°C  | < ±5%  | P       |
| 10 | DYNAMIC LOAD                     | V1: 4800mVp-p                  | I/P: 230VAC<br>O/P(1)FULL /Min LOAD<br>90%DUTY / 1KHZ<br>(2) (1)FULL /Min LOAD<br>90%DUTY / 3KHZ<br>(3)FULL /Min LOAD<br>90%DUTY / 5KHZ<br>(4)FULL /Min LOAD<br>50%DUTY / 120HZ<br>Ta:25°C | 676mVp-p<br>538mVp-p<br>628mVp-p<br>884mVp-p | P       |

**INPUT FUNCTION TEST**

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------|---------------|----------------|--------|---------|
|----|-----------|---------------|----------------|--------|---------|

|   |                       |  |   |  |   |
|---|-----------------------|--|---|--|---|
| 1 | INPUT VOLTAGE RANGE   | 85VAC~264VAC<br>120VDC~370VDC          | (1) I/P:TESTING<br>O/P:FULL LOAD<br>(2) I/P:DC TESTING(L:+ N:-)<br>O/P: FULL / 50% LOAD<br>(3) I/P:DC TESTING(L:- N:+)<br>O/P: FULL / 50% LOAD<br>Ta:25°C   | (1) 65.193V~264V<br>(2) 112.7Vdc~370Vdc/FULL LOAD<br>112.7Vdc~370Vdc/50% LOAD<br>(3) 112.7Vdc~370Vdc/FULL LOAD<br>112.7Vdc~370Vdc/50% LOAD | P |
|   |                       |  | I/P:<br>(1)LOW-LINE-3V=82 V<br>HIGH-LINE+15%=300 V<br>O/P:FULL/MIN LOAD<br>ON: 30 Sec OFF: 30 Sec 10MIN<br>(2)230Vac<br>ON: 0.5 Sec OFF: 0.5 Sec 20MIN<br>(3)230Vac<br>ON:3Sec OFF:3Sec 12HOURS<br>( POWER ON/OFF NO DAMAGE ) | TEST:OK  |   |
| 2 | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE               | I/P:85 VAC ~264 VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C   | TEST: OK   | P |
| 3 | POWER FACTOR(TYP)     | 0.93/ 230VAC<br>0.97/115VAC            | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | PF= 0.945/230VAC<br>PF=0.988 /115VAC   | P |
| 4 | EFFICIENCY(TYP)       | 91%                                    | I/P:230 VAC<br>O/P:FULL LOAD<br>Ta:25°C   | 91.58%   | P |
| 5 | INPUT CURRENT (Typ)   | 230V/ 0.7A<br>115V/ 1.4A               | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | I = 0.593A/ 230VAC<br>I = 1.142A/ 115VAC   | P |
| 6 | INRUSH CURRENT(Typ)   | 230VAC/70A<br>115VAC/35A<br>COLD START | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | I = 44.695A/ 230VAC<br>I = 23.133A/ 115VAC   | P |
| 7 | LEAKAGE CURRENT       | < 0.75 mA / 240 VAC                    | I/P : 240 VAC<br>O/P : Min LOAD<br>Ta : 25°C  | L-FG : 0.421mA<br>N-FG : 0.421mA   | P |
| 8 | NO LOAD CONSUMPTION   | < 0.15 W                               | I/P : 115VAC<br>I/P : 230VAC<br>O/P : NO LOAD<br>Ta : 25°C  | < 0.0560W<br>< 0.0858W   | P |

**PROTECTION FUNCTION TEST**

| NO | TEST ITEM                   | SPECIFICATION                          | TEST CONDITION   | RESULT  | VERDICT |
|----|-----------------------------|--|--|---|---------|
| 1  | OVER LOAD PROTECTION        | 105%~ 160%                             | I/P: 230VAC<br>I/P: 115VAC<br>O/P: TESTING<br>Ta:25°C  | 136.4%/ 230VAC<br>128.8%/115VAC<br>Protection type : Hiccup mode,<br>recovers automatically after fault<br>condition is removed | P       |
| 2  | OVER VOLTAGE PROTECTION     | CH:50.4V~64.8V                         | I/P: 230VAC<br>I/P: 115VAC<br>O/P: MIN LOAD<br>Ta:25°C | 58.0V/ 230VAC<br>58.4V/ 115VAC<br>Protection type : Shut down o/p<br>voltage, re-power on to recover                            | P       |
| 3  | OVER TEMPERATURE PROTECTION | NO DAMAGE                              | I/P: 230 VAC<br>O/P: FULL LOAD                         | O.T.P. Active<br>Shut down o/p voltage, re-power<br>on to recover   | P       |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 264VAC<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  | PWM Transistor<br>( D to S) or (C to E) Peak Voltage   | Q32 Rated<br>11A/700V          | I/P: High-Line +3V =267V<br>AC ON/OFF<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) Full Load Continue<br>Ta:25°C   | (1) 588V<br>(2) 450V<br>(3) 600V                      | P       |
| 2  | Diode Peak Voltage                                     | Q102 Rated<br>20A/300V         | I/P: High-Line +3V =267 V<br>AC ON/OFF<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(4) Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>Ta:25°C | Q101:<br>(1) 250V<br>(2) 240V<br>(3) 262V<br>(4) 267V | P       |
| 3  | Input Capacitor Voltage                                | C5 Rated:<br>: 120u/420V 105°C | I/P: High-Line +3V =267 V<br>O/P: (1) Full Load input on/off<br>(2) Min load input on /Off<br>(3) Full Load /Min load Change<br>Ta:25°C  | (1) 405V<br>(2) 413V<br>(3) 407V                      | P       |
| 4  | Control IC Voltage Test                                | PWM IC U1 Rated<br>28 V        | I/P: High-Line +3V =267 V<br>AC ON/OFF<br>O/P: (1) FULL LOAD<br>(2) Output Short<br>(3) NO LOAD VR MIN LOW LINE<br>Ta:25°C   | (1) 21.4V<br>(2) 15.2V<br>(3) 20.1V                   | P       |
| 6  | P.F.C Transistor<br>( D to S) or (C to E) Peak Voltage | Q31 Rated<br>15.8A/600V        | I/P: High-Line +3V =267 V<br>AC ON/OFF<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) Full Load Continue<br>Ta:25°C  | (1) 460V<br>(2) 432V<br>(3) 460V                      | P       |

|   |                          |                      |   |                                  |   |
|---|--------------------------|----------------------|---|----------------------------------|---|
| 7 | P.F.C DIODE              | D1 Rated<br>9A/600V  | I/P:High-Line +3V =267 V<br>AC ON/OFF<br>O/P: (1)Full Load<br>(2)Output Short<br>(3)Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>Ta:25°C | (1) 436V<br>(2) 414V<br>(3) 438V | P |
| 8 | Clamp Diode Peak Voltage | D30 Rated : 800V/ 3A | I/P : High-Line +3V = 267 V<br>AC ON/OFF<br>O/P : (1) Dynamic Load<br>90%Duty/1KHz<br>(2)Full load continue<br>Ta : 25°C                          | (1) 556 V<br>(2) 558 V           | P |

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION        | TEST CONDITION                   | RESULT                        | VERDICT |
|----|----------------------|----------------------|----------------------------------|-------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 3KVAC/min   | I/P-O/P: 3.6 KVAC/min<br>Ta:25°C | I/P-O/P: 3.219mA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ | I/P-O/P: 500 VDC<br>Ta:25°C      | I/P-O/P: 9999MΩ<br>NO DAMAGE  | P       |

### E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION   | TEST CONDITION   | RESULT                        | VERDICT |
|----|---|---|--|-------------------------------|---------|
| 1  | HARMONIC                                    | BS EN/EN61000-3-2,GB9254<br>CLASS A   | I/P:230VAC/50HZ<br>O/P:100%,75%,50%OAD<br>Ta:25°C        | PASS                          | P       |
| 2  | CONDUCTION                                  | BS EN/EN55032(CISPR32),<br>FCC PART 15 / CISPR22 CAN<br>ICES-3(B)/NMB-3(B),CNS13438,GB17625.1<br>EAC TP TC 020,MSIP KN32<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                                   | BS EN/EN55032(CISPR32),<br>FCC PART 15 / CISPR22 CAN<br>ICES-3(B)/NMB-3(B),CNS13438,GB17625.1<br>EAC TP TC 020,MSIP KN32<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                                       | BS EN/EN61000-4-2<br>LIGHT INDUSTRY<br>AIR : 15KV / Contact : 8KV   | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    | P       |
| 5  | E.F.T                                       | BS EN/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                                       | BS EN/EN61000-4-5<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 : GST120A24-R7B<br>1. ROOM AMBIENT BURN-IN : 2 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=24.7°C<br>2. HIGH AMBIENT BURN-IN : 2 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=44.4 °C                                      | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT<br/>Ta=24.7°C</th> <th>HIGH AMBIENT<br/>Ta=44.4°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>ZNR1</td><td>61.5°C</td><td>77.1°C</td></tr> <tr><td>2</td><td>RTH30</td><td>68.1°C</td><td>85.0°C</td></tr> <tr><td>3</td><td>LF2</td><td>62.1°C</td><td>79.0°C</td></tr> <tr><td>4</td><td>L1</td><td>62.8°C</td><td>79.5°C</td></tr> <tr><td>5</td><td>L2</td><td>64.2°C</td><td>81.1°C</td></tr> <tr><td>6</td><td>D6</td><td>65.4°C</td><td>81.9°C</td></tr> <tr><td>7</td><td>D30</td><td>75.9°C</td><td>92.2°C</td></tr> <tr><td>8</td><td>C5</td><td>67.1°C</td><td>83.1°C</td></tr> <tr><td>9</td><td>C52</td><td>74.6°C</td><td>90.9°C</td></tr> <tr><td>10</td><td>T1</td><td>85.0°C</td><td>101.5°C</td></tr> <tr><td>11</td><td>BD1</td><td>64.1°C</td><td>80.5°C</td></tr> <tr><td>12</td><td>D1</td><td>65.1°C</td><td>81.6°C</td></tr> <tr><td>13</td><td>Q31</td><td>65.2°C</td><td>82.0°C</td></tr> <tr><td>14</td><td>Q32</td><td>66.7°C</td><td>83.5°C</td></tr> <tr><td>15</td><td>Q102</td><td>69.3°C</td><td>86.1°C</td></tr> <tr><td>16</td><td>C110</td><td>69.0°C</td><td>85.5°C</td></tr> <tr><td>17</td><td>LF1</td><td>62.8°C</td><td>78.7°C</td></tr> <tr><td>18</td><td>U2</td><td>71.2°C</td><td>85.9°C</td></tr> <tr><td>19</td><td>D33</td><td>82.1°C</td><td>100.6°C</td></tr> <tr><td>20</td><td>CASE</td><td>53.5°C</td><td>70.3°C</td></tr> </tbody> </table> | NO                   | Position | ROOM AMBIENT<br>Ta=24.7°C | HIGH AMBIENT<br>Ta=44.4°C | 1 | ZNR1 | 61.5°C | 77.1°C | 2 | RTH30 | 68.1°C | 85.0°C | 3 | LF2 | 62.1°C | 79.0°C | 4 | L1 | 62.8°C | 79.5°C | 5 | L2 | 64.2°C | 81.1°C | 6 | D6 | 65.4°C | 81.9°C | 7 | D30 | 75.9°C | 92.2°C | 8 | C5 | 67.1°C | 83.1°C | 9 | C52 | 74.6°C | 90.9°C | 10 | T1 | 85.0°C | 101.5°C | 11 | BD1 | 64.1°C | 80.5°C | 12 | D1 | 65.1°C | 81.6°C | 13 | Q31 | 65.2°C | 82.0°C | 14 | Q32 | 66.7°C | 83.5°C | 15 | Q102 | 69.3°C | 86.1°C | 16 | C110 | 69.0°C | 85.5°C | 17 | LF1 | 62.8°C | 78.7°C | 18 | U2 | 71.2°C | 85.9°C | 19 | D33 | 82.1°C | 100.6°C | 20 | CASE | 53.5°C | 70.3°C |  | P |
| NO | Position  | ROOM AMBIENT<br>Ta=24.7°C   | HIGH AMBIENT<br>Ta=44.4°C  |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 1  | ZNR1  | 61.5°C  | 77.1°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 2  | RTH30   | 68.1°C  | 85.0°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 3  | LF2   | 62.1°C  | 79.0°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 4  | L1  | 62.8°C  | 79.5°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 5  | L2  | 64.2°C  | 81.1°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 6  | D6  | 65.4°C  | 81.9°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 7  | D30   | 75.9°C  | 92.2°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 8  | C5  | 67.1°C  | 83.1°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 9  | C52   | 74.6°C  | 90.9°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 10 | T1  | 85.0°C  | 101.5°C  |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 11 | BD1   | 64.1°C  | 80.5°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 12 | D1  | 65.1°C  | 81.6°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 13 | Q31   | 65.2°C  | 82.0°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 14 | Q32   | 66.7°C  | 83.5°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 15 | Q102  | 69.3°C  | 86.1°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 16 | C110  | 69.0°C  | 85.5°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 17 | LF1   | 62.8°C  | 78.7°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 18 | U2  | 71.2°C  | 85.9°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 19 | D33   | 82.1°C  | 100.6°C  |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 20 | CASE  | 53.5°C  | 70.3°C   |                      |          |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 2  | OVER LOAD BURN-IN TEST  | NO DAMAGE<br>1 HOUR ( MIN )   | I/P : 230 VAC<br>O/P : 136% 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= -30 °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>CONTROL45°C<br>NO DAMAGE   | I/P : 272 VAC<br>O/P : FULL LOAD<br>Ta= 45 °C<br>HUMIDITY= 95 %R.H   | TEST : OK            | P        |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 5  | TEMPERATURE<br>COEFFICIENT  | ± 0.03 %/°C (0~45°C)  | I/P : 230 VAC<br>O/P : FULL LOAD   | ± 0.009%/°C (0~45°C) | P        |                           |                           |   |      |        |        |   |       |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |     |        |        |    |    |        |         |    |     |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |     |        |         |    |      |        |        |  |   |
| 6  | STORAGE TEMPERATURE TEST  | 1. Thermal shock Temperature : -40°C~ +85°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 : -30°C~ +70°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        | SUPPOSE C110 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=45°C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta=45°C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta=45°C LIFE TIME                | (1) 145886HRS<br>(2) 45558HRS<br>(3) 80925HRS<br>(4) 121817HRS | P  |
| 10 | MTBF                        | 2250.5K hrs min. Telcordia SR-332 (Bellcore) ; 368.5K hrs min. MIL-HDBK-217F (25°C)  |  | P  |
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C  |  | P- |

| TEST RESULT | TESTER | APPROVAL |
|-------------|--------|----------|
| PASS        | Frank  | Wangdz   |

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