



# Test Report: RSP-1600-48

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1600W Power Supply with Single Output

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

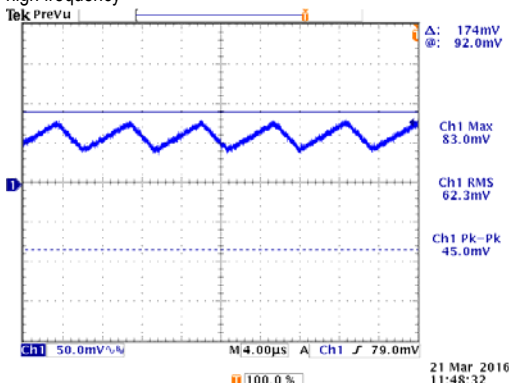
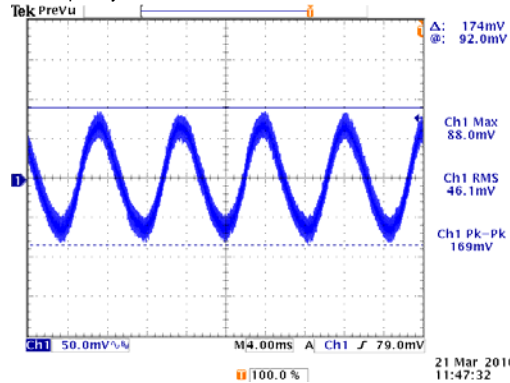
E.M.C. Test

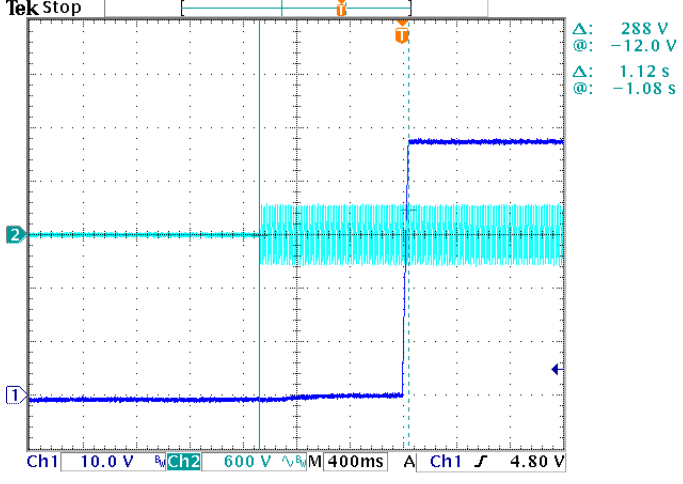
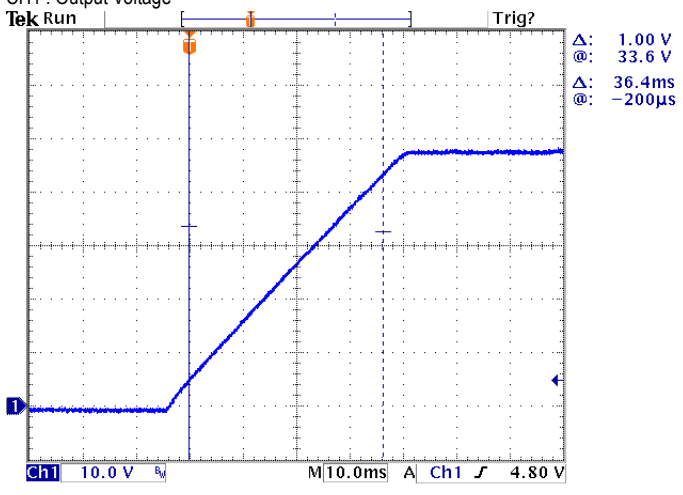
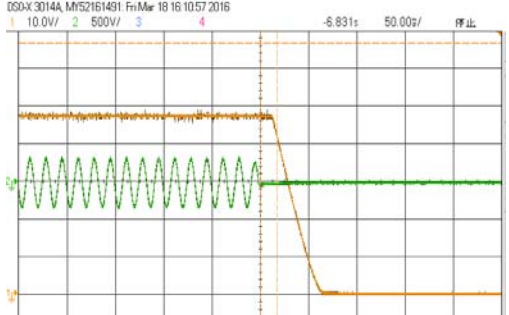
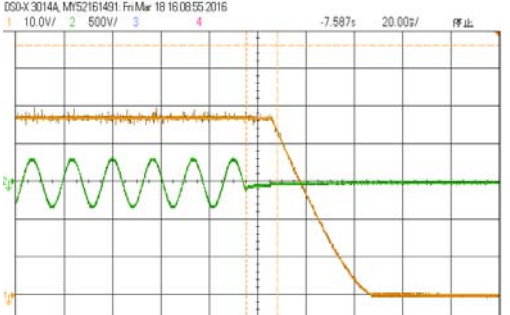
## ■ RELIABILITY TEST

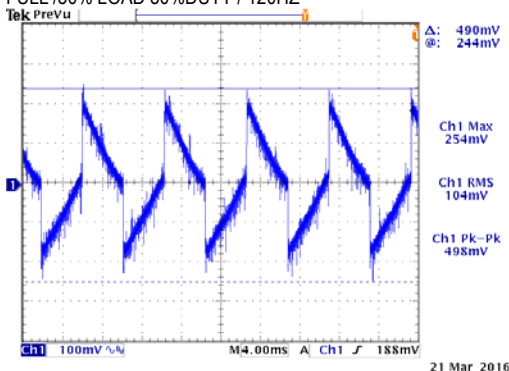
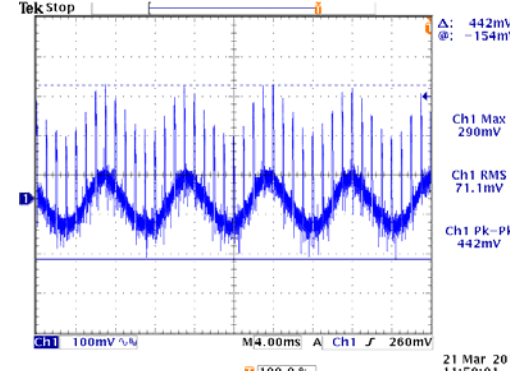
ENVIRONMENT TEST

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

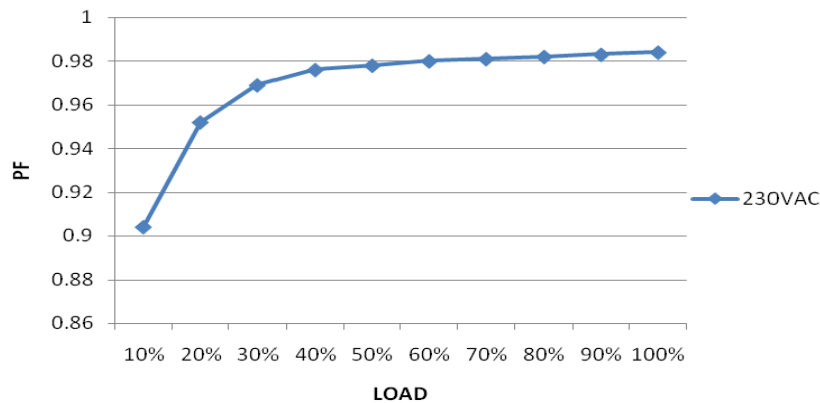
| NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TEST ITEM                        | SPECIFICATION      | TEST CONDITION                                                | RESULT                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------|---------------------------------------------------------------|--------------------------------------------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OUTPUT VOLTAGE<br>ADJUST RANGE   | CH1: 47.5 V~ 58.8V | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C | 45.62V~60.1V/230VAC<br>45.62V~60.1V/115VAC |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OUTPUT VOLTAGE(Max)<br>TOLERANCE | V1: 1 %~ -1 %      | I/P: 180VAC /264VAC<br>O/P:FULL/ MIN. LOAD<br>Ta:25°C         | V1: 0.2 %~ -0.2 %                          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LINE REGULATION (Max)            | V1: 0.5 %~ -0.5 %  | I/P: 180VAC~ 264VAC<br>O/P:FULL LOAD<br>Ta:25°C               | V1: 0.07 %~ -0.07 %                        |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LOAD REGULATION(Max)             | V1: 0.5 %~ -0.5 %  | I/P: 230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C                  | V1: 0.05 %~ -0.05 %                        |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OVER/UNDERSHOOT TEST             | < ±5%              | I/P: 230VAC<br>O/P:FULL LOAD<br>Ta:25°C                       | <5 %                                       |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | RIPPLE & NOISE(Max )             | V1: 300 mVp-p      | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C                        | V1: 169 mVp-p                              |
| <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>high frequency :</p>  <p>Ch1 Max 83.0mV<br/>Ch1 RMS 62.3mV<br/>Ch1 Pk-Pk 45.0mV</p> <p>21 Mar 2016 11:48:32</p> </div> <div style="text-align: center;"> <p>low frequency :</p>  <p>Ch1 Max 88.0mV<br/>Ch1 RMS 46.1mV<br/>Ch1 Pk-Pk 169mV</p> <p>21 Mar 2016 11:47:32</p> </div> </div> |                                  |                    |                                                               |                                            |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SET UP TIME(Max)                 | 230VAC/1500ms      | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                 | 230VAC/ 1120 ms                            |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1 : Output Voltage CH2 : AC Input Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                    |                                                               |                                            |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--|--|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <div>70.00 %</div> |  |  |  |
| <div>8</div> <div>RISE TIME (Max)</div> <div>230VAC/60ms</div> <div>           I/P : 230 VAC<br/>           O/P : FULL LOAD<br/>           Ta : 25°C         </div> <div>230VAC/ 36.4 ms</div> <div>           INPUT=230VAC/50HZ @ FULL LOAD<br/>           CH1 : Output Voltage         </div>                                                                                                                                                                                                                                                                                                                                                                                        | <div>30.00 %</div> |  |  |  |
| <div>9</div> <div>HOLD UP TIME (Typ.)</div> <div>           230VAC 75%/ 16ms<br/>           230VAC 100%/10ms         </div> <div>           I/P : 230 VAC<br/>           O/P : 75% LOAD<br/>           O/P : 100% LOAD<br/>           Ta : 25°C         </div> <div>           17 ms (75% load)<br/>           12.8ms (100% load)         </div> <div>           INPUT=230VAC/50HZ @ 75% LOAD<br/>           CH1 : Output Voltage CH2 : AC Input Voltage         </div>  <div>           INPUT=230VAC/50HZ @ FULL LOAD<br/>           CH1 : Output Voltage CH2 : AC Input Voltage         </div>  |                    |  |  |  |

|                                                                                                                                                                                                                                                                                        |              |                |                                                                                                         |                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------|---------------------------------------------------------------------------------------------------------|----------------------|
| 10                                                                                                                                                                                                                                                                                     | DYNAMIC LOAD | V1: 4800 mVp-p | I/P: 230VAC<br>O/P:<br>(1)FULL /50% LOAD 50%DUTY / 120HZ<br>(2)FULL /50% LOAD 50%DUTY / 1KHZ<br>Ta:25°C | 498mVp-p<br>442mVp-p |
| <div> <div> <p>FULL /50% LOAD 50%DUTY / 120HZ</p>  </div> <div> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  </div> </div> |              |                |                                                                                                         |                      |

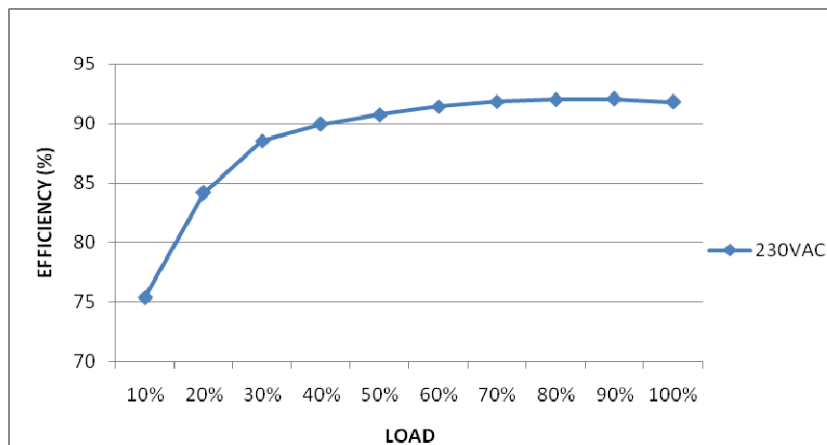
## INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION             | TEST CONDITION                                                                                                                                                                                                                                                    | RESULT                                 |
|----|-----------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 1  | INPUT VOLTAGE RANGE   | 90VAC~264VAC              | I/P: TESTING<br>O/P: FULL LOAD<br>Ta: 25°C                                                                                                                                                                                                                        | 150 V~264V                             |
|    |                       |                           | I/P:<br>(1)LOW-LINE-3V=87 V<br>HIGH-LINE+15%=300 V<br>O/P: FULL/MIN LOAD<br>(PLEASE CHECK DERATING CURVE)<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: 90 VAC ~264 VAC<br>O/P: FULL ~MIN LOAD<br>Ta: 25°C                                                                                                                                                                                                           | TEST: OK                               |
| 3  | INPUT CURRENT (Typ.)  | 230V/ 8.5 A<br>115V/ 15 A | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>(PLEASE CHECK DERATING CURVE)<br>Ta : 25°C                                                                                                                                                                   | I = 7.72A/ 230VAC<br>I = 12.7A/ 115VAC |
| 4  | LEAKAGE CURRENT       | <2 mA / 230 VAC           | I/P : 230 VAC<br>O/P : Min LOAD<br>Ta : 25°C                                                                                                                                                                                                                      | L-FG : 0.6 mA<br>N-FG : 0.6 mA         |
| 5  | POWER FACTOR (Typ.)   | 0.97 / 230VAC             | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                                                                                                                     | PF=0.978/230VAC                        |
|    | P.F vs LOAD           |                           |                                                                                                                                                                                                                                                                   |                                        |



|   |                  |     |                                         |       |
|---|------------------|-----|-----------------------------------------|-------|
| 6 | EFFICIENCY(Typ.) | 93% | I/P:230 VAC<br>O/P:FULL LOAD<br>Ta:25°C | 93.5% |
|---|------------------|-----|-----------------------------------------|-------|

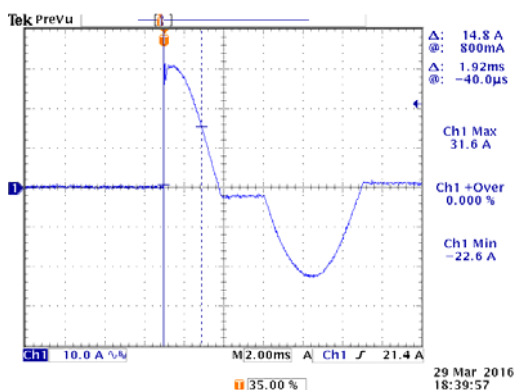
EFFICIENCY vs LOAD



|   |                      |                         |                                               |                                      |
|---|----------------------|-------------------------|-----------------------------------------------|--------------------------------------|
| 7 | INRUSH CURRENT(Typ.) | 230V/35 A<br>COLD START | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | I=31.6A/ 230VAC<br>T50= 1920 us/230V |
|---|----------------------|-------------------------|-----------------------------------------------|--------------------------------------|

INPUT=230VAC/50HZ @ FULL LOAD

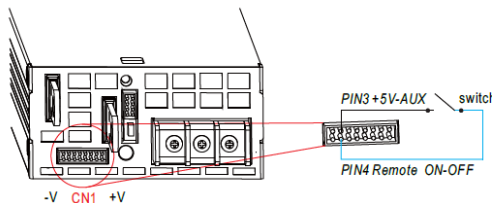
CH1 : Input current



## PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                                                                                                                                                 | TEST CONDITION                                                       | RESULT                                                                                                                                                                      |
|----|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | OVER LOAD PROTECTION        | 105 %~ 115 %<br><br>PROTECTION TYPE :<br>Constant current limiting, unit will shut down o/p voltage after 5 sec. re-power on to recover                       | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 180VAC<br>O/P: TESTING<br>Ta:25°C | 107.76%/ 264VAC<br>107.76%/ 230VAC<br>107.76%/180VAC<br>PROTECTION TYPE :<br>Constant current limiting, unit will shut down o/p voltage after 5 sec. re-power on to recover |
| 2  | OVER VOLTAGE PROTECTION     | 63 V~ 75 V<br><br>PROTECTION TYPE :<br>Shut down o/p voltage, re-power on to recover                                                                          | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 90VAC<br>O/P: MIN LOAD<br>Ta:25°C | 69V/ 264VAC<br>69V/ 230VAC<br>69V/ 90VAC<br>PROTECTION TYPE :<br>Shut down o/p voltage, re-power on to recover                                                              |
| 3  | OVER TEMPERATURE PROTECTION | NO DAMAGE<br><br>PROTECTION TYPE :<br>Shut down o/p voltage, recovers automatically after temperature goes down                                               | I/P: 264VAC<br>I/P: 90VAC<br>O/P: FULL LOAD                          | O.T.P. Active<br>PROTECTION TYPE :<br>Shut down o/p voltage, recovers automatically after temperature goes down                                                             |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE<br>PROTECTION TYPE :<br>Constant current limiting, unit will shut down o/p voltage after 5 sec. re-power on to recover | I/P: 264VAC<br>I/P: 90VAC<br>O/P: FULL LOAD<br>Ta:25°C               | NO DAMAGE<br>PROTECTION TYPE :<br>Constant current limiting, unit will shut down o/p voltage after 5 sec. re-power on to recover                                            |

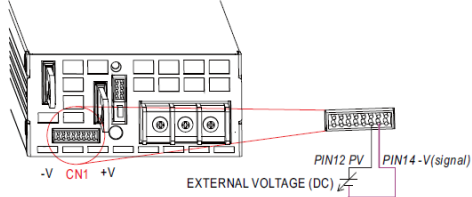
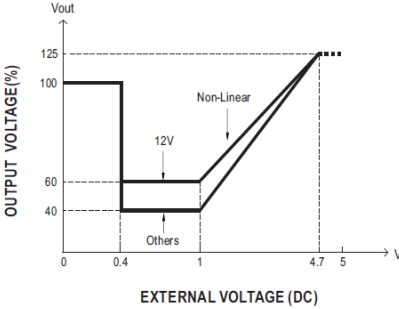
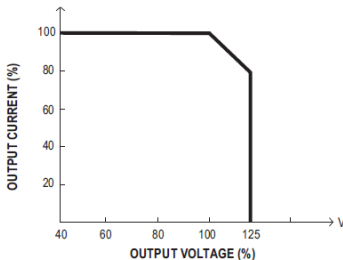
## CONTROL FUNCTION TEST

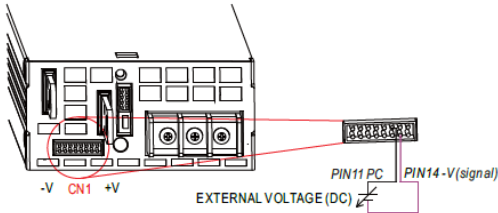
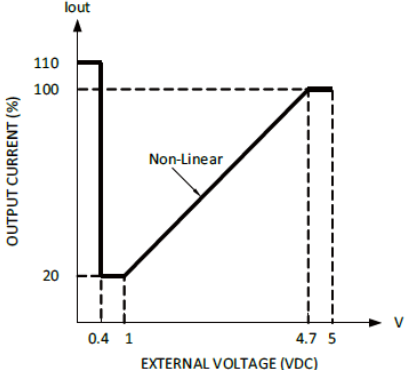
| NO                                | TEST ITEM             | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEST CONDITION                          | RESULT                                                              |                                   |                     |              |    |             |     |
|-----------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------|-----------------------------------|---------------------|--------------|----|-------------|-----|
| 1                                 | AUXILIARY POWER (AUX) | 1. 5V±10%@0.3A<br>ripple:150mVp-p<br><br>2. 12V±10%@0.8A<br>ripple:250mVp-p                                                                                                                                                                                                                                                                                                                                                                                       | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | 4.78 V 0.3A : ripple: 15.9mVp-p<br>11.16V 0.8 A : ripple: 100 mVp-p |                                   |                     |              |    |             |     |
| 2                                 | REMOTE ON/OFF CONTROL | ※ The power supply can be turned ON/OFF individually or along with other units by using the "Remote ON-OFF" function.<br> <p>I/P: 230 VAC<br/>O/P:FULL LOAD<br/>Ta:25℃<br/>Test Result :</p> <table><tr><td>Between Remote ON-OFF and +5V-AUX</td><td>Power Supply Status</td></tr><tr><td>Switch Short</td><td>ON</td></tr><tr><td>Switch Open</td><td>OFF</td></tr></table> |                                         |                                                                     | Between Remote ON-OFF and +5V-AUX | Power Supply Status | Switch Short | ON | Switch Open | OFF |
| Between Remote ON-OFF and +5V-AUX | Power Supply Status   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                         |                                                                     |                                   |                     |              |    |             |     |
| Switch Short                      | ON                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                         |                                                                     |                                   |                     |              |    |             |     |
| Switch Open                       | OFF                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                         |                                                                     |                                   |                     |              |    |             |     |
| 3                                 | REMOTE SENSE          | S+ / S-<br><br>>0.5V<br>Compensate voltage drop on the load wiring up to 0.5V.                                                                                                                                                                                                                                                                                                                                                                                    | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃ | > 0.5 V                                                             |                                   |                     |              |    |             |     |

|   |              |
|---|--------------|
| 4 | ALARM SIGNAL |
|---|--------------|

| 1.                  | DC OK SIGNAL<br>High (4.5 ~ 5.5V) : When the $V_{out} \leq 80\% \pm 5\%$ .<br>Low (-0.1 ~ 0.5V) : When $V_{out} \geq 80\% \pm 5\%$ .<br>The maximum sourcing current is 10mA and only for output.<br>I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃<br>Test Result : <table> <tr> <th>Vout</th><th>DC OK SIGNAL</th></tr> <tr> <td><math>V_{out} \leq 75\%</math></td><td>5.037 V</td></tr> <tr> <td><math>V_{out} \geq 85\%</math></td><td>-0.09V</td></tr> </table> | Vout         | DC OK SIGNAL | $V_{out} \leq 75\%$ | 5.037 V | $V_{out} \geq 85\%$ | -0.09V     |                 |    |          |              |         |        |        |                 |        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|---------------------|---------|---------------------|------------|-----------------|----|----------|--------------|---------|--------|--------|-----------------|--------|
| Vout                | DC OK SIGNAL                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| $V_{out} \leq 75\%$ | 5.037 V                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| $V_{out} \geq 85\%$ | -0.09V                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| 2.                  | T-ALARM <table> <tr> <th>P.S.U STATUS</th><th>Vo</th><th>T-ALARM</th></tr> <tr> <td>NORMAL</td><td>100%±2%</td><td>-0.1 ~0.5V</td></tr> <tr> <td>OTP OR FAN LOCK</td><td>0V</td><td>4.5~5.5V</td></tr> </table> I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃<br>Test Result : <table> <tr> <th>P.S.U STATUS</th><th>T-ALARM</th></tr> <tr> <td>NORMAL</td><td>-0.09V</td></tr> <tr> <td>OTP OR FAN LOCK</td><td>4.998V</td></tr> </table>                           | P.S.U STATUS | Vo           | T-ALARM             | NORMAL  | 100%±2%             | -0.1 ~0.5V | OTP OR FAN LOCK | 0V | 4.5~5.5V | P.S.U STATUS | T-ALARM | NORMAL | -0.09V | OTP OR FAN LOCK | 4.998V |
| P.S.U STATUS        | Vo                                                                                                                                                                                                                                                                                                                                                                                                                                                             | T-ALARM      |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| NORMAL              | 100%±2%                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -0.1 ~0.5V   |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| OTP OR FAN LOCK     | 0V                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4.5~5.5V     |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| P.S.U STATUS        | T-ALARM                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| NORMAL              | -0.09V                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |
| OTP OR FAN LOCK     | 4.998V                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |              |                     |         |                     |            |                 |    |          |              |         |        |        |                 |        |

|   |                                 |
|---|---------------------------------|
| 5 | OUTPUT VOLTAGE PROGRAMMABLE(PV) |
|---|---------------------------------|

| ※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed by applying EXTERNAL VOLTAGE.  <p>◎ For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.</p> <div>   <p>◎ The rated current should change with the Output Voltage Programming accordingly.<br/>           ◎ For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.</p> </div> I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃<br>Test Result : <table> <tr> <th>MODEL \ PV</th><th>&lt;0.4V</th><th>1V</th><th>4.7V</th><th>5V</th></tr> <tr> <td>SPEC</td><td>48V±5%</td><td>19.2V±5%</td><td>60V±5%</td><td>60V±5%</td></tr> <tr> <td>Vout</td><td>48.1V</td><td>19.21V</td><td>59.7V</td><td>61.01V</td></tr> </table> | MODEL \ PV | <0.4V    | 1V     | 4.7V   | 5V | SPEC | 48V±5% | 19.2V±5% | 60V±5% | 60V±5% | Vout | 48.1V | 19.21V | 59.7V | 61.01V |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|--------|--------|----|------|--------|----------|--------|--------|------|-------|--------|-------|--------|--|
| MODEL \ PV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <0.4V      | 1V       | 4.7V   | 5V     |    |      |        |          |        |        |      |       |        |       |        |  |
| SPEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 48V±5%     | 19.2V±5% | 60V±5% | 60V±5% |    |      |        |          |        |        |      |       |        |       |        |  |
| Vout                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 48.1V      | 19.21V   | 59.7V  | 61.01V |    |      |        |          |        |        |      |       |        |       |        |  |

|       |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                            |                                                                                                                                                                                                                                                                              |       |       |    |      |    |      |          |         |          |          |      |        |       |      |         |
|-------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|----|------|----|------|----------|---------|----------|----------|------|--------|-------|------|---------|
| 6     | OUTPUT CURRENT PROGRAMMABLE (PC) | <div data-bbox="496 277 995 488">  <p>EXTERNAL VOLTAGE (DC)</p> <p>PIN11 PC    PIN14 -V(signal)</p> </div> <div data-bbox="531 544 1088 564"> <p>© For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.</p> </div> <div data-bbox="1091 277 1497 645">  <p>OUTPUT CURRENT (%)</p> <p>EXTERNAL VOLTAGE (VDC)</p> <p>Non-Linear</p> </div> <div data-bbox="472 663 601 775"> <p>I/P: 230 VAC<br/>O/P: TESTING<br/>Ta: 25°C<br/>Test Result :</p> </div> <div data-bbox="472 817 1453 916"> <table> <tr> <td>ADJ V</td><td>&lt;0.4V</td><td>1V</td><td>4.7V</td><td>5V</td></tr> <tr> <td>SPEC</td><td>110%±10%</td><td>20%±10%</td><td>100%±10%</td><td>100%±10%</td></tr> <tr> <td>lout</td><td>107.6%</td><td>15.8%</td><td>100%</td><td>100.59%</td></tr> </table> </div> |                                                            |                                                                                                                                                                                                                                                                              | ADJ V | <0.4V | 1V | 4.7V | 5V | SPEC | 110%±10% | 20%±10% | 100%±10% | 100%±10% | lout | 107.6% | 15.8% | 100% | 100.59% |
| ADJ V | <0.4V                            | 1V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4.7V                                                       | 5V                                                                                                                                                                                                                                                                           |       |       |    |      |    |      |          |         |          |          |      |        |       |      |         |
| SPEC  | 110%±10%                         | 20%±10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 100%±10%                                                   | 100%±10%                                                                                                                                                                                                                                                                     |       |       |    |      |    |      |          |         |          |          |      |        |       |      |         |
| lout  | 107.6%                           | 15.8%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 100%                                                       | 100.59%                                                                                                                                                                                                                                                                      |       |       |    |      |    |      |          |         |          |          |      |        |       |      |         |
| 7     | CURRENT SHARING                  | < ±5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>I/P : 230 VAC<br/>O/P : FULL/50% LOAD<br/>Ta : 25°C</p> | <p>O/P : 100%</p> <p>PSU1 : 34.07 A<br/>PSU2 : 34.72 A<br/>PSU3 : 33.46 A<br/>PSU4 : 34.07 A<br/>PSU5 : 33.04 A<br/>PSU6 : 33.04 A</p> <p>O/P : 50%</p> <p>PSU1 : 17.48 A<br/>PSU2 : 17.76 A<br/>PSU3 : 17.06 A<br/>PSU4 : 17.06 A<br/>PSU5 : 16.55 A<br/>PSU6 : 16.55 A</p> |       |       |    |      |    |      |          |         |          |          |      |        |       |      |         |

## COMPONENT STRESS TEST

| NO | TEST ITEM                                                  | SPECIFICATION          | TEST CONDITION                                                                                                                                                                                                                                                                                                                                                                            | RESULT                                                                                                 |
|----|------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1  | PWM Transistor<br>(D to S) or (C to E) <b>Peak Voltage</b> | Q901 Rated<br>37A/600V | <p>I/P: High-Line +3V = 267V<br/>AC ON/OFF<br/>VDS:<br/>O/P: (1) Full Load<br/>(2) Output Short<br/>(3) Dynamic Load Full Load/<br/>Min. Load 90% Duty/1KHz<br/>(4) Dynamic Load Full Load/<br/>Min. Load 90% Duty/3KHz<br/>(5) Dynamic Load Full Load/<br/>Min. Load 90% Duty/5KHz<br/>(6) Dynamic Load 100% Load/<br/>Min. Load 50% Duty/120Hz<br/>(7) 0% → 400% Load.<br/>Ta: 25°C</p> | <p>VDS:<br/>(1) 566V<br/>(2) 546V<br/>(3) 512V<br/>(4) 568V<br/>(5) 568V<br/>(6) 488V<br/>(7) 550V</p> |



|   |                                                               |                                                                     |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                          |
|---|---------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | P.F.C Transistor<br>( D to S) or (C to E) <b>Peak Voltage</b> | Q52 Rated<br>33A/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 Full Load/<br>Min. Load 90%Duty/1KHz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5)Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6)Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br>Ta:25℃                | VDS:<br>(1)480V<br>(2)472V<br>(3)464V<br>(4)472V<br>(5)456V<br>(6)440V<br>(7)423V                                                                                                                        |
| 3 | Diode Peak <b>Voltage</b>                                     | Q101 Rated<br>65A/200 V<br><br>Q104 Rated<br>65A/200 V              | 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/1KHz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5)Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6)Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br>(8).NO LOAD<br>Ta:25℃ | Q101: VDS:<br>(1)187V<br>(2)181V<br>(3)185V<br>(4)185V<br>(5)183V<br>(6)183V<br>(7)187V<br>(8)177V<br>Q104: VDS:<br>(1)189V<br>(2)195V<br>(3)195V<br>(4)197V<br>(5)195V<br>(6)197V<br>(7)189V<br>(8)177V |
| 4 | Input Capacitor Voltage                                       | C5 Rated:<br>680μ/400V<br>SURGE VOLTAGE:450V                        | I/P:High-Line +3V =267 V<br>O/P: (1)Full Load<br>Ta:25℃                                                                                                                                                                                                                                                                                                     | (1)395V                                                                                                                                                                                                  |
| 5 | Control IC Voltage Test                                       | PFC IC U51 Rated<br>4.5V~ 15V<br><br>PWM IC U901 Rated<br>6.5V~ 24V | I/P:High-Line +3V =267 V<br>AC ON/OFF<br>O/P(1)FULL LOAD<br>(2) Output Short<br>(3)O.L.P<br>(4)O.V.P.<br>Ta:25℃                                                                                                                                                                                                                                             | U51<br>(1) 11.68V<br>(2) 11.68V<br>(3) 11.68V<br>(4) 11.68V<br><br>U901<br>(1)12.56V<br>(2)12.56V<br>(3)12.56V<br>(4)12.56V                                                                              |

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                       | TEST CONDITION                                                                 | RESULT                                                          |
|----|----------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 3KVAC/min<br>I/P-FG :2KVAC/min<br>O/P-FG:1.5KVAC/min       | I/P-O/P: 3.6 KVAC/min<br>I/P-FG: 2.4 KVAC/min<br>O/P-FG:1.8 KVAC/min<br>Ta:25℃ | I/P-O/P:6.9mA<br>I/P-FG:8.04mA<br>O/P-FG:6.28m A<br>NO DAMAGE   |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ<br>I/P-FG: 500VDC>100MΩ<br>O/P-FG:500VDC>100MΩ | I/P-O/P: 500 VDC<br>I/P-FG: 500 VDC<br>O/P-FG: 500 VDC<br>Ta:25℃               | I/P-O/P: 8.16GΩ<br>I/P-FG: 9.35GΩ<br>O/P-FG: 9.4GΩ<br>NO DAMAGE |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                              | 40A / 2min<br>Ta:25℃                                                           | 17 mΩ                                                           |

### E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION                                               | TEST CONDITION                                          | RESULT                        |
|----|---------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------|-------------------------------|
| 1  | HARMONIC                                    | EN61000-3-2<br>CLASS A                                      | I/P:230VAC/50HZ<br>O/P:100% LOAD<br>Ta:25℃              | PASS                          |
| 2  | CONDUCTION                                  | EN55022<br>CLASS B                                          | I/P : 230 VAC (50HZ)<br>O/P : FULL/50% LOAD<br>Ta : 25℃ | PASS<br>Test by certified Lab |
| 3  | RADIATION                                   | EN55022<br>CLASS A                                          | I/P : 230 VAC (50HZ)<br>O/P : FULL LOAD<br>Ta : 25℃     | PASS<br>Test by certified Lab |
| 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℃       | CRITERIA A                    |
| 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℃       | CRITERIA A                    |
| 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℃       | CRITERIA A                    |
| 7  | Test by certified Lab & Test Report Prepare |                                                             |                                                         |                               |

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM                                                         | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TEST CONDITION                                                     | RESULT                |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
|----|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------|----|----------|--------------------------|--------------------------|---|------|--------|--------|---|------|--------|--------|---|-----|--------|--------|---|-----|--------|--------|---|-----|--------|--------|---|------|--------|--------|---|----|--------|--------|---|-------|--------|--------|---|-------|--------|--------|----|----|--------|--------|----|------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|----|--------|--------|----|------|--------|--------|----|------|--------|--------|----|----|--------|--------|----|-----|--------|--------|----|------|--------|--------|----|-----|--------|--------|----|-------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|-----|--------|--------|----|------|--------|--------|
| 1  | TEMPERATURE RISE TEST                                             | <div>MODEL : RSP-1600-24</div> <div>1. ROOM AMBIENT BURN-IN : 1 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta= 28.3 °C</div> <div>2. HIGH AMBIENT BURN-IN : 3 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta= 52.5 °C</div> <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 28.3 °C</th><th>HIGH AMBIENT Ta= 52.5 °C</th></tr><tr><td>1</td><td>Q901</td><td>63.0°C</td><td>93.0°C</td></tr><tr><td>2</td><td>Q904</td><td>60.8°C</td><td>89.5°C</td></tr><tr><td>3</td><td>Q52</td><td>63.1°C</td><td>89.3°C</td></tr><tr><td>4</td><td>D50</td><td>70.3°C</td><td>97.8°C</td></tr><tr><td>5</td><td>BD1</td><td>44.2°C</td><td>69.2°C</td></tr><tr><td>6</td><td>L900</td><td>54.9°C</td><td>80.5°C</td></tr><tr><td>7</td><td>T3</td><td>53.4°C</td><td>80.3°C</td></tr><tr><td>8</td><td>RG301</td><td>71.8°C</td><td>98.9°C</td></tr><tr><td>9</td><td>RG302</td><td>66.6°C</td><td>92.5°C</td></tr><tr><td>10</td><td>T1</td><td>60.5°C</td><td>88.0°C</td></tr><tr><td>11</td><td>Q101</td><td>63.9°C</td><td>94.7°C</td></tr><tr><td>12</td><td>Q104</td><td>61.3°C</td><td>90.9°C</td></tr><tr><td>13</td><td>U921</td><td>43.7°C</td><td>68.2°C</td></tr><tr><td>14</td><td>C5</td><td>38.5°C</td><td>62.4°C</td></tr><tr><td>15</td><td>L100</td><td>71.9°C</td><td>96.4°C</td></tr><tr><td>16</td><td>ZNR1</td><td>29.2°C</td><td>53.3°C</td></tr><tr><td>17</td><td>L2</td><td>47.4°C</td><td>71.9°C</td></tr><tr><td>18</td><td>RY1</td><td>33.3°C</td><td>58.0°C</td></tr><tr><td>19</td><td>C101</td><td>31.3°C</td><td>55.1°C</td></tr><tr><td>20</td><td>T52</td><td>41.7°C</td><td>66.6°C</td></tr><tr><td>21</td><td>RTH21</td><td>55.7°C</td><td>82.7°C</td></tr><tr><td>22</td><td>RTH9</td><td>44.4°C</td><td>68.5°C</td></tr><tr><td>23</td><td>U671</td><td>31.3°C</td><td>55.2°C</td></tr><tr><td>24</td><td>U82</td><td>59.7°C</td><td>86.3°C</td></tr><tr><td>25</td><td>Q151</td><td>40.9°C</td><td>65.0°C</td></tr></table> |                                                                    |                       | NO | Position | ROOM AMBIENT Ta= 28.3 °C | HIGH AMBIENT Ta= 52.5 °C | 1 | Q901 | 63.0°C | 93.0°C | 2 | Q904 | 60.8°C | 89.5°C | 3 | Q52 | 63.1°C | 89.3°C | 4 | D50 | 70.3°C | 97.8°C | 5 | BD1 | 44.2°C | 69.2°C | 6 | L900 | 54.9°C | 80.5°C | 7 | T3 | 53.4°C | 80.3°C | 8 | RG301 | 71.8°C | 98.9°C | 9 | RG302 | 66.6°C | 92.5°C | 10 | T1 | 60.5°C | 88.0°C | 11 | Q101 | 63.9°C | 94.7°C | 12 | Q104 | 61.3°C | 90.9°C | 13 | U921 | 43.7°C | 68.2°C | 14 | C5 | 38.5°C | 62.4°C | 15 | L100 | 71.9°C | 96.4°C | 16 | ZNR1 | 29.2°C | 53.3°C | 17 | L2 | 47.4°C | 71.9°C | 18 | RY1 | 33.3°C | 58.0°C | 19 | C101 | 31.3°C | 55.1°C | 20 | T52 | 41.7°C | 66.6°C | 21 | RTH21 | 55.7°C | 82.7°C | 22 | RTH9 | 44.4°C | 68.5°C | 23 | U671 | 31.3°C | 55.2°C | 24 | U82 | 59.7°C | 86.3°C | 25 | Q151 | 40.9°C | 65.0°C |
| NO | Position                                                          | ROOM AMBIENT Ta= 28.3 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | HIGH AMBIENT Ta= 52.5 °C                                           |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 1  | Q901                                                              | 63.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 93.0°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 2  | Q904                                                              | 60.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 89.5°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 3  | Q52                                                               | 63.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 89.3°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 4  | D50                                                               | 70.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 97.8°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 5  | BD1                                                               | 44.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 69.2°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 6  | L900                                                              | 54.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 80.5°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 7  | T3                                                                | 53.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 80.3°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 8  | RG301                                                             | 71.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 98.9°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 9  | RG302                                                             | 66.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 92.5°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 10 | T1                                                                | 60.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 88.0°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 11 | Q101                                                              | 63.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 94.7°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 12 | Q104                                                              | 61.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 90.9°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 13 | U921                                                              | 43.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 68.2°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 14 | C5                                                                | 38.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 62.4°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 15 | L100                                                              | 71.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 96.4°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 16 | ZNR1                                                              | 29.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 53.3°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 17 | L2                                                                | 47.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 71.9°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 18 | RY1                                                               | 33.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 58.0°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 19 | C101                                                              | 31.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 55.1°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 20 | T52                                                               | 41.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 66.6°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 21 | RTH21                                                             | 55.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 82.7°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 22 | RTH9                                                              | 44.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 68.5°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 23 | U671                                                              | 31.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 55.2°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 24 | U82                                                               | 59.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 86.3°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 25 | Q151                                                              | 40.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 65.0°C                                                             |                       |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 2  | OVER LOAD BURN-IN TEST                                            | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | I/P : 230 VAC<br>O/P : 105% LOAD<br>Ta : 25°C                      | TEST : OK             |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | I/P : 230VAC/180VAC<br>O/P : 100 % LOAD<br>Ta= -35°C/-30°C         | TEST : OK             |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 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             |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03 %/°C (0~50°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | I/P : 230 VAC<br>O/P : FULL LOAD                                   | ± 0.002 %/°C (0~50°C) |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |

|    |                             |                                                                                                                                                                                                                                                                                                                                                                                             |                                                                   |
|----|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 6  | STORAGE TEMPERATURE TEST    | 1. Thermal shock Temperature : $-45^{\circ}\text{C} \sim +90^{\circ}\text{C}$<br>2. Temperature change rate : $25^{\circ}\text{C} / \text{MIN}$<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                                                                |
| 7  | THERMAL SHOCK TEST          | 1. Thermal shock Temperature : $-35^{\circ}\text{C} \sim +55^{\circ}\text{C}$<br>2. Temperature change rate : $25^{\circ}\text{C} / \text{MIN}$<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition :<br><br>15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST(13500 TIMES)<br><br>1cycle:230V/ FULL LOAD Burn In Test | OK                                                                |
| 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 : $25^{\circ}\text{C}$                                                                                                                                                                      | TEST : OK                                                         |
| 9  | CAPACITOR LIFE CYCLE        | SUPPOSE C101 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= $25^{\circ}\text{C}$ LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= $50^{\circ}\text{C}$ LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta= $50^{\circ}\text{C}$ LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta= $50^{\circ}\text{C}$ LIFE TIME                                                       | (1) 2451612HRS<br>(2) 445544HRS<br>(3) 480914HRS<br>(4) 490935HRS |
| 10 | MTBF                        | Conducted by Parts Stress Analysis Prediction<br>160.9K hrs min. Telcordia SR-332 (Bellcore) ; 42.1K hrs min. MIL-HDBK-217F ( $25^{\circ}\text{C}$ )                                                                                                                                                                                                                                        |                                                                   |
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA $50^{\circ}\text{C}$                                                                                                                                                                                                                                                                                       |                                                                   |

| TEST RESULT | TESTER     | REVIEW     | APPROVAL      |
|-------------|------------|------------|---------------|
| PASS        | DANIEL GAO | SANFORD SU | VINCENT TSENG |

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