



# Test Report:RCB-1600-12

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1600W Rack Mountable Front End Battery Charger

## ■ 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

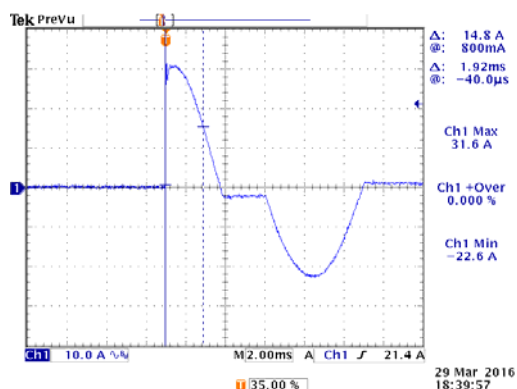
| NO | TEST ITEM                             | SPECIFICATION                            | TEST CONDITION                            | RESULT                                       |
|----|---------------------------------------|------------------------------------------|-------------------------------------------|----------------------------------------------|
| 1  | BOOST CHARGE VOLTAGE(Vboost)(default) | Default, programmable<br>14.4V±0.12V     | I/P: 230 VAC<br>O/P: CV MODE<br>Ta:25°C   | 14.409V                                      |
| 2  | FLOAT CHARGE VOLTAGE                  | Default, programmable<br>13.8V±0.12V     | I/P: 230 VAC<br>O/P: CV MODE<br>Ta:25°C   | 13.874V                                      |
| 3  | OUTPUT CURRENT                        | 100A±3A                                  | I/P: 230 VAC<br>O/P:CV MODE-2V<br>Ta:25°C | 100A                                         |
| 4  | VOLTAGE ADJ. RANGE                    | 11.5V~15V<br>DIP switch position 4 : OFF | I/P: 230 VAC<br>O/P:NO LOAD<br>Ta:25°C    | 11.03V~15.26V/230VAC<br>11.03V~15.26V/115VAC |
| 5  | LEAKAGE CURRENT FROM BATTERY (Typ.)   | <45mA                                    | I/P: AC OFF<br>O/P:BATTERY<br>Ta:25°C     | 39.83mA                                      |

### 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>O/P:60% LOAD<br>Ta:25°C                                                                                                              | 150 V~ 264 V<br>87V~264V              |
|    |                       |                           | I/P:<br>LOW-LINE-3V=87 V<br>HIGH-LINE+15%= 300 V<br>O/P:BAT. LOAD<br>(PLEASE CHECK DERATING CURVE)<br>ON: 30 Sec . OFF: 30 Sec 10MIN<br>( AC POWER ON/OFF NO DAMAGE ) | TEST: OK                              |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE  | I/P: 100 VAC ~264 VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C                                                                                                                 | TEST: OK                              |
| 3  | LEAKAGE CURRENT       | < 1.5 mA / 230VAC         | I/P: 230 VAC<br>O/P:Min LOAD<br>Ta:25°C                                                                                                                               | L-FG: 0.74 mA<br>N-FG:0.74 mA         |
| 4  | INPUT CURRENT (TYP)   | 230 V/ 8 A<br>115 V/ 14 A | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P: FULL LOAD<br>Ta:25°C                                                                                                             | I =7.49A/ 230VAC<br>I =12.41A/ 115VAC |
| 5  | POWER FACTOR (TYP)    | 0.97/ 230 VAC             | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta:25°C                                                                                                                             | PF= 0.977 / 230VAC                    |
| 6  | EFFICIENCY (TYP)      | 90.5%                     | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta:25°C                                                                                                                             | 90.97 %                               |
| 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

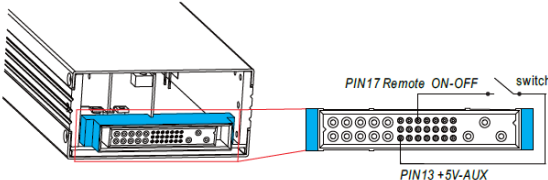
CH1 : Input current



### PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                                                                                               | TEST CONDITION                                                       | RESULT                                                                                                               |
|----|-----------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 1  | OVER VOLTAGE PROTECTION     | 15.75 V~ 18.75 V<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 | 17.5V/ 264VAC<br>17.5V/ 230VAC<br>17.5V/ 90VAC<br>PROTECTION TYPE :<br>Shut down o/p voltage, re-power on to recover |
| 2  | OVER TEMPERATURE PROTECTION | NO DAMAGE<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      |

### 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℃ | 4.74 V 0.3 A ; ripple: 24mVp-p<br>11.28V 0.8 A ; ripple: 195 mVp-p |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |
| 2                                 | REMOTE ON/OFF CONTROL | <p>The charger can be turned ON/OFF individually or along with other units in parallel by using the "Remote ON-OFF" function.</p>  <p>I/P: 230 VAC<br/>O/P:FULL LOAD<br/>Ta:25℃<br/>Test Result :</p> <table><thead><tr><th>Between Remote ON-OFF and +5V-AUX</th><th>OUTPUT</th></tr></thead><tbody><tr><td>SW SHORT</td><td>ON</td></tr><tr><td>SW OPEN</td><td>OFF</td></tr></tbody></table> | Between Remote ON-OFF and +5V-AUX       | OUTPUT                                                             | SW SHORT | ON | SW OPEN | OFF | <table><thead><tr><th>Between Remote ON-OFF and +5V-AUX</th><th>Charger Status</th></tr></thead><tbody><tr><td>Switch Short</td><td>ON</td></tr><tr><td>Switch Open</td><td>OFF</td></tr></tbody></table> | Between Remote ON-OFF and +5V-AUX | Charger Status | Switch Short | ON | Switch Open | OFF |
| Between Remote ON-OFF and +5V-AUX | OUTPUT                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                    |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |
| SW SHORT                          | ON                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                    |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |
| SW OPEN                           | OFF                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                    |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |
| Between Remote ON-OFF and +5V-AUX | Charger Status        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                    |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |
| Switch Short                      | ON                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                    |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |
| Switch Open                       | OFF                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                    |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |
| 3                                 | ALARM SIGNAL          | 1. DC OK SIGNAL<br>High (4.5 ~ 5.5V) : When the Vout≤8V/16V/32V ±1V.<br>Low (0 ~ 0.5V) : When Vout≥8V/16V/32V +1V. The maximum sourcing current is 10mA and only for output                                                                                                                                                                                                                                                                                                         |                                         |                                                                    |          |    |         |     |                                                                                                                                                                                                           |                                   |                |              |    |             |     |

DC OK is associated with battery low protection.

I/P: 230 VAC

O/P: FULL LOAD

Ta: 25°C

Test Result :

| Vout                | DC OK SIGNAL |
|---------------------|--------------|
| $V_{out} \leq 75\%$ | 5V           |
| $V_{out} \geq 85\%$ | -0.09V       |

## 2. T-ALARM

| P.S.U STATUS    | Vo      | T-ALARM    |
|-----------------|---------|------------|
| NORMAL          | 100%±2% | -0.1 ~0.5V |
| OTP OR FAN LOCK | 0V      | 4.5~5.5V   |

I/P: 230 VAC

O/P: FULL LOAD

Ta: 25°C

Test Result :

| P.S.U STATUS    | T-ALARM |
|-----------------|---------|
| NORMAL          | -0.09V  |
| OTP OR FAN LOCK | 4.937V  |

## 3. AC- OK :

| AC IN                    | Vo      | AC OK    |
|--------------------------|---------|----------|
| $AC\ I/P \geq 87V_{rms}$ | 100%±2% | 4.5~5.5V |
| $AC\ I/P \leq 75V_{rms}$ | 0V      | 0~0.5V   |

I/P: TEST

O/P: 60% LOAD

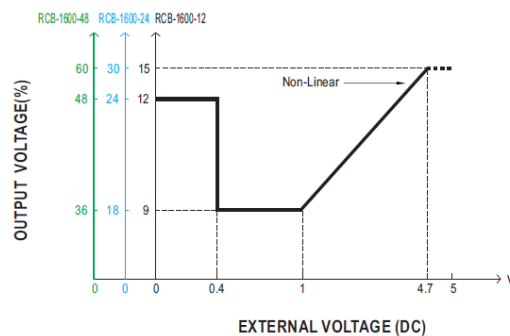
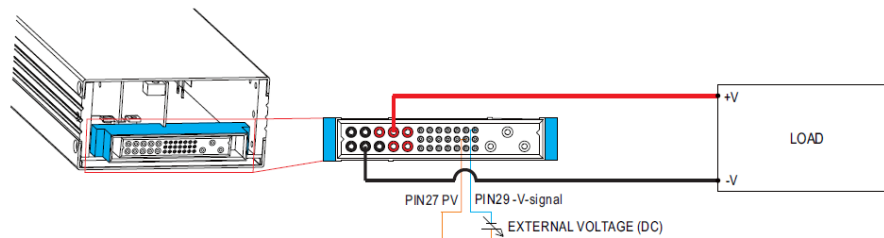
Test Result :

| AC IN              | Vo     | AC OK |
|--------------------|--------|-------|
| $AC\ I/P \geq 87V$ | 100.4% | 5.36V |
| $AC\ I/P \leq 75V$ | 0.002V | 0.00V |

## 4 OUTPUT VOLTAGE PROGRAMMABLE(PV)

DIP switch position 4 : OFF

※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed to 75~125% of the nominal voltage by applying EXTERNAL VOLTAGE.

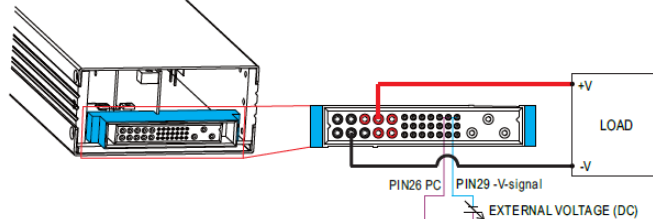
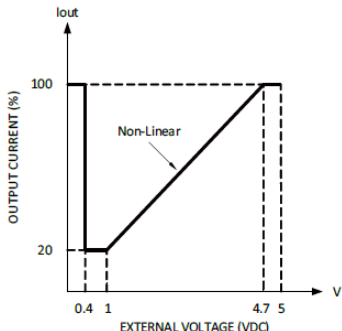
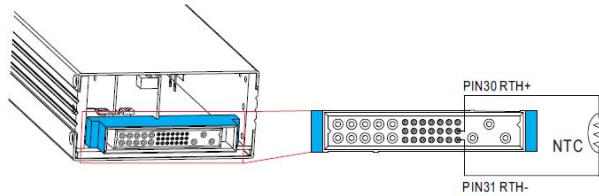


I/P: 230 VAC

O/P: FULL LOAD

Test Result :

Ta: 25°C

|             |                                  | <table><tr><td>PV</td><td>&lt;0.4V</td><td>1V</td><td>4.7V</td><td>5V</td></tr><tr><td>MODEL</td><td></td><td></td><td></td><td></td></tr><tr><td>SPEC</td><td>12V±5%</td><td>9V±5%</td><td>15V±5%</td><td>15V±5%</td></tr><tr><td>Vout</td><td>12.088V</td><td>8.941V</td><td>14.929V</td><td>15.132V</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PV       | <0.4V                | 1V                       | 4.7V | 5V     | MODEL |            |                        |          |          | SPEC        | 12V±5%     | 9V±5%   | 15V±5%  | 15V±5%      | Vout                   | 12.088V | 8.941V  | 14.929V | 15.132V |
|-------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------|--------------------------|------|--------|-------|------------|------------------------|----------|----------|-------------|------------|---------|---------|-------------|------------------------|---------|---------|---------|---------|
| PV          | <0.4V                            | 1V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.7V     | 5V                   |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| MODEL       |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                      |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| SPEC        | 12V±5%                           | 9V±5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15V±5%   | 15V±5%               |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| Vout        | 12.088V                          | 8.941V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 14.929V  | 15.132V              |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| 5           | OUTPUT CURRENT PROGRAMMABLE (PC) | <p>DIP switch position 4 : OFF</p> <p>※ The output current can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.</p> <div></div> <div></div> <p>I/P: 230 VAC<br/>O/P: TESTING<br/>Ta: 25°C<br/>Test Result :</p> <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>100%±10%</td><td>20%±10%</td><td>100%±10%</td><td>100%±10%</td></tr><tr><td>Iout</td><td>101.45%</td><td>20.58%</td><td>101.45%</td><td>102.18%</td></tr></table>                                                                                                                                                                                                               | ADJ V    | <0.4V                | 1V                       | 4.7V | 5V     | SPEC  | 100%±10%   | 20%±10%                | 100%±10% | 100%±10% | Iout        | 101.45%    | 20.58%  | 101.45% | 102.18%     |                        |         |         |         |         |
| ADJ V       | <0.4V                            | 1V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.7V     | 5V                   |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| SPEC        | 100%±10%                         | 20%±10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 100%±10% | 100%±10%             |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| Iout        | 101.45%                          | 20.58%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 101.45%  | 102.18%              |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| 6           | TEMPERATURE COMPENSATION         | <p>-3mV /°C/ cell / (12V = 6 cells ; 24V = 12 cells ; 48V = 24 cells)</p> <div></div> <p>I/P: 230 VAC<br/>O/P: FULL LOAD<br/>Test Result :</p> <table><tr><th rowspan="2">TEMP</th><th rowspan="2">Voltage compensation</th><th colspan="2">Temperature compensation</th></tr><tr><th>BEFORE</th><th>AFTER</th></tr><tr><td>( Ta=0°C )</td><td>14.4V = + 0.45V ±0.12V</td><td>14.438V</td><td>14.871V</td></tr><tr><td>( Ta=25°C )</td><td>14.4V = 0V</td><td>14.443V</td><td>14.443V</td></tr><tr><td>( Ta=50°C )</td><td>14.4V = - 0.45V ±0.12V</td><td>14.444V</td><td>14.038V</td></tr></table> <p>● To exploit the temperature compensation function, please attach the temperature sensor, NTC, to the battery or the battery's vicinity.<br/>● The charger is able to work normally without the NTC.</p> | TEMP     | Voltage compensation | Temperature compensation |      | BEFORE | AFTER | ( Ta=0°C ) | 14.4V = + 0.45V ±0.12V | 14.438V  | 14.871V  | ( Ta=25°C ) | 14.4V = 0V | 14.443V | 14.443V | ( Ta=50°C ) | 14.4V = - 0.45V ±0.12V | 14.444V | 14.038V |         |         |
| TEMP        | Voltage compensation             | Temperature compensation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |                      |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
|             |                                  | BEFORE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | AFTER    |                      |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| ( Ta=0°C )  | 14.4V = + 0.45V ±0.12V           | 14.438V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.871V  |                      |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| ( Ta=25°C ) | 14.4V = 0V                       | 14.443V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.443V  |                      |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |
| ( Ta=50°C ) | 14.4V = - 0.45V ±0.12V           | 14.444V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.038V  |                      |                          |      |        |       |            |                        |          |          |             |            |         |         |             |                        |         |         |         |         |

7

Charging Curve

※ By factory default, this charger performs the default curve which can be programmed via PMBus.

※ To disable / enable the charging curve, change to a 2 stage curve, a different curve frequently used for certain types of batteries in the industry, and so on, please refer to the Installation Manual.

◎ Default 3 stage charging curve

3 Stage

The graph illustrates the 3-stage charging process. The top line represents Charge Voltage, which rises linearly in stage 1, remains constant in stage 2, and drops to a float level in stage 3. The bottom line represents Charge Current, which is constant in stage 1 and decreases exponentially in stage 2. The LED color transitions from Orange in stage 1 to Green in stage 3. A status indicator shows 'Charger fail if charging time exceed charging timeout'.

◎ Suitable for lead-acid batteries (flooded, Gel and AGM) and Li-ion batteries (lithium iron and lithium manganese).

I/P: 230 VAC

O/P: FULL LOAD

Test Result :

| MODEL | Constant voltage( $V_{boost}$ ) | Float ( $V_{float}$ ) | Turn state current |
|-------|---------------------------------|-----------------------|--------------------|
| 12V   | $14.4V \pm 0.12V$               | $13.8V \pm 0.12V$     | $10A \pm 3.0A$     |
|       | 14.43V                          | 13.82V                | 9.85A              |

◎ Embedded 3 stage charging curve

| MODEL | Description                  | $V_{boost}$ | $V_{float}$ |
|-------|------------------------------|-------------|-------------|
| 12V   | Default, programmable        | 14.4        | 13.8        |
|       | Pre-defined, gel batter      | 14          | 13.6        |
|       | Pre-defined, flooded battery | 14.2        | 13.4        |
|       | Pre-defined, AGM battery     | 14.5        | 13.5        |
| 24V   | Default, programmable        | 28.8        | 27.6        |
|       | Pre-defined, gel batter      | 28          | 27.2        |
|       | Pre-defined, flooded battery | 28.4        | 26.8        |
|       | Pre-defined, AGM battery     | 29          | 27          |
| 48V   | Default, programmable        | 57.6        | 55.2        |
|       | Pre-defined, gel batter      | 56          | 54.4        |
|       | Pre-defined, flooded battery | 56.8        | 53.6        |
|       | Pre-defined, AGM battery     | 58          | 54          |

8

LED Status Indicators

※ LED Status Indicators

| LED              | Description                                                                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ● Green          | Float (stage 3)                                                                                                                                                                                                                                 |
| ● Orange         | Charging (stage 1 or stage 2)                                                                                                                                                                                                                   |
| ● Red            | The LED will present a constant red light when the abnormal status (OTP, OLP, fan fail and charging timeout) arises.                                                                                                                            |
| ● Red (Flashing) | The LED will flash with the red light when the internal temperature reaches 60°C; under this condition, the unit still operates normally without entering OTP. (In the meantime, an alarm signal will be sent out through the PMBus interface.) |

TEST : OK

## 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>29A/600 V                                                                               | I/P:High-Line +3V =267V<br>AC ON/OFF<br>VDS:<br>O/P: (1)Full Load<br>Ta:25°C | VDS:<br>(1)494V                                   |
| 2  | P.F.C Transistor<br>( D to S) or (C to E) <b>Peak Voltage</b> | Q52 Rated<br>52 A/600 V                                                                               | I/P:High-Line +3V =267 V<br>AC ON/OFF<br>O/P: (1)Full Load<br>Ta:25°C        | VDS:<br>(1)439V                                   |
| 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°C                     | (1)397V                                           |
| 5  | Control IC Voltage Test                                       | PWM IC U901 Rated<br>6.5 V~24 V<br><br>PFC IC U51 Rated<br>6V~16V<br><br>O/P IC U142 Rated<br>4V~ 15V | I/P:High-Line +3V =267 V<br>AC ON/OFF<br>O/P(1)FULL LOAD<br>Ta:25°C          | U901<br>13.4 V<br>U51<br>12.93V<br>U142<br>12.5 V |
| 6  | Transistor                                                    | Q154 Rated :<br>100A/40V                                                                              | I/P:High-Line +3V =267 V<br>O/P:<br>(1)FULL LOAD                             | (1)2.4 V                                          |
| 7  | Transistor                                                    | Q163 Rated :<br>3.8A/100V                                                                             | I/P:High-Line +3V =267 V<br>O/P:<br>(1) FULL LOAD                            | (1)0.948V<br>(2)0.744V                            |

|   |                    |                                                                    | (2)NO LOAD                                                                                                 |                                                                                          |
|---|--------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 8 | Diode Peak Voltage | Q101 Rated<br>74A/150 V<br>VGS:±20V<br><br>Q104 Rated<br>74A/150 V | I/P:High-Line +3V =267 V<br>AC ON/OFF<br>O/P:<br>(1) FULL LOAD<br>(2)Output Short<br>(3).NO LOAD<br>Ta:25℃ | VDS:<br>(1)58.4V<br>(2)51.2V<br>(3)61.0V<br><br>VDS:<br>(1)49.4V<br>(2)51.4V<br>(3)72.3V |

### 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:6.23mA<br>I/P-FG:5.77mA<br>O/P-FG:6.08m 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: 7.28GΩ<br>I/P-FG: 5.7GΩ<br>O/P-FG: 9.2GΩ<br>NO DAMAGE |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                              | 40A / 2min<br>Ta:25℃                                                           | 17mΩ                                                           |

### 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>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>INDUSTRY<br>INPUT : 2KV                | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25℃       | CRITERIA A                    |
| 6  | SURGE                                       | IEC61000-4-5<br>INDUSTRY<br>L-N : 2KV<br>L,N-PE : 4KV | 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 : RCB-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>48.6°C</td><td>72.3°C</td></tr><tr><td>2</td><td>Q904</td><td>75.5°C</td><td>81.5°C</td></tr><tr><td>3</td><td>Q52</td><td>63.2°C</td><td>87.8°C</td></tr><tr><td>4</td><td>D50</td><td>68.9°C</td><td>99.6°C</td></tr><tr><td>5</td><td>BD1</td><td>58.1°C</td><td>85.6°C</td></tr><tr><td>6</td><td>L900</td><td>45.9°C</td><td>68.6°C</td></tr><tr><td>7</td><td>T3</td><td>37.6°C</td><td>61.7°C</td></tr><tr><td>8</td><td>RG301</td><td>53.9°C</td><td>81.7°C</td></tr><tr><td>9</td><td>RG302</td><td>51.7°C</td><td>76.2°C</td></tr><tr><td>10</td><td>C302</td><td>30.3°C</td><td>55.3°C</td></tr><tr><td>11</td><td>C355</td><td>38.1°C</td><td>59.4°C</td></tr><tr><td>12</td><td>T1</td><td>30.2°C</td><td>76.1°C</td></tr><tr><td>13</td><td>Q101</td><td>47.8°C</td><td>76.0°C</td></tr><tr><td>14</td><td>Q104</td><td>48.7°C</td><td>77.2°C</td></tr><tr><td>15</td><td>U921</td><td>41.9°C</td><td>70.4°C</td></tr><tr><td>16</td><td>C5</td><td>38.4°C</td><td>64.2°C</td></tr><tr><td>17</td><td>L100</td><td>65.7°C</td><td>97.8°C</td></tr><tr><td>18</td><td>C980</td><td>33.4°C</td><td>63.9°C</td></tr><tr><td>19</td><td>C11</td><td>42.8°C</td><td>69.2°C</td></tr><tr><td>20</td><td>ZNR1</td><td>46.0°C</td><td>70.9°C</td></tr><tr><td>21</td><td>ZNR2</td><td>42.3°C</td><td>75.6°C</td></tr><tr><td>22</td><td>LF1</td><td>43.8°C</td><td>69.7°C</td></tr><tr><td>23</td><td>C2</td><td>43.0°C</td><td>69.7°C</td></tr><tr><td>24</td><td>D2</td><td>42.9°C</td><td>65.1°C</td></tr><tr><td>25</td><td>L1</td><td>49.1°C</td><td>77.9°C</td></tr><tr><td>26</td><td>L2</td><td>51.0°C</td><td>79.1°C</td></tr><tr><td>27</td><td>RY1</td><td>45.3°C</td><td>71.4°C</td></tr><tr><td>28</td><td>C101</td><td>47.0°C</td><td>73.6°C</td></tr><tr><td>29</td><td>T52</td><td>37.9°C</td><td>65.3°C</td></tr><tr><td>30</td><td>RTH21</td><td>54.0°C</td><td>76.4°C</td></tr><tr><td>31</td><td>RTH9</td><td>45.3°C</td><td>72.3°C</td></tr><tr><td>32</td><td>U671</td><td>43.8°C</td><td>70.0°C</td></tr></table> |                                                                    |           | NO | Position | ROOM AMBIENT Ta= 28.3 °C | HIGH AMBIENT Ta= 52.5 °C | 1 | Q901 | 48.6°C | 72.3°C | 2 | Q904 | 75.5°C | 81.5°C | 3 | Q52 | 63.2°C | 87.8°C | 4 | D50 | 68.9°C | 99.6°C | 5 | BD1 | 58.1°C | 85.6°C | 6 | L900 | 45.9°C | 68.6°C | 7 | T3 | 37.6°C | 61.7°C | 8 | RG301 | 53.9°C | 81.7°C | 9 | RG302 | 51.7°C | 76.2°C | 10 | C302 | 30.3°C | 55.3°C | 11 | C355 | 38.1°C | 59.4°C | 12 | T1 | 30.2°C | 76.1°C | 13 | Q101 | 47.8°C | 76.0°C | 14 | Q104 | 48.7°C | 77.2°C | 15 | U921 | 41.9°C | 70.4°C | 16 | C5 | 38.4°C | 64.2°C | 17 | L100 | 65.7°C | 97.8°C | 18 | C980 | 33.4°C | 63.9°C | 19 | C11 | 42.8°C | 69.2°C | 20 | ZNR1 | 46.0°C | 70.9°C | 21 | ZNR2 | 42.3°C | 75.6°C | 22 | LF1 | 43.8°C | 69.7°C | 23 | C2 | 43.0°C | 69.7°C | 24 | D2 | 42.9°C | 65.1°C | 25 | L1 | 49.1°C | 77.9°C | 26 | L2 | 51.0°C | 79.1°C | 27 | RY1 | 45.3°C | 71.4°C | 28 | C101 | 47.0°C | 73.6°C | 29 | T52 | 37.9°C | 65.3°C | 30 | RTH21 | 54.0°C | 76.4°C | 31 | RTH9 | 45.3°C | 72.3°C | 32 | U671 | 43.8°C | 70.0°C |
| NO | Position                                                          | ROOM AMBIENT Ta= 28.3 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | HIGH AMBIENT Ta= 52.5 °C                                           |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 1  | Q901                                                              | 48.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 72.3°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 2  | Q904                                                              | 75.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 81.5°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 3  | Q52                                                               | 63.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 87.8°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 4  | D50                                                               | 68.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 99.6°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 5  | BD1                                                               | 58.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 85.6°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 6  | L900                                                              | 45.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 68.6°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 7  | T3                                                                | 37.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 61.7°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 8  | RG301                                                             | 53.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 81.7°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 9  | RG302                                                             | 51.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 76.2°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 10 | C302                                                              | 30.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 55.3°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 11 | C355                                                              | 38.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 59.4°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 12 | T1                                                                | 30.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 76.1°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 13 | Q101                                                              | 47.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 76.0°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 14 | Q104                                                              | 48.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 77.2°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 15 | U921                                                              | 41.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 70.4°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 16 | C5                                                                | 38.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 64.2°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 17 | L100                                                              | 65.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 97.8°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 18 | C980                                                              | 33.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 63.9°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 19 | C11                                                               | 42.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 69.2°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 20 | ZNR1                                                              | 46.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 70.9°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 21 | ZNR2                                                              | 42.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 75.6°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 22 | LF1                                                               | 43.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 69.7°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 23 | C2                                                                | 43.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 69.7°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 24 | D2                                                                | 42.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 65.1°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 25 | L1                                                                | 49.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 77.9°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 26 | L2                                                                | 51.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 79.1°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 27 | RY1                                                               | 45.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 71.4°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 28 | C101                                                              | 47.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 73.6°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 29 | T52                                                               | 37.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 65.3°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 30 | RTH21                                                             | 54.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 76.4°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 31 | RTH9                                                              | 45.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 72.3°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 32 | U671                                                              | 43.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 70.0°C                                                             |           |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 2  | 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 |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |
| 3  | 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 |    |          |                          |                          |   |      |        |        |   |      |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |      |        |        |   |    |        |        |   |       |        |        |   |       |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |      |        |        |    |     |        |        |    |       |        |        |    |      |        |        |    |      |        |        |

|    |                             |                                                                                                                                                                                                                                                                                                                                     |                                  |                                                                  |
|----|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------|
| 4  | TEMPERATURE COEFFICIENT     | $\pm 0.03\%/^{\circ}\text{C}$ (0~50°C)                                                                                                                                                                                                                                                                                              | I/P : 230 VAC<br>O/P : FULL LOAD | $\pm 0.005\%/^{\circ}\text{C}$ (0~50°C)                          |
| 5  | STORAGE TEMPERATURE TEST    | 1. Thermal shock Temperature : -45°C ~ +90°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 5 CYCLE<br>5. Input/Output condition : STATIC                                                                                                              |                                  | OK                                                               |
| 6  | THERMAL SHOCK TEST          | 1. Thermal shock Temperature : -35°C ~ +55°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition :<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                                                               |
| 7  | VIBRATION TEST              | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Sweep Time : 12min/sweep cycle<br>(4) Acceleration : 2G<br>(5) Test Time : 60min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                                              |                                  | TEST : OK                                                        |
| 8  | CAPACITOR LIFE CYCLE        | SUPPOSE C101 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25°C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= 50°C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta= 50°C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta= 50°C LIFE TIME                                                               |                                  | (1) 781466HRS<br>(2) 119480HRS<br>(3) 179758HRS<br>(4) 222934HRS |
| 9  | MTBF                        | Conducted by Parts Stress Analysis Prediction<br>160.9K hrs min. Telcordia SR-332 (Bellcore) ; 42.1K hrs min. MIL-HDBK-217F (25°C)                                                                                                                                                                                                  |                                  |                                                                  |
| 10 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C                                                                                                                                                                                                                                               |                                  |                                                                  |

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

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