



# Test Report: CSP-3000-120

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## 3000W Power Supply with Single Output

### ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

### ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

### ■ RELIABILITY TEST

Environment Test

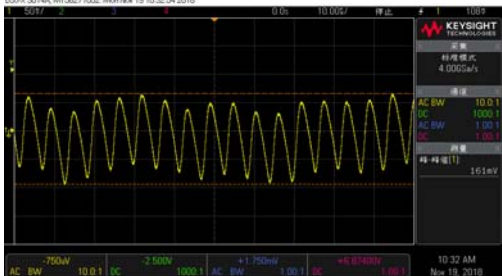


## 3000W Power Supply with Single Output

## CSP-3000 series

### DESIGN VERIFY TEST

#### OUTPUT FUNCTION TEST

| N O                                                                                                                                                                                                                                     | TEST ITEM                    | SPECIFICATION | TEST CONDITION                                         | RESULT           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------|--------------------------------------------------------|------------------|
| 1                                                                                                                                                                                                                                       | CONSTANT CURRENT REGION      | 90V~120V      | I/P: 230 VAC<br>O/P: TESTING<br>Ta: 25°C               | 13.5 V~ 120 V    |
| 2                                                                                                                                                                                                                                       | OUTPUT VOLTAGE TOLERANCE     | -1%~+1%       | I/P: 180VAC ~ 264VAC<br>O/P: FULL/ NO LOAD<br>Ta: 25°C | -0.153%~ 0.124 % |
| 3                                                                                                                                                                                                                                       | LINE REGULATION              | -0.5%~+0.5%   | I/P: 180VAC ~ 264VAC<br>O/P: FULL/ NO LOAD<br>Ta: 25°C | -0.155% ~ 0.041% |
| 4                                                                                                                                                                                                                                       | LOAD REGULATION              | -0.5%~+0.5%   | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C             | -0.155% ~ 0.041% |
| 5                                                                                                                                                                                                                                       | VOLTAGE OVER/UNDERSHOOT TEST | <± 5 %        | I/P: 230VAC<br>O/P: FULL LOAD/NO LOAD<br>Ta: 25°C      | 1%               |
| 6                                                                                                                                                                                                                                       | RIPPLE & NOISE               | 800mVp-p      | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C              | 185 mVp-p        |
| <div>high frequency :<br/></div> <div>low frequency :<br/></div> |                              |               |                                                        |                  |
| 7                                                                                                                                                                                                                                       | SET UP TIME(Max)             | 1000ms/230VAC | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C             | 674 ms/230 VAC   |
| <div>INPUT=230VAC/50HZ @ FULL LOAD<br/>CH1: Output Voltage CH2: AC Input Voltage<br/></div>                                                          |                              |               |                                                        |                  |



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# CSP-3000 series

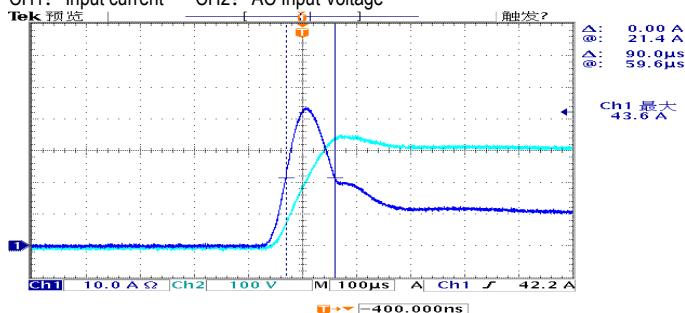
|                                                                                                                                                                                                                                                  |                    |                     |                                                                                                               |                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| 8                                                                                                                                                                                                                                                | RISE TIME (Max)    | 230VAC/ 80ms        | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                    | 58ms /230VAC FULL LOAD                  |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1: Output Voltage<br>                                                                                                        |                    |                     |                                                                                                               |                                         |
| 9                                                                                                                                                                                                                                                | HOLD UP TIME(Typ ) | 230VAC/ 10ms        | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                    | 230VAC/ 13ms                            |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1: Output Voltage CH2: AC Input Voltage<br>                                                                                |                    |                     |                                                                                                               |                                         |
| 10                                                                                                                                                                                                                                               | DYNAMIC LOAD       | V1: 12000mVp-p(Max) | I/P: 230VAC<br>O/P:<br>(1) FULL / Min LOAD 90%DUTY / 1KHZ<br>(2) 50% LOAD/Min LOAD 50%DUTY / 1KHZ<br>Ta: 25°C | TEST:<br>(1) 960 mVp-p<br>(2) 1590mVp-p |
| 1、FULL/Min LOAD 90%DUTY / 1KHZ<br> 2、50% LOAD/Min LOAD 50%DUTY / 1KHZ<br> |                    |                     |                                                                                                               |                                         |

# INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                    | TEST CONDITION                                                                                                                       | RESULT                         |
|----|-----------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1  | INPUT VOLTAGE RANGE   | 180VAC~264 VAC                   | I/P: TESTING<br>O/P: FULL LOAD<br>(PLEASE CHECK DERATING CURVE)<br>Ta: 25°C                                                          | 177V~300V                      |
|    |                       |                                  | I/P:<br>LOW-LINE-3V=177 V<br>HIGH-LINE+15%=300 V<br>O/P: FULL/MIN LOAD<br>ON: 30 Sec OFF: 30 Sec 10MIN<br>( POWER ON/OFF NO DAMAGE ) | TEST: OK                       |
| 2  | INPUT FREQUENCY RANGE | 50 HZ<br>NO DAMAGE               | I/P: 180 VAC ~264 VAC<br>O/P: FULL~NO LOAD<br>Ta: 25°C                                                                               | TEST: OK                       |
| 3  | AC CURRENT            | 230 VAC/ 16 A                    | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                                           | I = 14.25A/ 230VAC             |
| 4  | LEAKAGE CURRENT       | < 0.3mA / 240VAC                 | I/P: 240VAC<br>O/P: NO LOAD<br>Ta: 25°C                                                                                              | L-FG: 0.229mA<br>N-FG: 0.266mA |
| 5  | INRUSH CURRENT(Typ)   | 230 V/ 60A<br>COLD START at 230V | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                                           | I=43.6A/ 230VAC<br>T50=90us    |

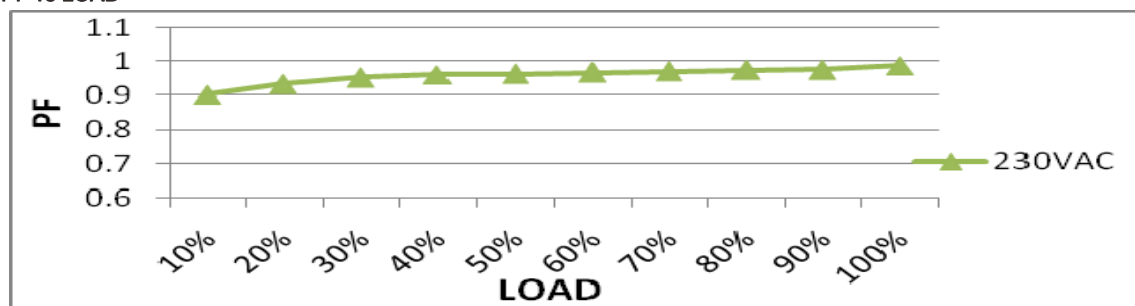
INPUT=230VAC/50HZ @ FULL LOAD

CH1: Input current CH2: AC Input Voltage



|   |              |                         |                                            |                              |
|---|--------------|-------------------------|--------------------------------------------|------------------------------|
| 6 | POWER FACTOR | 0.95/ 230VAC@ FULL LOAD | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C | PF=0.978 @ FULL LOAD /230VAC |
|---|--------------|-------------------------|--------------------------------------------|------------------------------|

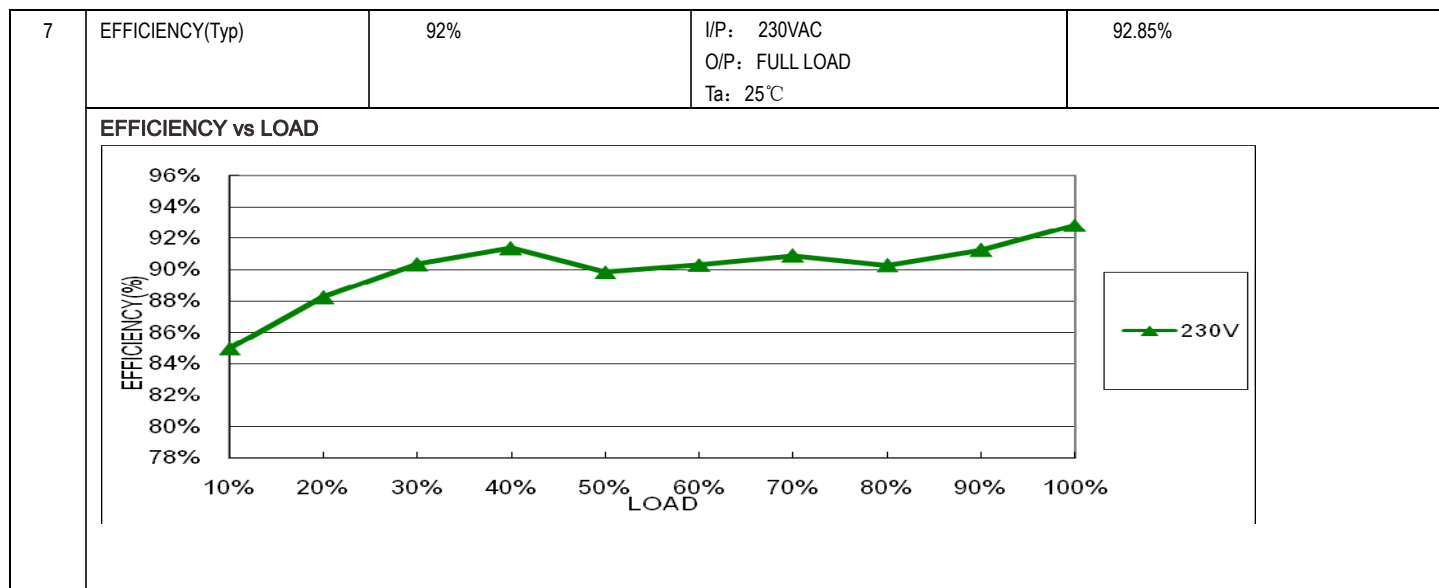
PF vs LOAD





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## CSP-3000 series

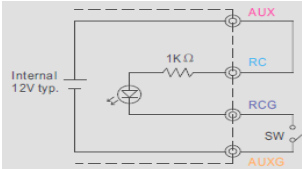
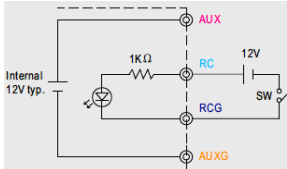
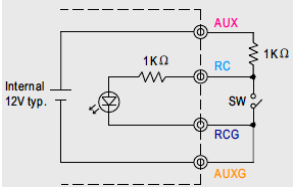
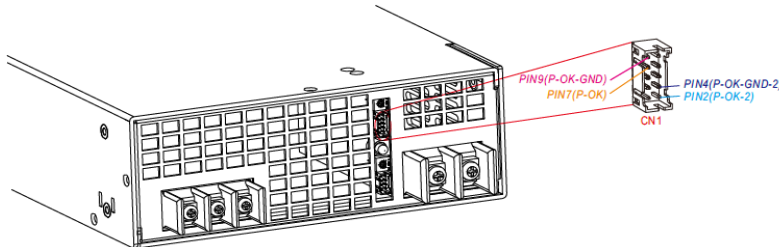
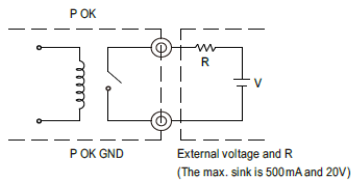
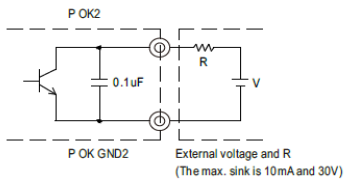


### PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                          | TEST CONDITION                                                     | RESULT                                                                                                                |
|----|-----------------------------|----------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 1  | OVER VOLTAGE PROTECTION     | 127V~150V                              | I/P: 230VAC<br>O/P: TESTING                                        | 139.8V/ 230VAC<br>Shut down o/p voltage, re-power on to recovery                                                      |
| 2  | OVER LOAD PROTECTION        | 105%~120%(Typ)                         | I/P: 180VAC<br>I/P: 230VAC<br>I/P: 264VAC<br>O/P: TESTING Ta: 25°C | 115.76%/ 180VAC<br>119.2%/ 230VAC<br>116.1%/ 264VAC<br>continuous constant current limiting                           |
| 3  | OVER TEMPERATURE PROTECTION | NO DAMAGE                              | I/P: 180VAC<br>I/P: 264VAC<br>O/P: FULL LOAD                       | O.T.P. Active<br>Shut down o/p voltage, recovers automatically after temperature goes down or re-power on to recovery |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 180VAC<br>I/P: 264VAC<br>O/P: FULL LOAD<br>Ta: 25°C           | NO DAMAGE<br>Shut down and latch off o/p voltage, re-power on to recovery                                             |

### CONTROL FUNCTION TEST

| NO | TEST ITEM            | SPECIFICATION | TEST CONDITION                          | RESULT |
|----|----------------------|---------------|-----------------------------------------|--------|
| 1  | AUXILIARY POWER(AUX) | 12V@0.4A      | I/P: 230 VAC<br>O/P:FULLLOAD<br>Ta:25°C | PASS   |

| 2                 | REMOTE CONTROL<br>ON-OFF                                                                                          | <p>I/P:230VAC Rc+/Rc-<br/>O/P:FULL LOA /NO LOAD</p> <table border="1"> <thead> <tr> <th>Connection method</th><th>Example2.2(A)</th><th>Example2.2(B)</th><th>Example2.2(C)</th></tr> </thead> <tbody> <tr> <td>SW Logic</td><td></td><td></td><td></td></tr> <tr> <td>Output ON</td><td>SW OPEN</td><td>SW OPEN</td><td>SW CLOSE</td></tr> <tr> <td>Output OFF</td><td>SW CLOSE</td><td>SW CLOSE</td><td>SW OPEN</td></tr> </tbody> </table> <p>1、Example 2.2(A):<br/> </p> <p>2、Example 2.2(B):<br/> </p> <p>3、Example 2.2(C):<br/> </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Connection method                                  | Example2.2(A) | Example2.2(B)                        | Example2.2(C)                      | SW Logic |                                                                                                       |                         |                        | Output ON                                                                                                         | SW OPEN                                             | SW OPEN                                            | SW CLOSE | Output OFF | SW CLOSE | SW CLOSE | SW OPEN | PASS |
|-------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------|--------------------------------------|------------------------------------|----------|-------------------------------------------------------------------------------------------------------|-------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------|----------|------------|----------|----------|---------|------|
| Connection method | Example2.2(A)                                                                                                     | Example2.2(B)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Example2.2(C)                                      |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |
| SW Logic          |                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                    |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |
| Output ON         | SW OPEN                                                                                                           | SW OPEN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SW CLOSE                                           |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |
| Output OFF        | SW CLOSE                                                                                                          | SW CLOSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SW OPEN                                            |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |
| 3                 | CURRENT SHARING                                                                                                   | PSU1-PSU2 -P<br>SU3 < 10%<br><br>I/P: 230 VAC<br>O/P: FULL/50% LOAD<br>Ta: 25℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PASS                                               |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |
| 4                 | ALARM SIGNAL OUTPUT                                                                                               | <p>I/P:230VAC O/P:FULL LOAD Ta:25℃<br/>           ※ Alarm signal is sent out through "P OK" &amp; "P OK GND" and P OK2 &amp; P OK2 GND2 pins on CN1. Please acknowledge an external voltage source is required for this function</p>  <table border="1"> <thead> <tr> <th>Function</th><th>Description</th><th>Output of alarm(P OK, Relay Contact)</th><th>Output of alarm(P OK2, TTL Signal)</th></tr> </thead> <tbody> <tr> <td rowspan="2">P OK</td><td>The signal is "Low" when the power supply is above 80% of the rated output voltage, or, say, Power OK</td><td>Low (0.5V max at 500mA)</td><td>Low (0.5V max at 10mA)</td></tr> <tr> <td>The signal turns to be "High" when the power supply is under 80% of the rated output voltage, or, say, Power Fail</td><td>High or open (External applied voltage, 500mA max.)</td><td>High or open (External applied voltage, 10mA max.)</td></tr> </tbody> </table> <p>Table 3.1 Explanation of alarm</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="411 1630 762 1809">  <p>Fig. 3.2 Internal circuit of P OK (Relay, total is 10W)</p> </div> <div data-bbox="890 1630 1241 1809">  <p>Fig. 3.3 Internal circuit of P OK2 (Open collector method)</p> </div> </div> <p>1、ALARM SIGNAL OUTPUT<br/>           High (*~*V) : When the Vout ≤ 80%±5%.<br/>           Low (*~*V) : When Vout ≥ 80%±5%.</p> <p>I/P: 230 VAC<br/>O/P:FULL LOAD<br/>Ta:25℃</p> | Function                                           | Description   | Output of alarm(P OK, Relay Contact) | Output of alarm(P OK2, TTL Signal) | P OK     | The signal is "Low" when the power supply is above 80% of the rated output voltage, or, say, Power OK | Low (0.5V max at 500mA) | Low (0.5V max at 10mA) | The signal turns to be "High" when the power supply is under 80% of the rated output voltage, or, say, Power Fail | High or open (External applied voltage, 500mA max.) | High or open (External applied voltage, 10mA max.) |          |            |          |          |         |      |
| Function          | Description                                                                                                       | Output of alarm(P OK, Relay Contact)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Output of alarm(P OK2, TTL Signal)                 |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |
| P OK              | The signal is "Low" when the power supply is above 80% of the rated output voltage, or, say, Power OK             | Low (0.5V max at 500mA)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Low (0.5V max at 10mA)                             |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |
|                   | The signal turns to be "High" when the power supply is under 80% of the rated output voltage, or, say, Power Fail | High or open (External applied voltage, 500mA max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | High or open (External applied voltage, 10mA max.) |               |                                      |                                    |          |                                                                                                       |                         |                        |                                                                                                                   |                                                     |                                                    |          |            |          |          |         |      |

## 1、FULL LOAD P OK

| Vout                             | ALARM SIGNAL OUTPUT |
|----------------------------------|---------------------|
| High $V_{out} \leq 80\% \pm 5\%$ | 87 V/72.5%          |
| Low $V_{out} \geq 80\% \pm 5\%$  | 120V/100%           |

## 2、FULL LOAD P OK2

| Vout                             | ALARM SIGNAL OUTPUT |
|----------------------------------|---------------------|
| High $V_{out} \leq 80\% \pm 5\%$ | 79 V/65.8%          |
| Low $V_{out} \geq 80\% \pm 5\%$  | 120V/100%           |

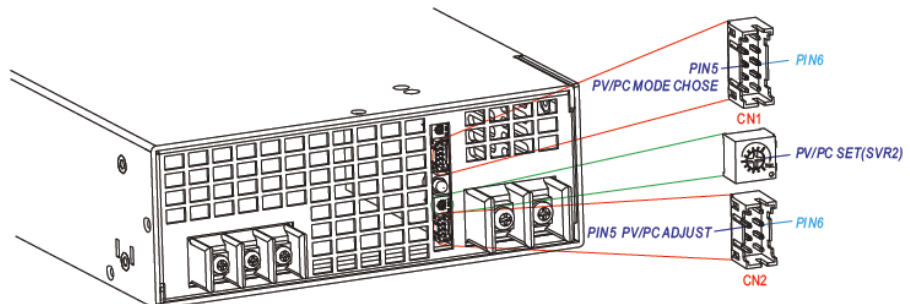
## OUTPUT VOLTAGE/CURRENT PROGRAMMABLE

### 1. Output Voltage/Current Programming

#### ※ Mode Setting

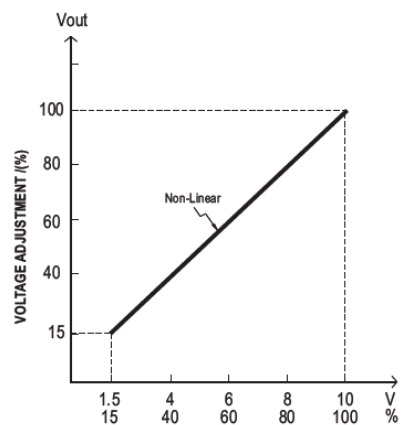
| CN1:      | CONDITION | MODE    | FUNCTION                   |
|-----------|-----------|---------|----------------------------|
| PIN5/PIN6 | SHORT     | PV MODE | Output Voltage Programming |
|           | OPEN      | PC MODE | Output Current Programming |

※ The factory default settings: PV mode output max voltage pin5/pin6 short by jumper cap.  
When pull out the jumper cap, the default settings: PC mode output max constant current.

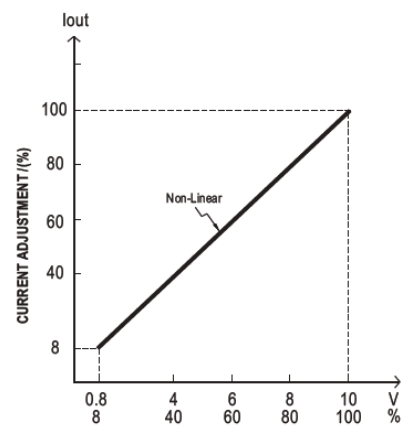


#### ※ PV/PC Set adjustment

- ◎ Adjust the resistance(SVR2) can set output voltage or constant current point, the adjusting range is 20%-100% of max voltage or max constant current point.
- ◎ In the CN2, pin5/pin6 access external 10V voltage signal or 500-1KHz PWM signal can adjust the output voltage or constant current point.



PIN5/PIN6 ACCESS TO EXTERNAL VOLTAGE SIGNALS(DC/PWM)



PIN5/PIN6 ACCESS TO EXTERNAL VOLTAGE SIGNALS(DC/PWM)

| MODEL    | 120V            | 250V              | 400V            |
|----------|-----------------|-------------------|-----------------|
| PV range | 18 ~ 120V(max.) | 37.5 ~ 250V(max.) | 60 ~ 400V(max.) |
| PC range | 2.4 ~ 30A(max.) | 1.4~ 17A(max.)    | 0.8 ~ 10A(max.) |

I/P: 230 VAC

O/P: FULL LOAD

Ta: 25°C

TEST RESULT: OK

## 1. FULL LOAD

| PV<br>MODEL | 1.5V    | 4V      | 6V      | 8V      | 10V      |
|-------------|---------|---------|---------|---------|----------|
| SPEC        | 15%V±5% | 40%V±5% | 60%V±5% | 80%V±5% | 100%V±5% |
| Vout        | 15.08%  | 41.83%  | 62.26%  | 82.67%  | 101.17%  |

| PV<br>MODEL | 15%     | 40%     | 60%     | 80%     | 100%     |
|-------------|---------|---------|---------|---------|----------|
| SPEC        | 15%V±5% | 40%V±5% | 60%V±5% | 80%V±5% | 100%V±5% |
| Vout        | 15.09%  | 40.5%   | 60.33%  | 80.33%  | 101.17%  |

## 2. FULL LOAD

| PC<br>MODEL      | 0.8V   | 4V      | 6V      | 8V      | 10V      |
|------------------|--------|---------|---------|---------|----------|
| SPEC             | 8%I±5% | 40%I±5% | 60%I±5% | 80%I±5% | 100%I±5% |
| I <sub>max</sub> | 7.66%  | 41.74%  | 61.86%  | 82.07%  | 100.43%  |

| PC<br>MODEL      | 8%     | 40%     | 60%     | 80%     | 100%     |
|------------------|--------|---------|---------|---------|----------|
| SPEC             | 8%I±5% | 40%I±5% | 60%I±5% | 80%I±5% | 100%I±5% |
| I <sub>max</sub> | 7.89%  | 40.34%  | 59.78%  | 79.32%  | 100.02%  |

## COMPONENT STRESS TEST

| NO | TEST ITEM                                           | SPECIFICATION         | TEST CONDITION                                                                                                                                                                                                                                                                                                                     | RESULT                                                                                                       |
|----|-----------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1  | PWM Transistor<br>(D to S) or (C to E) Peak Voltage | Q51 Rated<br>50A/600V | I/P: High-Line +3V =267V<br>O/P: (1) Full Load Turn on<br>(2) Output Short<br>(3) Dynamic Load Full Load/<br>Min. Load 75%Duty/120Hz<br>(4) Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(5) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6) 200% Load<br>(7) NO Load<br>(8) VOLTAGE PROGRAMMABLE<br>(PV) 20%/60% | (1) 496V<br>(2) 532V<br>(3) 485V<br>(4) 488V<br>(5) 488V<br>(6) 533V<br>(7) 500V<br>(8) 20% 496V<br>60% 498V |
| 2  | PFC Transistor                                      | Q1 Rated<br>52A/600V  | I/P: High-Line +3V =267V<br>O/P: (1) Full Load Turn on<br>(2) Output Short<br>(3) Dynamic Load Full Load/<br>Min. Load 75%Duty/120Hz<br>(4) Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(5) Dynamic Load Full Load/                                                                                                       | (1) 496V<br>(2) 436V<br>(3) 500V<br>(4) 496V<br>(5) 496V<br>(6) 438V<br>(7) 441V<br>(8) 20% 452V             |



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## CSP-3000 series

|   |                         |                                |                                                                                                                                                                                                                                                                                                                                  |                                                                                                           |
|---|-------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|   |                         |                                | Min. Load 90%Duty/5KHz<br>(6) 200% Load<br>(7) NO Load<br>(8) VOLTAGE PROGRAMMABLE<br>(PV) 20%/60%                                                                                                                                                                                                                               | 60%473V                                                                                                   |
| 3 | CLAMP Diode             | D38 Rated<br>8A/ 600 V         | I/P: High-Line +3V =267V<br>O/P: (1) Full Load Turn on<br>(2) Output Short<br>(3)Dynamic Load Full Load/<br>Min. Load 75%Duty/120Hz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(5) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6) 200% Load<br>(7) NO Load<br>(8) VOLTAGE PROGRAMMABLE<br>(PV) 20%/60% | (1) 432V<br>(2) 460V<br>(3) 436V<br>(4)448V<br>(5) 446V<br>(6) 460V<br>(7) 444V<br>(8) 20%415V<br>60%426V |
| 4 | Diode Peak Voltage      | D100 Rated<br>30A/600V         | I/P: High-Line +3V =267V<br>O/P: (1) Full Load Turn on<br>(2) Output Short<br>(3)Dynamic Load Full Load/<br>Min. Load 75%Duty/120Hz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(5) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6) 200% Load<br>(7) NO Load<br>(8) VOLTAGE PROGRAMMABLE<br>(PV) 20%/60% | (1) 432V<br>(2) 460V<br>(3) 436V<br>(4)448V<br>(5) 446V<br>(6) 460V<br>(7) 444V<br>(8) 20%415V<br>60%426V |
| 5 | Input Capacitor Voltage | C5 Rated:<br>560 $\mu$ / 420 V | I/P: High-Line +3V =308 V<br>O/P: (1)Full Load input on/off<br>(2) Min load input on /Off<br>(3)Full Load /Min load Change<br>(4)Full load BURN-IN 1H<br>Ta: 25°C                                                                                                                                                                | (1)396V<br>(2)388V<br>(3)401V<br>(4)396V                                                                  |
| 6 | Control IC Voltage Test | U5 Rated<br>17 V               | I/P: High-Line +3V =308V<br>O/P:(1)Full Load Input On/Off<br>(2) Output Short<br>(3)O.L.P<br>(4)O.V.P.<br>(5)NO LOAD VR 下限.LOW<br>LINE<br>(6) CV 下限<br>(7)VOLTAGE<br>PROGRAMMABLE<br>20%/60%                                                                                                                                     | (1) 14.1V<br>(2) 15.1V<br>(3) 14.5V<br>(4)14.0V<br>(5) 13.8V<br>(6) 14.3V<br>(7) 20%14.9V<br>60%14.5V     |

## SAFETY TEST

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



## 3000W Power Supply with Single Output

## CSP-3000 series

|   |                      |                                                                       |                                                                                  |                                                                       |
|---|----------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 1 | WITHSTAND VOLTAGE    | I/P-O/P: 3.0KVAC/min<br>I/P-FG: 2 KVAC/min<br>O/P-FG: 0.5KVAC/min     | I/P-O/P: 3.6 KVAC/min<br>I/P-FG: 2.4KVAC/min<br>O/P-FG: 0.6 KVAC/min<br>Ta: 25°C | I/P-O/P: 3.45mA<br>I/P-FG: 3.15mA<br>O/P-FG: 3.085mA<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°C               | I/P-O/P: >3200MΩ<br>I/P-FG: >4400 MΩ<br>O/P-FG: >9999M Ω<br>NO DAMAGE |
| 3 | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                                | 40A / 2min<br>Ta:25°C                                                            | 2mΩ                                                                   |

### E.M.C TEST

| NO | TEST ITEM                                                                                                                       | SPECIFICATION                                             | TEST CONDITION                                  | RESULT                        |
|----|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------|-------------------------------|
| 1  | HARMONIC                                                                                                                        | EN61000-3-2                                               | I/P: 230VAC/50HZ<br>O/P: FULL LOAD<br>Ta: 25°C  | PASS                          |
| 2  | CONDUCTION                                                                                                                      | EN55032<br>CLASS A                                        | I/P: 230 VAC/50HZ<br>O/P: FULL LOAD<br>Ta: 25°C | PASS<br>Test by certified Lab |
| 3  | RADIATION                                                                                                                       | EN55032<br>CLASS A                                        | I/P: 230 VAC/50HZ<br>O/P: FULL LOAD<br>Ta: 25°C | PASS<br>Test by certified Lab |
| 4  | E.S.D                                                                                                                           | EN61000-4-2<br>LIGHT INDUSTRY<br>Air: 8KV<br>Contact: 4KV | I/P: 230 VAC/50HZ<br>O/P: FULL LOAD<br>Ta: 25°C | CRITERIA A                    |
| 5  | E.F.T                                                                                                                           | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT: 2KV               | I/P: 230VAC/50HZ<br>O/P: FULL LOAD<br>Ta: 25°C  | CRITERIA A                    |
| 6  | SURGE                                                                                                                           | EN61000-4-5<br>LIGHT INDUSTRY<br>L-N : 1KV<br>L-PE: 2KV   | I/P: 230VAC/50HZ<br>O/P: FULL LOAD<br>Ta: 25°C  | CRITERIA A                    |
| 7  | Test by certified Lab & Test Report Prepare. Any contradictions of the test results please refer to the latest EMC test report. |                                                           |                                                 |                               |

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

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

| 1  | TEMPERATURE RISE TEST                                             | MODEL: CSP-3000-120<br>1. ROOM AMBIENT BURN-IN: 2 HRS<br>I/P: 230VAC O/P: FULL LOAD Ta= 33.5℃<br>2. HIGH AMBIENT BURN-IN: 2 HRS<br>I/P: 230VAC O/P: FULL LOAD Ta=51.2℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                               |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|----|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------|----|----------|-------------------------|------------------------|---|-----|-------|-------|---|------|-------|-------|---|------|-------|-------|---|-----|-------|-------|---|----|-------|-------|---|-----|-------|-------|---|----|-------|-------|---|----|-------|-------|---|----|-------|-------|----|----|-------|-------|----|----|-------|-------|----|----|-------|-------|----|-----|-------|-------|----|-----|-------|-------|----|-----|-------|-------|----|----|-------|-------|----|-----|-------|-------|----|----|-------|-------|----|-----|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|-----|-------|-------|----|----|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|----|-------|-------|
|    |                                                                   | <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 33.5 ℃</th><th>HIGH AMBIENT Ta=51.2 ℃</th></tr><tr><td>1</td><td>LF2</td><td>73.6℃</td><td>91.2℃</td></tr><tr><td>2</td><td>RTH1</td><td>48.8℃</td><td>64.9℃</td></tr><tr><td>3</td><td>ZNR2</td><td>45.9℃</td><td>61.8℃</td></tr><tr><td>4</td><td>BD1</td><td>66.7℃</td><td>82.2℃</td></tr><tr><td>5</td><td>L1</td><td>60.4℃</td><td>76.4℃</td></tr><tr><td>6</td><td>RY1</td><td>52.8℃</td><td>68.4℃</td></tr><tr><td>7</td><td>C9</td><td>56.9℃</td><td>71.4℃</td></tr><tr><td>8</td><td>C5</td><td>53.6℃</td><td>70.6℃</td></tr><tr><td>9</td><td>Q1</td><td>78.0℃</td><td>97.3℃</td></tr><tr><td>10</td><td>D2</td><td>80.7℃</td><td>99.1℃</td></tr><tr><td>11</td><td>Q3</td><td>69.2℃</td><td>87.7℃</td></tr><tr><td>12</td><td>U1</td><td>57.1℃</td><td>74.6℃</td></tr><tr><td>13</td><td>D37</td><td>58.4℃</td><td>75.3℃</td></tr><tr><td>14</td><td>C87</td><td>70.9℃</td><td>89.1℃</td></tr><tr><td>15</td><td>Q10</td><td>63.7℃</td><td>81.1℃</td></tr><tr><td>16</td><td>T4</td><td>73.2℃</td><td>91.6℃</td></tr><tr><td>17</td><td>Q53</td><td>72.7℃</td><td>92.8℃</td></tr><tr><td>18</td><td>T5</td><td>73.9℃</td><td>93.9℃</td></tr><tr><td>19</td><td>U12</td><td>57.3℃</td><td>74.1℃</td></tr><tr><td>20</td><td>D104</td><td>77.0℃</td><td>90.6℃</td></tr><tr><td>21</td><td>D106</td><td>38.8℃</td><td>86.6℃</td></tr><tr><td>22</td><td>L101</td><td>61.3℃</td><td>75.8℃</td></tr><tr><td>23</td><td>C115</td><td>56.9℃</td><td>72.1℃</td></tr><tr><td>24</td><td>C120</td><td>62.1℃</td><td>79.0℃</td></tr><tr><td>25</td><td>C306</td><td>63.4℃</td><td>79.8℃</td></tr><tr><td>26</td><td>D301</td><td>75.1℃</td><td>91.0℃</td></tr><tr><td>27</td><td>RG1</td><td>78.4℃</td><td>91.2℃</td></tr><tr><td>28</td><td>U5</td><td>58.1℃</td><td>73.8℃</td></tr><tr><td>29</td><td>U900</td><td>50.4℃</td><td>68.9℃</td></tr><tr><td>30</td><td>U530</td><td>54.3℃</td><td>70.7℃</td></tr><tr><td>31</td><td>Q702</td><td>63.3℃</td><td>77.0℃</td></tr><tr><td>32</td><td>RTH3</td><td>59.8℃</td><td>77.9℃</td></tr><tr><td>33</td><td>TSW1</td><td>58.2℃</td><td>76.1℃</td></tr><tr><td>34</td><td>U500</td><td>60.1℃</td><td>77.1℃</td></tr><tr><td>35</td><td>TC</td><td>40.5℃</td><td>56.6℃</td></tr></table> |                                                               |                   | NO | Position | ROOM AMBIENT Ta= 33.5 ℃ | HIGH AMBIENT Ta=51.2 ℃ | 1 | LF2 | 73.6℃ | 91.2℃ | 2 | RTH1 | 48.8℃ | 64.9℃ | 3 | ZNR2 | 45.9℃ | 61.8℃ | 4 | BD1 | 66.7℃ | 82.2℃ | 5 | L1 | 60.4℃ | 76.4℃ | 6 | RY1 | 52.8℃ | 68.4℃ | 7 | C9 | 56.9℃ | 71.4℃ | 8 | C5 | 53.6℃ | 70.6℃ | 9 | Q1 | 78.0℃ | 97.3℃ | 10 | D2 | 80.7℃ | 99.1℃ | 11 | Q3 | 69.2℃ | 87.7℃ | 12 | U1 | 57.1℃ | 74.6℃ | 13 | D37 | 58.4℃ | 75.3℃ | 14 | C87 | 70.9℃ | 89.1℃ | 15 | Q10 | 63.7℃ | 81.1℃ | 16 | T4 | 73.2℃ | 91.6℃ | 17 | Q53 | 72.7℃ | 92.8℃ | 18 | T5 | 73.9℃ | 93.9℃ | 19 | U12 | 57.3℃ | 74.1℃ | 20 | D104 | 77.0℃ | 90.6℃ | 21 | D106 | 38.8℃ | 86.6℃ | 22 | L101 | 61.3℃ | 75.8℃ | 23 | C115 | 56.9℃ | 72.1℃ | 24 | C120 | 62.1℃ | 79.0℃ | 25 | C306 | 63.4℃ | 79.8℃ | 26 | D301 | 75.1℃ | 91.0℃ | 27 | RG1 | 78.4℃ | 91.2℃ | 28 | U5 | 58.1℃ | 73.8℃ | 29 | U900 | 50.4℃ | 68.9℃ | 30 | U530 | 54.3℃ | 70.7℃ | 31 | Q702 | 63.3℃ | 77.0℃ | 32 | RTH3 | 59.8℃ | 77.9℃ | 33 | TSW1 | 58.2℃ | 76.1℃ | 34 | U500 | 60.1℃ | 77.1℃ | 35 | TC | 40.5℃ | 56.6℃ |
| NO | Position                                                          | ROOM AMBIENT Ta= 33.5 ℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | HIGH AMBIENT Ta=51.2 ℃                                        |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 1  | LF2                                                               | 73.6℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 91.2℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 2  | RTH1                                                              | 48.8℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 64.9℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 3  | ZNR2                                                              | 45.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 61.8℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 4  | BD1                                                               | 66.7℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 82.2℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 5  | L1                                                                | 60.4℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 76.4℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 6  | RY1                                                               | 52.8℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 68.4℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 7  | C9                                                                | 56.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 71.4℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 8  | C5                                                                | 53.6℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 70.6℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 9  | Q1                                                                | 78.0℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 97.3℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 10 | D2                                                                | 80.7℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 99.1℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 11 | Q3                                                                | 69.2℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 87.7℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 12 | U1                                                                | 57.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 74.6℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 13 | D37                                                               | 58.4℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 75.3℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 14 | C87                                                               | 70.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 89.1℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 15 | Q10                                                               | 63.7℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 81.1℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 16 | T4                                                                | 73.2℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 91.6℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 17 | Q53                                                               | 72.7℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 92.8℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 18 | T5                                                                | 73.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 93.9℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 19 | U12                                                               | 57.3℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 74.1℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 20 | D104                                                              | 77.0℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 90.6℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 21 | D106                                                              | 38.8℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 86.6℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 22 | L101                                                              | 61.3℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 75.8℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 23 | C115                                                              | 56.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 72.1℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 24 | C120                                                              | 62.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 79.0℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 25 | C306                                                              | 63.4℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 79.8℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 26 | D301                                                              | 75.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 91.0℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 27 | RG1                                                               | 78.4℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 91.2℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 28 | U5                                                                | 58.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 73.8℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 29 | U900                                                              | 50.4℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 68.9℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 30 | U530                                                              | 54.3℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 70.7℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 31 | Q702                                                              | 63.3℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 77.0℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 32 | RTH3                                                              | 59.8℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 77.9℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 33 | TSW1                                                              | 58.2℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 76.1℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 34 | U500                                                              | 60.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 77.1℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 35 | TC                                                                | 40.5℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 56.6℃                                                         |                   |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 2  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | I/P: 264VAC/180VAC<br>O/P: FULL LOAD<br>Ta= -25℃              | 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 ℃<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | I/P: 272VAC<br>O/P: FULL LOAD<br>Ta=50 ℃<br>HUMIDITY= 95% R.H | TEST: OK          |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 4  | TEMPERATURE<br>COEFFICIENT                                        | ±0.05%/℃ (0~50℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | I/P: 230 VAC<br>O/P: FULL LOAD                                | ±0.004%/℃ (0~50℃) |    |          |                         |                        |   |     |       |       |   |      |       |       |   |      |       |       |   |     |       |       |   |    |       |       |   |     |       |       |   |    |       |       |   |    |       |       |   |    |       |       |    |    |       |       |    |    |       |       |    |    |       |       |    |     |       |       |    |     |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |    |       |       |    |     |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |     |       |       |    |    |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |



## 3000W Power Supply with Single Output

## CSP-3000 series

|    |                          |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                          |  |
|----|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 5  | STORAGE TEMPERATURE TEST | -40~+85℃                                                                                                                                                                                                                                                                    | 1. Thermal shock Temperature: -45℃~ +90℃<br>2. Temperature change rate : 25℃ / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle: 10CYCLE<br>5. Input/Output condition:                                                                                                                 |  |
| 6  | THERMAL SHOCK TEST       | -20~+50℃                                                                                                                                                                                                                                                                    | 1. Thermal shock Temperature: -25℃~ +55℃<br>2. Temperature change rate : 25℃ / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle: 16CYCLE<br>5. Input/Output condition:<br>15cycle:230VAC/ FULL LOAD AC on 3 sec/AC off 1 sec TEST<br>1cycle:230VAC/ FULL LOAD Burn In Test<br>TEST: OK |  |
| 7  | VIBRATION TEST           | 10~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes                                                                                                                                                                                                      | 1 Carton & 1 Set<br>(1) Waveform: Sine Wave<br>(2) Frequency: 10~500Hz<br>(3) Sweep Time: 10min/sweep cycle<br>(4) Acceleration: 3G<br>(5) Test Time: 180min in each axis (X.Y.Z)<br>(6) Ta: 25℃                                                                                                                         |  |
| 8  | CAPACITOR LIFE CYCLE     | CSP-3000-120: SUPPOSE C115 IS THE MOST CRITICAL COMPONENT<br>(1) I/P: 230VAC O/P: FULL LOAD Ta= 25 ℃ LIFE TIME<br>(2) I/P: 230VAC O/P: FULL LOAD Ta= 50 ℃ LIFE TIME<br>(3) I/P: 230VAC O/P: 75% LOAD Ta= 50 ℃ LIFE TIME<br>(3) I/P: 230VAC O/P: 50% LOAD Ta= 50 ℃ LIFE TIME | (1) 891878 HRS<br>(2) 190159 HRS<br>(3) 197799 HRS<br>(4) 298771 HRS                                                                                                                                                                                                                                                     |  |
| 9  | MTBF                     | Conducted by Parts Stress Analysis Prediction<br>223.8 K hrs min. Telcordia SR-332 (Bellcore)<br>75.1K hrs min. MIL-HDBK-217F (25℃)                                                                                                                                         |                                                                                                                                                                                                                                                                                                                          |  |
| 10 | Ongoing Reliability Test | I/P: 230VAC O/P: FULL LOAD TA=50℃<br>Demonstration Mean Time Between Failure : 50,000 hours                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                          |  |

| TEST RESULT | TESTER     | REVIEW | APPROVAL |
|-------------|------------|--------|----------|
| PASS        | WUWQ/ZHOUB | WENF   | LIUWY    |