



# Test Report: BIC-5K-48

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AC⇔DC 5KW Bidirectional Power Supply with Energy Recycle

## ■ DESIGN VERIFY TEST

Output Function Test (AC to DC)

Input Function Test (AC to DC)

Input Function Test (DC to AC)

Output Function Test (DC to AC)

Protection Function Test

Control Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

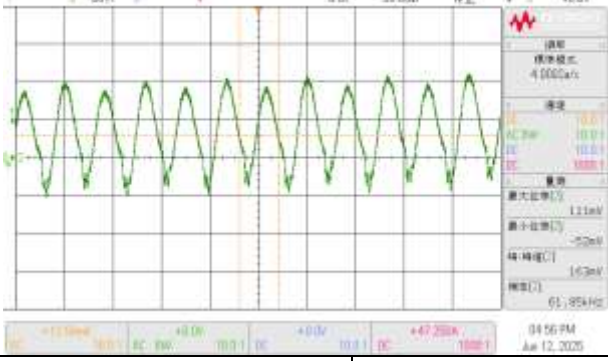
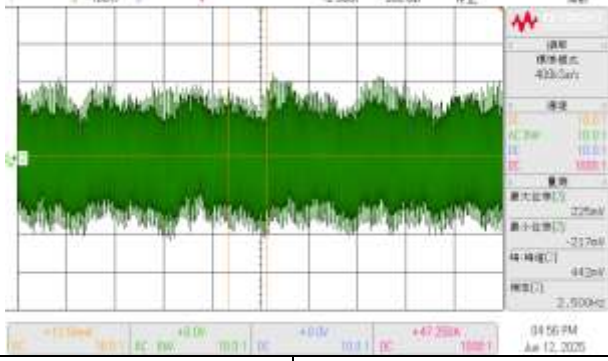
E.M.C. Test

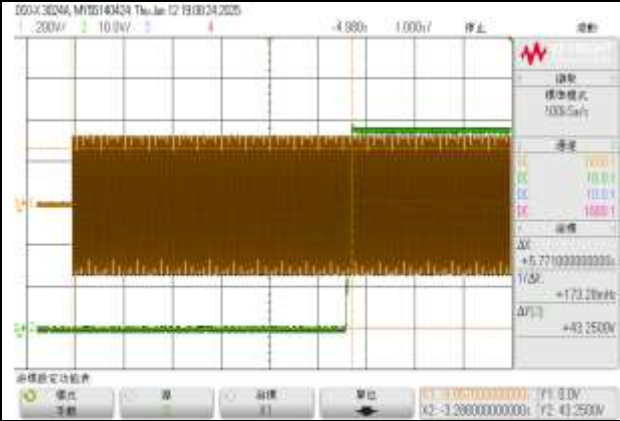
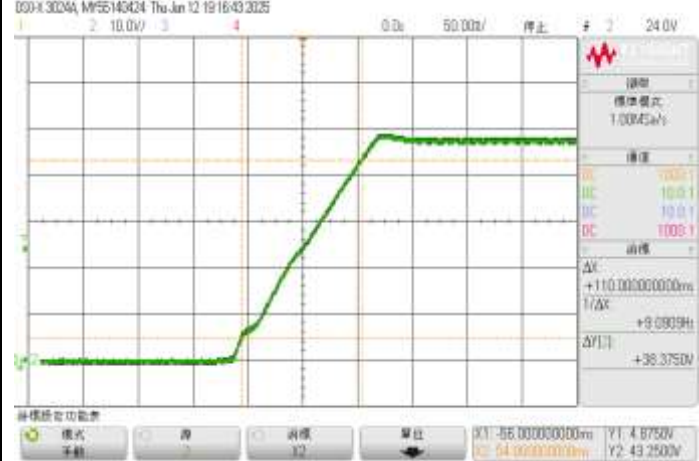
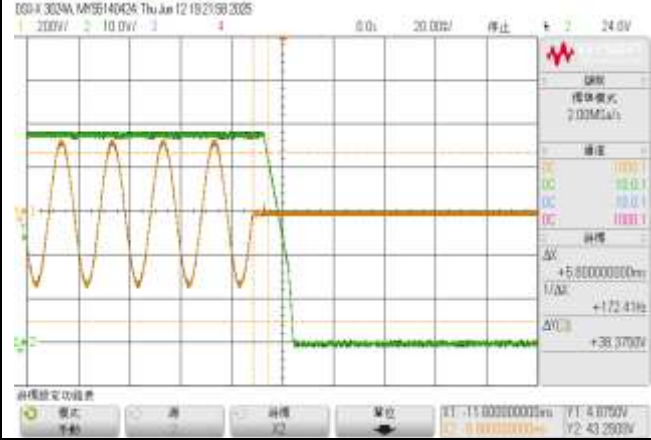
## ■ RELIABILITY TEST

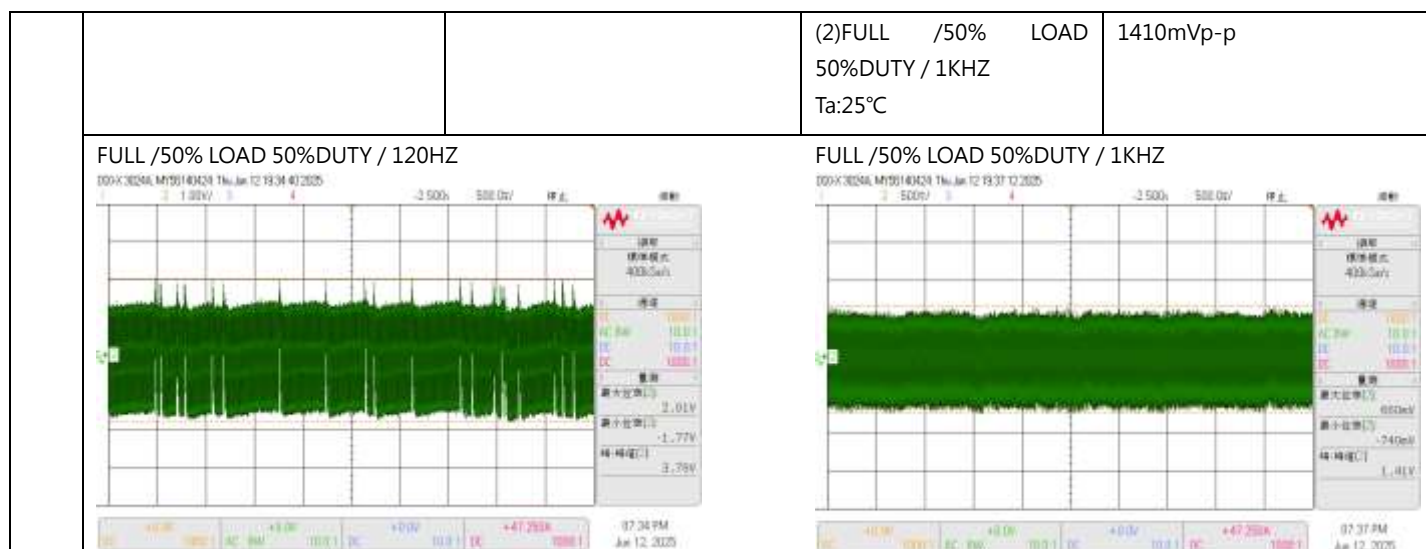
ENVIRONMENT TEST

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST (AC to DC)

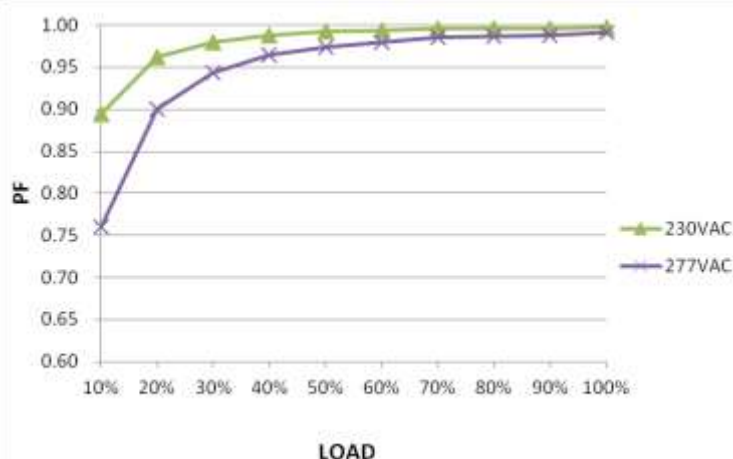
| NO                                                                           | TEST ITEM                      | SPECIFICATION                                                                        | TEST CONDITION                                                | RESULT                                                          |
|------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|
| 1                                                                            | OUTPUT VOLTAGE<br>ADJUST RANGE | CH1: 38 V~ 66V                                                                       | I/P : 230 VAC<br>I/P : 180 VAC<br>O/P : MIN LOAD<br>Ta : 25°C | 37.982V~65.88V / 230VAC<br>38.001V~65.88V / 180VAC              |
| 2                                                                            | OUTPUT VOLTAGE<br>TOLERANCE    | V1: 2% ~ 2%                                                                          | I/P: 180VAC /305VAC<br>O/P:FULL/ MIN. LOAD<br>Ta:25°C         | V1: -0.06% ~ 0.125%<br>180: 48.05V/48.06V<br>305: 48.05V/48.06V |
| 3                                                                            | LINE REGULATION                | V1: 1%~ -1%                                                                          | I/P: 200VAC~ 305VAC<br>O/P:FULL LOAD<br>Ta:25°C               | V1: 0.31 % ~ 0.13%<br>200V : 48.05V<br>305V : 48.06V            |
| 4                                                                            | LOAD REGULATION                | V1: 1%~ -1%                                                                          | I/P: 230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C                  | V1: 0.02%~ 0.04%<br>48.03 / 48.05 / 48.04                       |
| 5                                                                            | OVER/UNDERSHOOT TEST           | <± 10%                                                                               | I/P: 230VAC<br>O/P:FULL LOAD<br>Ta:25°C                       | 4.77% /- 5.02%                                                  |
| 6                                                                            | RIPPLE & NOISE (Max )          | V1: 600mVp-p                                                                         | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C                        | V1: 442mVp-p                                                    |
| high frequency :                                                             |                                |   |                                                               |                                                                 |
| low frequency :                                                              |                                |  |                                                               |                                                                 |
| 7                                                                            | SET UP TIME(Max)               | 230VAC/8sec                                                                          | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                 | 230VAC/ 5.77sec                                                 |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1 : Output Voltage CH2 : AC Input Voltage |                                |                                                                                      |                                                               |                                                                 |

|                                                                                                                                                                     |                     |                                                                                   |                                                             |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------|----------------|
|                                                                                                                                                                     |                     |  |                                                             |                |
| 8                                                                                                                                                                   | RISE TIME (Max)     | 230VAC/150ms                                                                      | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C               | 230VAC / 110ms |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1 : Output Voltage<br>                         |                     |                                                                                   |                                                             |                |
| 9                                                                                                                                                                   | HOLD UP TIME (Typ.) | 230VAC/--                                                                         | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C               | 230VAC/ 5.8ms  |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1 : Output Voltage CH2 : AC Input Voltage<br> |                     |                                                                                   |                                                             |                |
| 10                                                                                                                                                                  | DYNAMIC LOAD        | V1: 4800mVp-p                                                                     | I/P: 230VAC<br>O/P:<br>(1)FULL /50% LOAD<br>50%DUTY / 120HZ | 3780mVp-p      |



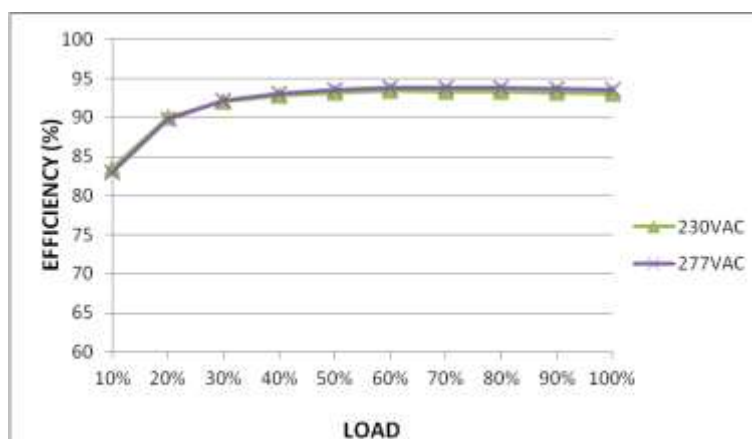
## INPUT FUNCTION TEST(AC to DC)

| NO | TEST ITEM             | SPECIFICATION            | TEST CONDITION                                                                                                                                                         | RESULT        |
|----|-----------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1  | INPUT VOLTAGE RANGE   | 180VAC~305VAC            | I/P : TESTING<br>O/P : FULL LOAD<br>Ta:25°C                                                                                                                            | 165V~305V     |
|    |                       |                          | I/P :<br>LOW-LINE-3V=177 V<br>HIGH-LINE+10V=315V<br>O/P : FULL/MIN LOAD<br>(PLEASE CHECK DERATING CURVE)<br>ON: 30 Sec OFF: 30 Sec 10MIN<br>( POWER ON/OFF NO DAMAGE ) | TEST: Pass    |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE | I/P : 180 VAC ~305 VAC<br>O/P : FULL~MIN LOAD<br>Ta:25°C                                                                                                               | TEST:<br>PASS |
| 3  | POWER FACTOR (Typ.)   | 0.99/ 230VAC             | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                          | PF=0.99       |
|    | P.F vs LOAD           |                          |                                                                                                                                                                        |               |



|   |                  |                  |                                            |        |
|---|------------------|------------------|--------------------------------------------|--------|
| 4 | EFFICIENCY(Typ.) | 92.5% @ 75% Load | I/P : 230 VAC<br>O/P : 75% Load<br>Ta:25°C | 92.68% |
|---|------------------|------------------|--------------------------------------------|--------|

EFFICIENCY vs LOAD

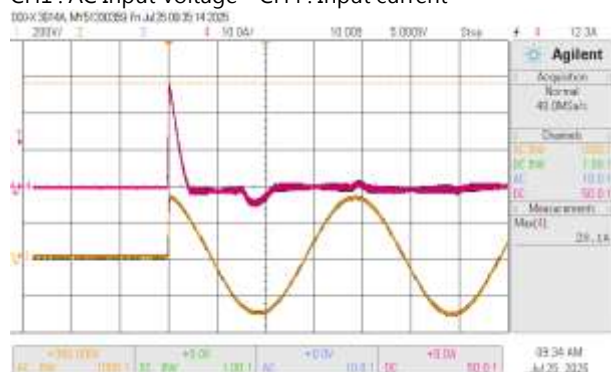


|   |                   |            |                                               |           |
|---|-------------------|------------|-----------------------------------------------|-----------|
| 5 | AC CURRENT (Typ.) | 27A / 230V | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | I =23.43A |
|---|-------------------|------------|-----------------------------------------------|-----------|

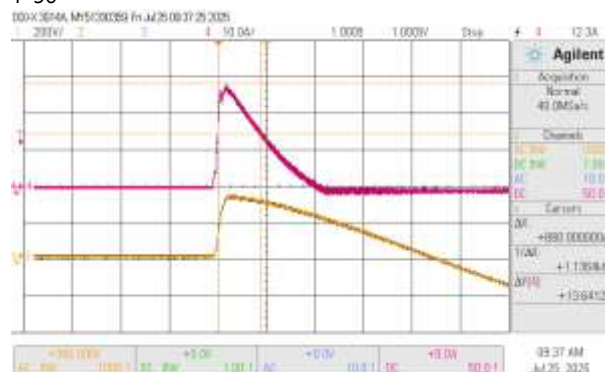
|   |                      |                         |                                               |                       |
|---|----------------------|-------------------------|-----------------------------------------------|-----------------------|
| 6 | INRUSH CURRENT(Typ.) | 120A/230V<br>COLD START | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | I =28.1A<br>T50=880us |
|---|----------------------|-------------------------|-----------------------------------------------|-----------------------|

INPUT=230VAC/50HZ @ FULL LOAD

CH1 : AC Input Voltage CH4 : Input current



T-50





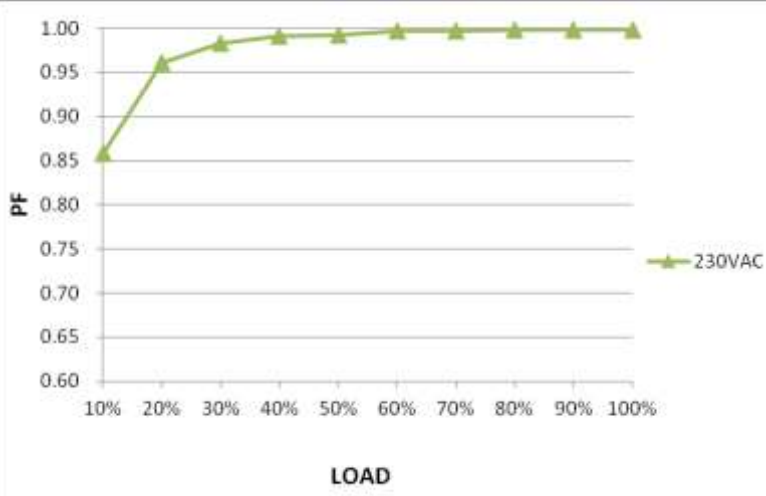
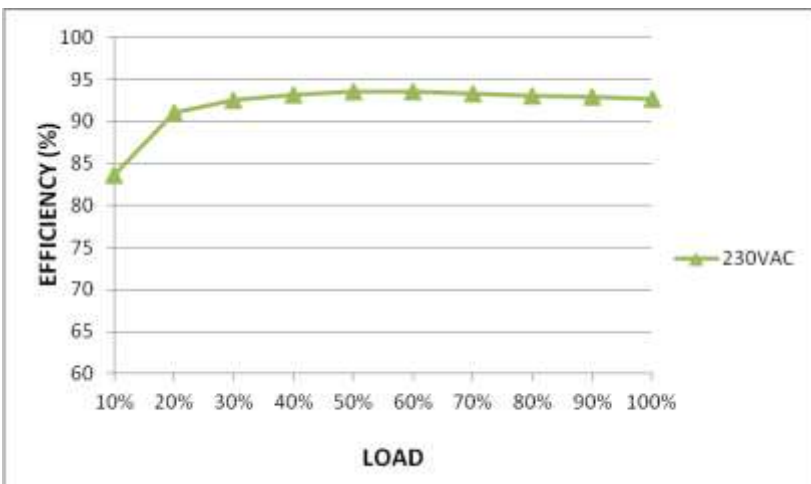
|   |                           |                         |                                                     |                                            |
|---|---------------------------|-------------------------|-----------------------------------------------------|--------------------------------------------|
| 7 | LEAKAGE CURRENT           | < 7.07mA (Peak)/ 305VAC | I/P : 305 VAC / 60Hz<br>O/P : Min LOAD<br>Ta : 25°C | L-FG : 6.48mA(Peak)<br>N-FG : 6.48mA(Peak) |
| 8 | TOTAL HARMONIC DISTORTION | <3%(@load=100%/230VAC)  | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C       | THDi = 2.1%                                |

### INPUT FUNCTION TEST(DC to AC)

| NO | TEST ITEM                | SPECIFICATION | TEST CONDITION                              | RESULT                     |
|----|--------------------------|---------------|---------------------------------------------|----------------------------|
| 1  | RATED INPUT POWER        | 5550W         | I/P : 48VDC<br>O/P : FULL LOAD<br>Ta : 25°C | 5528W                      |
| 2  | FULL POWER VOLTAGE RANGE | 48VDC ~66VDC  | I/P : Test<br>O/P : FULL LOAD<br>Ta : 25°C  | TEST : PASS<br>48VDC~66VDC |
| 3  | DC VOLTAGE RANGE         | 38VDC ~66VDC  | I/P : Test<br>O/P : FULL LOAD<br>Ta : 25°C  | TEST : PASS<br>38VDC~66VDC |
| 4  | INPUT CURRENT (MAX.)     | 115.6A        | I/P : 48VDC<br>O/P : FULL LOAD<br>Ta : 25°C | 113.4A                     |

### OUTPUT FUNCTION TEST(DC to AC)

| NO | TEST ITEM           | SPECIFICATION            | TEST CONDITION                                | RESULT               |
|----|---------------------|--------------------------|-----------------------------------------------|----------------------|
| 1  | RATED OUTPUT POWER  | 5000W                    | I/P : 48VDC<br>O/P : TESTING<br>Ta:25°C       | 5047W                |
| 2  | VOLTAGE RANGE       | 180VAC~305VAC            | I/P : 48VDC<br>O/P : TESTING<br>Ta:25°C       | TEST : 164.7~319.4V  |
| 3  | FREQUENCY RANGE     | 47HZ ~63 HZ<br>NO DAMAGE | I/P : 48VDC<br>O/P : FULL~MIN LOAD<br>Ta:25°C | TEST : 43.0Hz~67.0Hz |
| 4  | AC CURRENT (Typ.)   | 22.5A/ 230VAC            | I/P : 48VDC<br>O/P : FULL LOAD<br>Ta : 25°C   | 22.2A                |
| 5  | POWER FACTOR (Typ.) | 0.99/ 230VAC             | I/P : 48VDC<br>O/P : FULL LOAD<br>Ta : 25°C   | PF=0.998             |
|    | P.F vs LOAD         |                          |                                               |                      |

|   |                           |                                                                                     |                                          |              |
|---|---------------------------|-------------------------------------------------------------------------------------|------------------------------------------|--------------|
|   |                           |   |                                          |              |
| 6 | EFFICIENCY(Typ.)          | 93%                                                                                 | I/P: 48VDC<br>O/P: 75% LOAD<br>Ta:25°C   | 93.2%        |
|   | EFFICIENCY vs LOAD        |  |                                          |              |
| 7 | TOTAL HARMONIC DISTORTION | <3% (@load=100%/230VAC)                                                             | I/P: 48VDC<br>O/P:FULL LOAD<br>Ta : 25°C | THDi = 2.17% |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM            | SPECIFICATION                                                                                                                     | TEST CONDITION                                                                     | RESULT                                                                                                                                                                                   |
|----|----------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | OVER LOAD PROTECTION | 105%~ 115%<br>Constant current limiting, shut down DC O/P voltage 5 sec. after DC O/P voltage is down low, re-power on to recover | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 200VAC<br>I/P: 180VAC<br>O/P:TESTING<br>Ta:25°C | AC to DC (BIC mode)<br>116A 115.38%/ 305VAC<br>116A 115.38% / 230VAC<br>112.8A 108% / 200VAC<br>93A 89.42%/ 180VAC<br>PROTECTION TYPE :<br>Shut down O/P current, re-power on to recover |

|   |                             |                                                                                             |                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
|---|-----------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE                                                      | I/P: 305VAC<br>I/P: 180VAC<br>O/P: FULL LOAD<br>Ta:25°C                                                                               | <b>AC to DC (BIC mode)</b><br>NO DAMAGE<br>PROTECTION TYPE :<br>Shut down O/P current, re-power on to recover<br><b>DC to AC(BIC mode) (AC short)</b><br>NO DAMAGE<br>PROTECTION TYPE :<br>Shut down O/P current, re-power on to recover<br><b>DC to AC(GRID mode) (AC short)</b><br>NO DAMAGE<br>PROTECTION TYPE :<br>Shut down O/P current, re-power on to recover |
| 3 | OVER VOLTAGE PROTECTION     | 68V~70V<br>Protection type : Shut down O/P voltage, re-power on to recover                  | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 180VAC<br>O/P: MIN LOAD<br>Ta:25°C                                                                 | <b>AC to DC(BIC mode)</b><br>66.84/ 305VAC<br>66.83V/ 230VAC<br>66.81V/ 180VAC<br>PROTECTION TYPE :<br>Shut down O/P current, re-power on to recover                                                                                                                                                                                                                 |
| 4 | OVER TEMPERATURE PROTECTION | Protection type : Shut down O/P voltage, recovers automatically after temperature goes down | I/P: 305VAC<br>I/P: 180VAC<br>O/P: FULL LOAD                                                                                          | <b>AC to DC(BIC mode)</b><br>O.T.P. Active<br>Protection type :<br>Shut down O/P voltage, recovers automatically after temperature goes down<br><b>DC to AC(BIC mode)</b><br>O.T.P. Active<br>Protection type :<br>Shut down O/P voltage, recovers automatically after temperature goes down                                                                         |
| 5 | ISLANDING PROTECTION        | Shut down AC O/P voltage, re-power on to recover                                            | I/P: 66VDC<br>O/P: FULL LOAD/ 230VAC<br><br>I/P: 48VDC<br>O/P: 50% LOAD/ 230VAC<br><br>I/P: 38VDC<br>O/P: 10% LOAD/ 230VAC<br>Ta:25°C | <b>DC to AC(BIC mode) (AC open)</b><br>NO DAMAGE<br>*Check VAC Out<br>PROTECTION TYPE :<br>Shut down O/P current, re-power on to recover<br><b>DC to AC (GRID mode)(AC open)</b><br>NO DAMAGE<br>*Check VAC Out<br>PROTECTION TYPE :<br>Shut down O/P current, re-power on to recover                                                                                |

## CONTROL FUNCTION TEST

| NO              | TEST ITEM                     | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEST CONDITION | RESULT |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
|-----------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------|-------|----------------------------|---------------------|----------------|----------------|---------------|-------------------|-------|----------------|----------|-------------------|---------|-----|----------------|----------|----|---------|-----|-----------------|----------|----|---------|-----|
| 1               | BIDIRECTION SWITCH TIME(Typ.) | <div>I/P: 230 VAC /48VDC</div> <div>O/P:FULL LOAD</div> <div>Ta:25°C</div> <div>Test Result :</div> <table><tr><td>MODE</td><td>BIDIRECTION SWITCH TIME</td><td>Result</td></tr><tr><td>AC to DC (BIC)</td><td>1ms</td><td><u>33.5us</u></td></tr><tr><td>DC to AC (BIC)</td><td>1ms</td><td><u>640us</u></td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |        | MODE  | BIDIRECTION SWITCH TIME    | Result              | AC to DC (BIC) | 1ms            | <u>33.5us</u> | DC to AC (BIC)    | 1ms   | <u>640us</u>   |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| MODE            | BIDIRECTION SWITCH TIME       | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| AC to DC (BIC)  | 1ms                           | <u>33.5us</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| DC to AC (BIC)  | 1ms                           | <u>640us</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| 2               | REMOTE ON/OFF CONTROL         | <div>By electrical signal or dry contact Short: Power ON Open: Power OFF Please refer to the Function Manual infollowing</div> <div>I/P: 230 VAC</div> <div>O/P:FULL LOAD</div> <div>Ta:25°C</div> <div>Test Result :</div> <table><tr><td>MODE</td><td>Between ON/OFF and +5V-AUX</td><td>Power Supply Status</td></tr><tr><td rowspan="2">AC to DC (BIC)</td><td>SW SHORT</td><td>ON</td></tr><tr><td>SW OPEN</td><td>OFF</td></tr><tr><td rowspan="2">DC to AC (BIC)</td><td>SW SHORT</td><td>ON</td></tr><tr><td>SW OPEN</td><td>OFF</td></tr><tr><td rowspan="2">AC to DC (CHG)</td><td>SW SHORT</td><td>ON</td></tr><tr><td>SW OPEN</td><td>OFF</td></tr><tr><td rowspan="2">DC to AC (GRIN)</td><td>SW SHORT</td><td>ON</td></tr><tr><td>SW OPEN</td><td>OFF</td></tr></table>                                                                                                                                                                                                              |                |        | MODE  | Between ON/OFF and +5V-AUX | Power Supply Status | AC to DC (BIC) | SW SHORT       | ON            | SW OPEN           | OFF   | DC to AC (BIC) | SW SHORT | ON                | SW OPEN | OFF | AC to DC (CHG) | SW SHORT | ON | SW OPEN | OFF | DC to AC (GRIN) | SW SHORT | ON | SW OPEN | OFF |
| MODE            | Between ON/OFF and +5V-AUX    | Power Supply Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| AC to DC (BIC)  | SW SHORT                      | ON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
|                 | SW OPEN                       | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| DC to AC (BIC)  | SW SHORT                      | ON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
|                 | SW OPEN                       | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| AC to DC (CHG)  | SW SHORT                      | ON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
|                 | SW OPEN                       | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| DC to AC (GRIN) | SW SHORT                      | ON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
|                 | SW OPEN                       | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| 3               | ALARM SIGNAL                  | <div>1. DC OK SIGNAL</div> <div>High (4.5 ~ 5.5V) : When the Vout ≤ 80%±5%.</div> <div>Low (-0.5 ~ 0.5V) : When Vout ≥ 80%±5%.</div> <div>The maximum sourcing current is 4mA and only for output.</div> <div>I/P: 230 VAC</div> <div>O/P:FULL LOAD</div> <div>Ta:25°C</div> <div>Test Result</div> <table><tr><td>Spec.</td><td>Transition point</td><td>Spec.</td><td>DC OK SIGNAL</td></tr><tr><td>Vout ≤ 75%~85%</td><td>77.7%</td><td>High (4.5 ~ 5.5V)</td><td>5.16V</td></tr><tr><td>Vout ≥ 75%~85%</td><td>80.4%</td><td>Low (-0.5 ~ 0.5V)</td><td>0V</td></tr></table> <div>2. T-ALARM</div> <div>High (4.5 ~ 5.5V) : When the internal temperature exceeds the limit of temperature alarm, or when Fan fails.</div> <div>Low (-0.1 ~ 0.5V) : When the internal temperature is normal, and when Fan works normally.</div> <div>The maximum sourcing current is 4mA and only for output</div> <div>I/P: 230 VAC</div> <div>O/P:FULL LOAD</div> <div>Ta:25°C</div> <div>Test Result :</div> |                |        | Spec. | Transition point           | Spec.               | DC OK SIGNAL   | Vout ≤ 75%~85% | 77.7%         | High (4.5 ~ 5.5V) | 5.16V | Vout ≥ 75%~85% | 80.4%    | Low (-0.5 ~ 0.5V) | 0V      |     |                |          |    |         |     |                 |          |    |         |     |
| Spec.           | Transition point              | Spec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DC OK SIGNAL   |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| Vout ≤ 75%~85%  | 77.7%                         | High (4.5 ~ 5.5V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.16V          |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |
| Vout ≥ 75%~85%  | 80.4%                         | Low (-0.5 ~ 0.5V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0V             |        |       |                            |                     |                |                |               |                   |       |                |          |                   |         |     |                |          |    |         |     |                 |          |    |         |     |

| P.SU STATUS | Vo      | T-ALARM SPEC | T-ALARM TEST |
|-------------|---------|--------------|--------------|
| NORMAL      | 100%±2% | -0.5 ~0.5V   | 0V           |
| OTP         | 0V      | 4.5~5.5V     | 5.16V        |
| FAN LOCK    | 0V      | 4.5~5.5V     | 5.16V        |

### 3. Fault

High (4.5 ~ 5.5V) : When the  $V_{ac} \leq 165V_{rms}$ , OLP, SCP, OTP, OVP, AC Fail, fan lock, islanding protection.

Low (-0.5 ~ 0.5V) : When  $V_{ac} \geq 175V_{rms}$  and when power supply work normally.

The maximum sourcing current is 4mA and only for output. (Note.1)

I/P: 230 VAC

O/P: FULL LOAD

Ta: 25°C

Test Result :

| Spec.                 | Spec.             | Fault Signal |
|-----------------------|-------------------|--------------|
| VAC $\leq 165V_{rms}$ | High (4.5 ~ 5.5V) | 5.16V        |
| OLP                   |                   | 5.16V        |
| SCP                   |                   | 5.16V        |
| OTP                   |                   | 5.16V        |
| OVP                   |                   | 5.16V        |
| AC Fail               |                   | 5.16V        |
| Fan lock              |                   | 5.16V        |
| Islanding protection  |                   | 5.16V        |
| Work normal           | -0.5 ~0.5V        | 0V           |

|   |                   |                                                                                                        |                                                  |                                                                                                                                                                                                                                           |
|---|-------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | CURRENT SHARING   | CURRENT SHARING<br>TOLERANCE $< \pm 10\%$                                                              | I/P : 230 VAC<br>O/P : 95%/50% LOAD<br>Ta : 25°C | O/P : 95%<br>PSU1 : 100.12A<br>PSU2 : 100.02A<br>PSU3 : 96.68A<br>PSU4 : 102.38A<br>PSU5 : 98.45A<br>PSU6 : 97.47A<br><br>O/P : 50%<br>PSU1 : 53.25A<br>PSU2 : 51.93A<br>PSU3 : 51.55A<br>PSU4 : 53.22A<br>PSU5 : 51.33A<br>PSU6 : 51.09A |
| 5 | FAN SPEED CONTROL | 10% load 43dB<br>70% load 44dB<br>with Ta=25°C                                                         | I/P: 230VAC<br>O/P: TESTING Load<br>Ta: 25°C     | 42.72dB @10%Load<br>42.83dB @70%Load                                                                                                                                                                                                      |
| 6 | C/D Control       | High (4.5 ~ 5.5V) : Battery Charging mode<br>Low (0 ~ 0.5V) : Battery Discharging mode<br>I/P: 230 VAC |                                                  |                                                                                                                                                                                                                                           |

|         |             |                            |                               |          |
|---------|-------------|----------------------------|-------------------------------|----------|
|         |             | O/P:FULL LOAD/ 50V         |                               |          |
|         |             | Ta:25°C                    |                               |          |
|         |             | Test Result : PASS         |                               |          |
|         |             | MODE                       | Between ON/OFF and<br>+5V-AUX | Status   |
|         |             | AC to DC<br>(Battery mode) | SW SHORT                      | Charging |
| SW OPEN | Discharging |                            |                               |          |

## COMPONENT STRESS TEST

[illegible]

|   |          |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                      |
|---|----------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |          |                                                                          | (2)Output Short<br>(3)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5)Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6)Dynamic Load Full Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br><br><b>DC to AC</b><br>I/P : High line (66Vdc)<br>O/P : 308VAC / 63HZ<br>VCE:<br>(1) Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br><br>I/P : Low line (48Vdc)<br>O/P : 197VAC / 47HZ<br>VCE:<br>(1) Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br><br>Ta:25°C | (2)533V/37.7A (2)569V/41.3A<br>(3)505V/44.5A (3)509V/31.2A<br>(4)501V/32.9A (4)533V/44.0A<br>(5)505V/32.1A (5)509V/34.4A<br>(6)501V/28.8A (6)505V/41.6A<br>(7)489V/21.6A (7)489V/50.5A<br><br>(1)561V/46.5A (1)573V/54.6A<br>(2)581V/47.4A (2)577V/53.1A<br>(3)553V/26A (3)553V/26A<br><br>(1)565V/38.1A (1)589V/43.7A<br>(2)573V/41.3A (2)573V/49.3A<br>(3)573V/39.7A (3)589V/44.5A |
| 3 | BUCK MOS | Q 901、Q905<br>Rated : 650V<br>80 A@TC=25°C<br>56 A@TC=100°C<br>VGE :±20V | <b>AC to DC</b><br>I/P:High-Line +3V =308V / 63Hz<br>AC ON/OFF<br>O/P: (1)Full Load<br>(2)Output Short<br>(3)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5)Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6)Dynamic Load Full Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br><br><b>DC to AC</b><br>I/P : High line (66Vdc)<br>O/P : 308VAC / 63HZ<br>VCE:<br>(1) Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br><br>I/P : Low line (48Vdc)                            | Q901 Q905<br>(1)585V/15.5A (1)497V/30.9A<br>(2)606V/24.9A (2)646V/49.7A<br>(3)577V/15.5A (3)497V/30.9A<br>(4)573V/14.8A (4)497V/29.6A<br>(5)585V/15.7A (5)497V/31.3A<br>(6)593V/14.8A (6)577V/29.6A<br>(7)626V/37.7A (7)485V/75.4A<br><br>(1)513V/15.8A (1)593V/31.5A<br>(2)602V/16.5A (2)634V/33.0A<br>(3)521V/9.7A (3)561V/19.4A                                                   |

|   |                          |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                          |                                                 |
|---|--------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
|   |                          |                                                           | O/P : 197VAC / 47HZ<br>VCE:<br>(1) Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br>Ta:25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (1)529V/16.9A<br>(2)585V/16.9A<br>(3)525V/16.1A                                                                                                                                                                                                          | (1)618V/33.7A<br>(2)606V/33.7A<br>(3)593V/32.1A |
| 4 | SR MOS                   | Q120 :<br>Rated : 120V/72A(TC=100°C)<br>Vgs max -20/+20 V | AC to DC<br>I/P : 308V / 63Hz<br><u>VO: SPEC MAX</u><br>AC ON/OFF<br>O/P: (1)Full Load<br>(2)Output Short<br>(3)Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(4)Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5)Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6)Dynamic Load Full Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br>(8).NO LOAD<br><br><u>VO: standard</u><br>O/P: (1)Full Load<br>DC to AC<br>I/P : High line (66Vdc)<br>O/P : 308VAC / 63HZ<br>VDS:<br>(1)Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br>I/P : Low line (48Vdc)<br>O/P : 197VAC / 47HZ<br>VDS:<br>(1)Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br>Ta:25°C | (1)69.6V<br>(2)69.7V<br>(3)69.7V<br><br>(4)69.7V<br>(5)69.7V<br>(6)71.4V<br>(7)69.7V<br>(8)69.7V<br><br>(1)51.8V<br><br><br><br><br><br><br><br><br><br><br>(1) 73.7V<br>(2)50.5V<br>(3)67.3V<br><br><br><br><br><br><br>(1) 56V<br>(2)51.3V<br>(3)48.8V |                                                 |
| 5 | DC BUS Capacitor Voltage | C5 :<br>Rated : 470u / 550V<br>Surge voltage : 600 V      | AC to DC<br>I/P:High-Line +3V =308V / 63Hz<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 continue<br><br>DC to AC<br>I/P : High line (66Vdc)<br>O/P : 308VAC / 63HZ                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (1) 513V<br>(2)493V<br>(3)517V<br>(4)513V<br><br><br><br><br><br><br>(1)525V                                                                                                                                                                             |                                                 |

|  |  |  |                                                                                                                                                                                                  |                                                         |
|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
|  |  |  | (1) Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br>I/P : Low line (48Vdc)<br>O/P : 197VAC / 47HZ<br>(1) Full Load<br>(2) +100%Io/1S~-100%Io/1S<br>(3) -100%Io AC Off<br>Ta:25°C | (2)537V<br>(3)521V<br><br>(1)549V<br>(2)537V<br>(3)529V |
|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

## ■ SAFETY& E.M.C. TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                             | TEST CONDITION                                                                   | RESULT                                                                  |
|----|----------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 6 K VDC/min<br>I/P-FG : 4 K VDC/min<br>O/P-FG: 4 KVDC/min        | I/P-O/P: 6.6 KVDC/min<br>I/P-FG: 4.4 KVDC/min<br>O/P-FG: 4.4 KVDC/min<br>Ta:25°C | I/P-O/P: 0.002 mA<br>I/P - F G : 0.002 mA<br>O/P - F G : 0.002 m A      |
| 2  | ISOLATION RESISTANCE | I/P-O/P: 500 VDC>100MΩ<br>O/P-FG: 500 VDC>100MΩ<br>I/P-FG: 500 VDC >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: 10.6 MΩ<br>I/P - F G : 22.9 MΩ<br>O/P-FG: 8.76 MΩ<br>NO DAMAGE |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                                    | 50A / 2min<br>Ta:25°C                                                            | 19 mΩ                                                                   |

### E.M.C TEST

| NO | TEST ITEM  | SPECIFICATION                                        | TEST CONDITION                                           | RESULT                        |
|----|------------|------------------------------------------------------|----------------------------------------------------------|-------------------------------|
| 1  | HARMONIC   | EN61000-3-12<br>CLASS A                              | 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/50% 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>INDUSTRY<br>AIR : 8KV / 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>INDUSTRY<br>INPUT : 2KV               | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    |



|   |                                                                                                                                   |                                                       |                                                    |            |
|---|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|------------|
| 6 | SURGE                                                                                                                             | IEC61000-6-2<br>INDUSTRY<br>L-N : 2KV<br>L,N-PE : 4KV | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C | CRITERIA A |
| 7 | Test by certified Lab & Test Report Prepare<br>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 : BIC-5K-48<br><b>AC to DC Direction:</b><br>1. ROOM AMBIENT BURN-IN : 2 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta= 25 °C<br>2. HIGH AMBIENT BURN-IN : 22.5HRS<br>I/P : 230VAC O/P : FULL LOAD Ta= 40 °C<br><br><b>DC to AC Direction:</b><br>1. ROOM AMBIENT BURN-IN : 2 HRS<br>I/P : 24VDC O/P : FULL LOAD Ta= 25 °C<br>2. HIGH AMBIENT BURN-IN : 2 HRS<br>I/P : 24VDC O/P : FULL LOAD Ta= 40 °C |                |        |

|   |                                 | NO                          | Position   | AC to DC Direction:                                     |              | DC to AC Direction: |              |
|---|---------------------------------|-----------------------------|------------|---------------------------------------------------------|--------------|---------------------|--------------|
|   |                                 |                             |            | ROOM AMBIENT                                            | HIGH AMBIENT | ROOM AMBIENT        | HIGH AMBIENT |
|   |                                 |                             |            | Ta= 25°C                                                | Ta= 40 °C    | Ta= 25°C            | Ta= 40 °C    |
|   |                                 | 1                           | L901       | 65.4°C                                                  | 76.8°C       | 35.1°C              | 48.7°C       |
|   |                                 | 2                           | L902       | 49.1°C                                                  | 61.0°C       | 56.0°C              | 62.8°C       |
|   |                                 | 3                           | L11        | 52.0°C                                                  | 61.4°C       | 50.0°C              | 57.4°C       |
|   |                                 | 4                           | C6         | 50.7°C                                                  | 62.0°C       | 52.6°C              | 60.8°C       |
|   |                                 | 5                           | Q902       | 93.3°C                                                  | 104.8°C      | 115.9°C             | 121.2°C      |
|   |                                 | 6                           | Q905       | 98.4°C                                                  | 111.5°C      | 122.4°C             | 126.5°C      |
|   |                                 | 7                           | Q3         | 74.5°C                                                  | 86.7°C       | 73.1°C              | 81.7°C       |
|   |                                 | 8                           | Q7         | 77.4°C                                                  | 89.5°C       | 73.1°C              | 81.5°C       |
|   |                                 | 9                           | Q2         | 74.1°C                                                  | 86.1°C       | 70.8°C              | 79.2°C       |
|   |                                 | 10                          | Q6         | 74.5°C                                                  | 86.4°C       | 70.3°C              | 78.3°C       |
|   |                                 | 11                          | Q917       | 38.8°C                                                  | 51.5°C       | 42.3°C              | 51.7°C       |
|   |                                 | 12                          | Q918       | 39.2°C                                                  | 51.5°C       | 43.1°C              | 52.2°C       |
|   |                                 | 13                          | Q701       | 56.7°C                                                  | 66.5°C       | 57.0°C              | 65.2°C       |
|   |                                 | 14                          | T701       | 48.3°C                                                  | 57.6°C       | 48.0°C              | 56.7°C       |
|   |                                 | 15                          | T1-Wire    | 58.5°C                                                  | 69.5°C       | 59.7°C              | 67.5°C       |
|   |                                 | 16                          | T1-core    | 54.6°C                                                  | 65.6°C       | 55.6°C              | 63.3°C       |
|   |                                 | 17                          | T2-Wire    | 50.4°C                                                  | 62.8°C       | 55.9°C              | 64.4°C       |
|   |                                 | 18                          | T2-core    | 54.2°C                                                  | 66.0°C       | 57.2°C              | 65.2°C       |
|   |                                 | 19                          | Q233       | 45.8°C                                                  | 55.3°C       | 47.1°C              | 54.4°C       |
|   |                                 | 20                          | Q232       | 42.4°C                                                  | 51.1°C       | 43.7°C              | 50.7°C       |
|   |                                 | 21                          | Q124       | 45.7°C                                                  | 58.2°C       | 50.8°C              | 58.4°C       |
|   |                                 | 22                          | Q125       | 47.0°C                                                  | 59.5°C       | 51.7°C              | 60.3°C       |
|   |                                 | 23                          | C201       | 50.5°C                                                  | 60.3°C       | 50.8°C              | 58.2°C       |
|   |                                 | 24                          | C103       | 47.7°C                                                  | 59.5°C       | 50.7°C              | 58.8°C       |
|   |                                 | 25                          | LF1        | 48.8°C                                                  | 62.4°C       | 49.7°C              | 58.0°C       |
|   |                                 | 26                          | D311       | 54.6°C                                                  | 63.6°C       | 54.7°C              | 62.5°C       |
|   |                                 | 27                          | RG74       | 66.3°C                                                  | 71.3°C       | 63.9°C              | 74.0°C       |
|   |                                 | 28                          | C711       | 56.5°C                                                  | 65.3°C       | 57.1°C              | 65.6°C       |
|   |                                 | 29                          | RTH1(Q905) | 83.5°C                                                  | 96.6°C       | 93.9°C              | 99.4°C       |
|   |                                 | 30                          | RTH2(IGBT) | 68.2°C                                                  | 80.2°C       | 65.4°C              | 73.5°C       |
|   |                                 | 31                          | RTH3(T1)   | 55.8°C                                                  | 67.4°C       | 57.7°C              | 65.7°C       |
|   |                                 | 32                          | RTH4(DD)   | 43.8°C                                                  | 56.3°C       | 48.8°C              | 57.1°C       |
|   |                                 | 33                          | HS102(DD)  | 43.6°C                                                  | 56.0°C       | 48.4°C              | 56.6°C       |
|   |                                 | 34                          | HS1(Q905)  | 63.4°C                                                  | 77.0°C       | 75.6°C              | 82.1°C       |
| 2 | OVER LOAD BURN-IN TEST          | NO DAMAGE<br>1 HOUR ( MIN ) |            | I/P : 230 VAC<br>O/P : 110% LOAD<br>Ta : 25°C           |              | TEST : OK           |              |
| 3 | LOW TEMPERATURE<br>TURN ON TEST | TURN ON AFTER 2 HOUR        |            | I/P : 305VAC/180VAC<br>O/P : 100 %/80%LOAD<br>Ta= -32°C |              | TEST : OK           |              |



# AC⇌DC 5KW Bidirectional Power Supply with Energy Recycle **BIC-5K** series

|    |                                                                   |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                               |                                                                  |
|----|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 40 °C/95 %R.H<br>NO DAMAGE                                                                                                                                                                                                    | I/P : 315 VAC<br>O/P : FULL LOAD<br>Ta= 40 °C<br>HUMIDITY= 95 %R.H                                                                                                                                                                                                                                            | TEST : OK                                                        |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03%/°C(0~40°C)                                                                                                                                                                                                                                                       | I/P : 230 VAC<br>O/P : FULL LOAD                                                                                                                                                                                                                                                                              | ± 0.008%/°C(0~40°C)                                              |
| 6  | STORAGE TEMPERATURE<br>TEST                                       | -40°C~85°C                                                                                                                                                                                                                                                               | 1. Thermal shock Temperature : -45°C~ +90°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition : STATIC                                                                                        |                                                                  |
| 7  | THERMAL SHOCK TEST                                                | -30°C~40°C                                                                                                                                                                                                                                                               | 1. Thermal shock Temperature : -32°C~ +45°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 16 CYCLE<br>5. Input/Output condition :<br>15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST<br>1cycle:230V/ FULL LOAD Burn In Test |                                                                  |
| 8  | VIBRATION TEST                                                    | 10 ~ 500Hz, 3G 10min./1cycle,<br>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 : 4G<br>(5) Test Time : 180min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                       |                                                                  |
| 9  | CAPACITOR<br>LIFE CYCLE                                           | SUPPOSE C201 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= 40 °C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta= 40°C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta= 40 °C LIFE TIME |                                                                                                                                                                                                                                                                                                               | (1) 362379HRS<br>(2) 183719HRS<br>(3) 300240HRS<br>(4) 346355HRS |
| 10 | MTBF                                                              | Conducted by Parts Stress Analysis Prediction<br>209.4K hrs min. Telcordia SR-332 (Bellcore) ; 17.8K hrs min. MIL-HDBK-217F (25°C)                                                                                                                                       |                                                                                                                                                                                                                                                                                                               |                                                                  |
| 11 | Ongoing Reliability Test                                          | I/P : 230VAC O/P : FULL LOAD TA=40°C<br>Demonstration Mean Time Between Failure : 50,000 hours                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                               |                                                                  |

| TEST RESULT | TESTER     | REVIEW     | APPROVAL |
|-------------|------------|------------|----------|
| PASS        | DANIEL GAO | SANFORD SU | ERIS WU  |

2020.10.1 TAG-QA-009