



# TEST REPORT: EPS-65S-12

## 65W Single Output Switching Power Supply

### ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

### ■ SAFETY & E.M.C. TEST

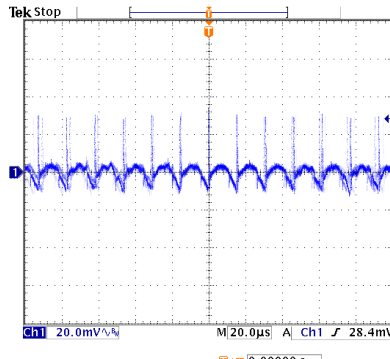
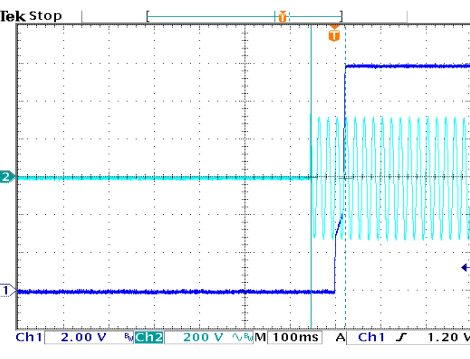
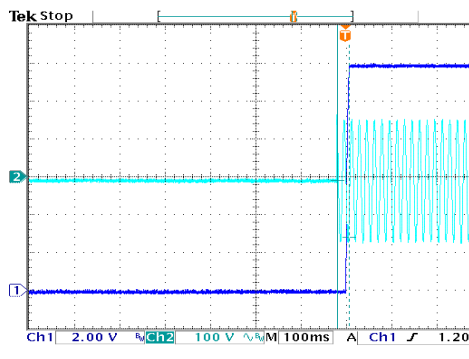
Safety Test

E.M.C. Test

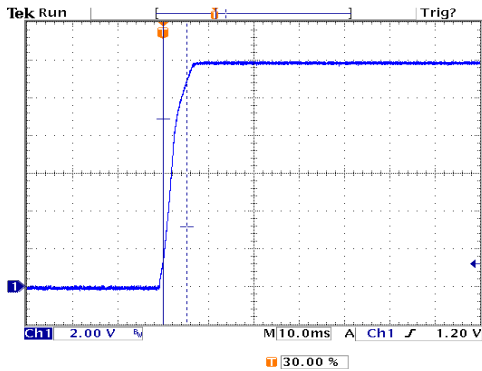
### ■ RELIABILITY TEST

ENVIRONMENT TEST

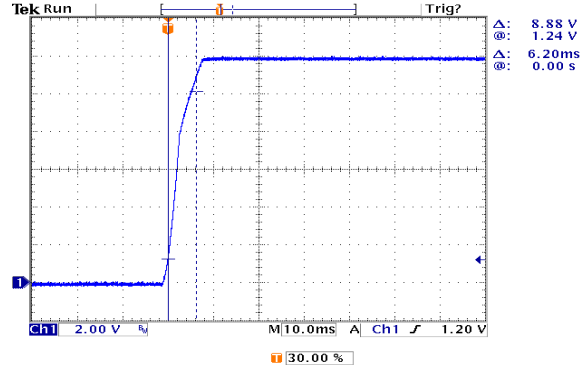
# DESIGN VERIFY TEST OUTPUT FUNCTION

| NO | TEST ITEM                         | SPECIFICATION                                                                                                                                                        | TEST CONDITION                                              | RESULT                           |
|----|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------|
| 1  | OUTPUT VOLTAGE<br>ADJUST RANGE    | CH1: 11.40V ~ 13.20V                                                                                                                                                 | I/P : 230VAC<br>O/P: MIN LOAD<br>TA : 25°C                  | CH1: 11.14V ~ 13.67V             |
| 2  | OUTPUT VOLTAGE<br>TOLERANCE (Max) | V1 : 2.0% ~ -2.0%                                                                                                                                                    | I/P : 115VAC / 264VAC<br>O/P: FULL / MINLOAD<br>TA= 25°C    | V1: 0.36% ~ -0.36%               |
| 3  | LINE REGULATION<br>(MAX.)         | V1 : 0.5% ~ -0.5%                                                                                                                                                    | I/P : 115VAC / 264VAC<br>O/P: FULL LOAD<br>TA : 25°C        | V1: 0.00% ~ -0.05%               |
| 4  | LOAD REGULATION<br>(MAX.)         | V1 : 2.0% ~ -2.0%                                                                                                                                                    | I/P : 230VAC<br>O/P: MIN LOAD ~ FULL LOAD<br>TA : 25°C      | V1: 0.36% ~ -0.36%               |
| 5  | OVER/UNDERSHOOT<br>TEST           | < ±5%                                                                                                                                                                | I/P : 230VAC<br>O/P: FULL LOAD<br>TA : 25°C                 | TEST< 1.000 %                    |
| 6  | RIPPLE & NOISE(Max)               | V1 : 120 mVp-p                                                                                                                                                       | I/P : 230VAC<br>O/P: FULL LOAD<br>TA : 25°C                 | V1 : 46.8 mVp-p                  |
|    |                                   | high frequency :<br>                                                               |                                                             |                                  |
| 7  | SET UP TIME (MAX.)                | 230VAC : 500ms<br>115VAC : 500ms                                                                                                                                     | I/P : 230VAC<br>I/P : 115VAC                                | 230VAC : 76ms<br>115VAC : 26ms   |
|    |                                   | INPUT=230VAC/50HZ @ FULL LOAD<br>CH1 : Output Voltage CH2 : AC Input Voltage<br>   |                                                             |                                  |
| 8  | RISE TIME (MAX.)                  | 230VAC : 30ms<br>115VAC : 30ms                                                                                                                                       | I/P : 230VAC<br>I/P : 115VAC<br>O/P: FULL LOAD<br>TA : 25°C | 230VAC : 5.2ms<br>115VAC : 6.2ms |
|    |                                   | INPUT=115VAC/60HZ @ FULL LOAD<br>CH1 : Output Voltage CH2 : AC Input Voltage<br> |                                                             |                                  |

INPUT=230VAC/50HZ @ FULL LOAD  
CH1 : Output Voltage



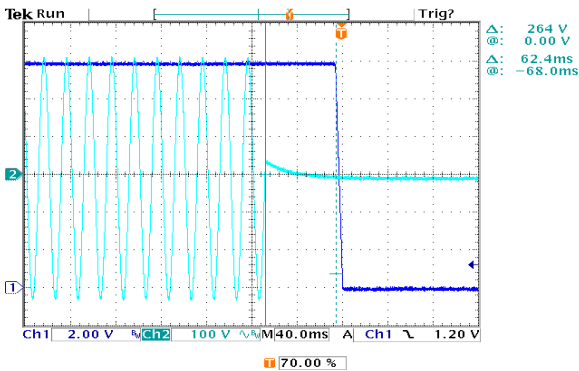
INPUT=115VAC/60HZ @ FULL LOAD  
CH1 : Output Voltage



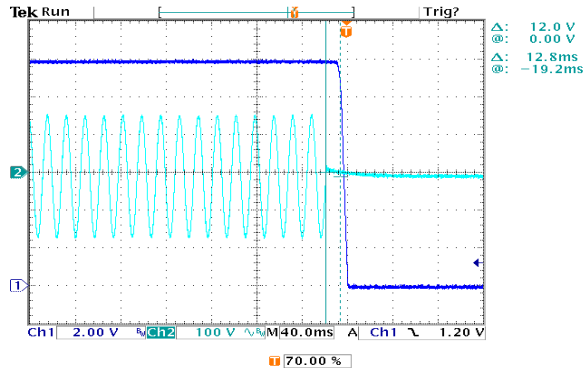
HOLD UP TIME (TYP.)

|        |        |                |        |          |
|--------|--------|----------------|--------|----------|
| 230VAC | : 30ms | I/P : 230VAC   | 230VAC | : 62.4ms |
| 115VAC | : 12ms | I/P : 115VAC   | 115VAC | : 12.8ms |
|        |        | O/P: FULL LOAD |        |          |
|        |        | TA : 25°C      |        |          |

INPUT=230VAC/50HZ @ FULL LOAD  
CH1 : Output Voltage CH2 : AC Input Voltage



INPUT=115VAC/60HZ @ FULL LOAD  
CH1 : Output Voltage CH2 : AC Input Voltage

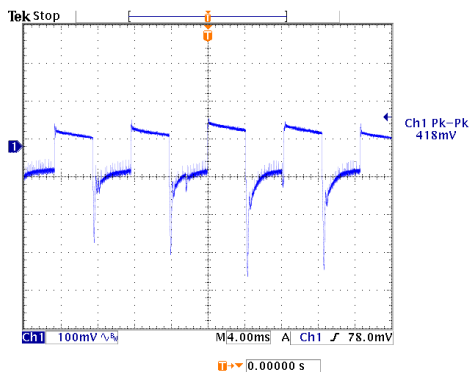
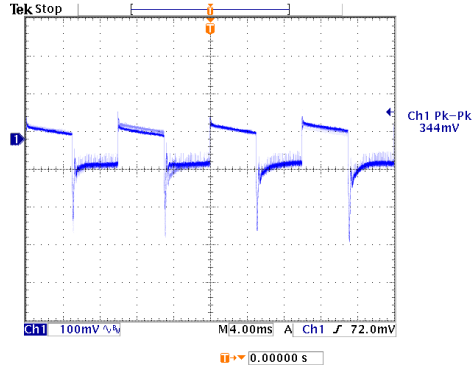


DYNAMIC LOAD

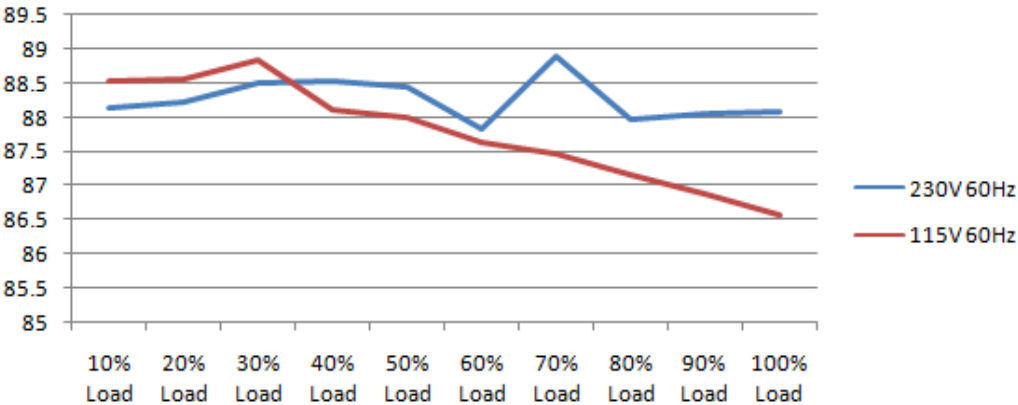
|                 |                                |             |         |            |
|-----------------|--------------------------------|-------------|---------|------------|
| V1 : 1200 mVp-p | I/P : 230VAC                   | (1).        | (2).    | unit:mVp-p |
|                 | O/P:                           |             |         |            |
|                 | (1)Full/Min load 50%duty/120HZ | V1: 418.0mv | 344.0mv |            |
|                 | (2)Full/Min load 50%duty/1KHZ  |             |         |            |
|                 | TA : 25°C                      |             |         |            |

FULL /50% LOAD 50%DUTY / 120HZ

FULL /50% LOAD 50%DUTY / 1KHZ



## INPUT FUNCTION TEST

| NO | TEST ITEM                 | SPECIFICATION              | TEST CONDITION                                                                                                                       | RESULT                                |
|----|---------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 1  | INPUT VOLTAGE RANGE       | 80VAC ~ 264VAC             | I/P : TESTING<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                        | 65.3VAC ~ 264VAC                      |
|    |                           |                            | I/P :<br>LOW-LINE = 77VAC<br>HIGH-LINE = 300VAC<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     | 47HZ ~ 63HZ<br>NO DAMAGE   | I/P : 115VAC ~ 264VAC<br>O/P : FULL-MIN LOAD<br>Ta : 25°C                                                                            | TEST : OK                             |
| 3  | INPUT CURRENT (TYP.)      | 1 / 230VAC<br>1.5 / 115VAC | I/P : 230VAC<br>I/P : 115VAC<br>O/P : FULL LOAD<br>TA : 25°C                                                                         | I= 0.559 / 230VAC<br>I= 1.08 / 115VAC |
| 4  | LEAKAGE CURRENT           | < 0.25mA                   | I/P : 264VAC<br>O/P : MIN LOAD<br>TA : 25°C                                                                                          | L-FG: 0.084 mA<br>N-FG: 0.084 mA      |
| 5  | NO LOAD POWER CONSUMPTION | < 0.10W                    | I/P : 230VAC<br>O/P : MIN LOAD<br>TA : 25°C                                                                                          | < 0.0493 W                            |
| 6  | EFFICIENCY (TYP.)         | 88.0%                      | I/P : 230VAC<br>O/P : FULL LOAD<br>TA : 25°C                                                                                         | 88.12 %                               |
|    |                           |                            |                                                  |                                       |

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| Load (%) | 230V 60Hz (%) | 115V 60Hz (%) |
|----------|---------------|---------------|
| 10%      | 88.2          | 88.6          |
| 20%      | 88.4          | 88.6          |
| 30%      | 88.6          | 88.9          |
| 40%      | 88.6          | 88.2          |
| 50%      | 88.5          | 88.1          |
| 60%      | 87.9          | 87.6          |
| 70%      | 88.9          | 87.5          |
| 80%      | 88.1          | 87.2          |
| 90%      | 88.2          | 86.9          |
| 100%     | 88.2          | 86.6          |

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|                       |                                   |                |                    |
|-----------------------|-----------------------------------|----------------|--------------------|
| INRUSH CURRENT (TYP.) | 50A / 230VAC                      | I/P : 230VAC   | I= 27.30A / 230VAC |
|                       | 30A / 115VAC                      | I/P : 115VAC   | I= 27.20A / 115VAC |
|                       | width= 0 us measured at 50% Ipeak | O/P: FULL LOAD |                    |
|                       | COLD START                        | TA : 25°C      |                    |

INPUT=230VAC/50HZ @ FULL LOAD  
CH2 : Input current (1V=1A) CH4 : AC Input Voltage

Ch2 200 V 10.0ms A Ch4 5.00 V 1.40 V

Ch4 Max 27.3 V

INPUT=115VAC/50HZ @ FULL LOAD  
CH2 : Input current (1V=1A) CH4 : AC Input Voltage

Ch2 200 V 10.0ms A Ch4 5.00 V 2.50 V

Ch4 Max 27.2 V



## PROTECTION FUNCTION TEST

| NO | TEST ITEM               | SPECIFICATION                          | TEST CONDITION                                                        | RESULT                                                                   |
|----|-------------------------|----------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1  | OVER LOAD PROTECTION    | 115% ~ 150%                            | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 115VAC<br>O/P: TESTING<br>Ta: 25°C | 141.5% 264VAC<br>144.1% 230VAC<br>134.1% 115VAC<br>Hiccup Mode           |
| 2  | OVER VOLTAGE PROTECTION | 13.80V ~ 16.20V                        | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 80VAC<br>O/P: MIN LOAD<br>Ta: 25°C | 15.34V 264VAC<br>15.33V 230VAC<br>15.34V 80VAC<br>Shut down Re- power ON |
| 3  | SHORT PROTECTION        | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 264VAC<br>I/P: 80VAC<br>O/P: FULL LOAD<br>Ta: 25°C               | NO DAMAGE<br>Hiccup Mode                                                 |

## COMPONENT STRESS TEST

| NO | TEST ITEM            | SPECIFICATION                         | TEST CONDITION                                                                                                            | RESULT                                                                        |
|----|----------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| 1  | PWM Power Transistor | Q1 Rated : 600V 11.0A                 | I/P : 267VAC<br><br>VDS :<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C         | VIN: 267VAC<br>VDS:<br>(1). 548.00V<br>(2). 500.00V<br>(3). 528.00V           |
| 2  | Input Capacitor      | C5 Rated : 100uf 400V                 | I/P : 267VAC<br>O/P : (1)Full Load Turn on /Off<br>(2)Min load Turn on /Off<br>(3)Full Load /Min load Change<br>Ta : 25°C | (1). 344.00V<br>(2). 348.00V<br>(3). 348.00V                                  |
| 3  | Control IC           | U1 Rated : 28.0V (max)<br>-0.3V (min) | I/P : 267VAC<br>O/P : (1)Full Load<br>(2)Output Short<br>(3)O.L.P<br>(4)O.V.P<br>(5)Low Line No Load Vo(min)<br>Ta : 25°C | U1<br>(1). 20.60V<br>(2). 11.90V<br>(3). 21.20V<br>(4). 21.40V<br>(5). 17.80V |
| 4  | O/P Diode            | D100 Rated : 80V 20.0A                | I/P : 267VAC<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C                      | (1). 57.00V<br>(2). 45.80V<br>(3). 57.20V                                     |
| 5  | Clamp Diode          | D5 Rated : 800V 2.0A                  | I/P : 267VAC<br>O/P : (1)Full load continue<br>Ta : 25°C                                                                  | (1). 484.00V                                                                  |

## SAFETY &amp; E.M.C. TEST

## SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION            | TEST CONDITION                       | RESULT                       |
|----|----------------------|--------------------------|--------------------------------------|------------------------------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P : 3.000KVAC /min | I/P-O/P: 3.300KVAC /min<br>Ta : 25°C | I/P-O/P: 1.53mA<br>NO DAMAGE |
| 2  | ISOLATION RESISTANCE | I/P-O/P : 500VDC>100MΩ   | I/P-O/P: 500VDC<br>Ta : 25°C/70%RH   | I/P-O/P: 9999MΩ<br>NO DAMAGE |

## E.M.C. TEST

| NO | TEST ITEM | SPECIFICATION          | TEST CONDITION                                     | RESULT |
|----|-----------|------------------------|----------------------------------------------------|--------|
| 1  | HARMONIC  | EN61000-3-2<br>CLASS A | I/P : 230VAC /50HZ<br>O/P : FULL LOAD<br>Ta : 25°C | PASS   |



|   |            |                                                 |                                                               |                               |
|---|------------|-------------------------------------------------|---------------------------------------------------------------|-------------------------------|
| 2 | CONDUCTION | EN55022<br>CLASS B                              | I/P : 230VAC /50HZ<br>O/P : FULL LOAD / 50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab |
| 3 | RADIATION  | EN55022<br>CLASS B                              | I/P : 230VAC /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 AIR: 8KV / Contact: 4KV | I/P : 230VAC /50HZ<br>O/P : FULL LOAD<br>Ta : 25°C            | CRITERIA A                    |
| 5 | E.F.T      | EN61000-4-4<br>INDUSTRY INPUT: 2KV              | I/P : 230VAC /50HZ<br>O/P : FULL LOAD<br>Ta : 25°C            | CRITERIA A                    |
| 6 | SURGE      | IEC61000-4-5<br>INDUSTRY L-N: 2KV;L/N-PE: 4KV   | I/P : 230VAC /50HZ<br>O/P : FULL LOAD<br>Ta : 25°C            | CRITERIA A                    |

## RELIABILITY TEST

| NO | TEST ITEM                                              | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TEST CONDITION                                                    | RESULT             |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|----|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------|------------------------|----------|--------------------|------------------------|---|-----|-------|-------|---|-----|-------|-------|---|-----|-------|--------|---|----|-------|--------|---|----|-------|-------|---|-----|-------|-------|---|----|-------|-------|---|------|--------|--------|---|------|--------|--------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|------|-------|-------|----|----|-------|-------|
| 1  | TEMPERATURE RISE TEST                                  | MODEL : EPS-65S-7.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 1. ROOM AMBIENT BURN-IN : 1.0hrs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                   |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | IP: 230VAC O/P: 100% LOAD TA= 29.6℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 2. HIGH AMBIENT BURN-IN : 1.0hrs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                   |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | IP: 230VAC O/P: 100% LOAD TA= 50.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | <table><tr><td>NO.</td><td>Position</td><td>ROOM AMBIENT 29.6℃</td><td>HIGH AMBIENT Ta: 50.1℃</td></tr><tr><td>1</td><td>LF1</td><td>50.5℃</td><td>68.7℃</td></tr><tr><td>2</td><td>LF2</td><td>53.7℃</td><td>72.7℃</td></tr><tr><td>3</td><td>BD1</td><td>83.3℃</td><td>101.1℃</td></tr><tr><td>4</td><td>Q1</td><td>88.8℃</td><td>106.6℃</td></tr><tr><td>5</td><td>C5</td><td>64.0℃</td><td>82.1℃</td></tr><tr><td>6</td><td>C40</td><td>78.5℃</td><td>96.1℃</td></tr><tr><td>7</td><td>T1</td><td>80.9℃</td><td>98.2℃</td></tr><tr><td>8</td><td>D100</td><td>100.9℃</td><td>117.6℃</td></tr><tr><td>9</td><td>D101</td><td>101.8℃</td><td>117.2℃</td></tr><tr><td>10</td><td>C105</td><td>75.1℃</td><td>94.3℃</td></tr><tr><td>11</td><td>C106</td><td>71.9℃</td><td>91.0℃</td></tr><tr><td>12</td><td>C107</td><td>56.3℃</td><td>74.5℃</td></tr><tr><td>13</td><td>L101</td><td>62.0℃</td><td>79.6℃</td></tr><tr><td>14</td><td>U1</td><td>69.9℃</td><td>87.2℃</td></tr></table> |                                                                   |                    | NO.                    | Position | ROOM AMBIENT 29.6℃ | HIGH AMBIENT Ta: 50.1℃ | 1 | LF1 | 50.5℃ | 68.7℃ | 2 | LF2 | 53.7℃ | 72.7℃ | 3 | BD1 | 83.3℃ | 101.1℃ | 4 | Q1 | 88.8℃ | 106.6℃ | 5 | C5 | 64.0℃ | 82.1℃ | 6 | C40 | 78.5℃ | 96.1℃ | 7 | T1 | 80.9℃ | 98.2℃ | 8 | D100 | 100.9℃ | 117.6℃ | 9 | D101 | 101.8℃ | 117.2℃ | 10 | C105 | 75.1℃ | 94.3℃ | 11 | C106 | 71.9℃ | 91.0℃ | 12 | C107 | 56.3℃ | 74.5℃ | 13 | L101 | 62.0℃ | 79.6℃ | 14 | U1 | 69.9℃ | 87.2℃ |
|    |                                                        | NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Position                                                          | ROOM AMBIENT 29.6℃ | HIGH AMBIENT Ta: 50.1℃ |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | LF1                                                               | 50.5℃              | 68.7℃                  |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | LF2                                                               | 53.7℃              | 72.7℃                  |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | BD1                                                               | 83.3℃              | 101.1℃                 |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Q1                                                                | 88.8℃              | 106.6℃                 |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | C5                                                                | 64.0℃              | 82.1℃                  |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | C40                                                               | 78.5℃              | 96.1℃                  |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | T1                                                                | 80.9℃              | 98.2℃                  |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | D100                                                              | 100.9℃             | 117.6℃                 |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 9  | D101                                                   | 101.8℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 117.2℃                                                            |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 10 | C105                                                   | 75.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 94.3℃                                                             |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 11 | C106                                                   | 71.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 91.0℃                                                             |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 12 | C107                                                   | 56.3℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 74.5℃                                                             |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 13 | L101                                                   | 62.0℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 79.6℃                                                             |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 14 | U1                                                     | 69.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 87.2℃                                                             |                    |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 2  | OVER LOAD BURN-IN TEST                                 | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | I/P : 230VAC<br>O/P : 129% LOAD<br>Ta : 25℃                       | TEST : OK          |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 3  | LOW TEMPERATURE TURN ON TEST                           | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | I/P : 264VAC / 115VAC<br>O/P : FULL LOAD<br>Ta : -30.0℃           | TEST : OK          |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE 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= 95.0% RH | TEST : OK          |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 5  | TEMPERATURE COEFFICIENT                                | ±0.03% /℃(0~50℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | I/P : 230VAC<br>O/P : FULL LOAD                                   | ±0.0140% /℃(0~50℃) |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 6  | STORAGE TEMPERATURE TEST                               | 1. Thermal shock Temperature : -40℃ ~ +85℃<br>2. Temperature change rate : 25℃ / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 5 CYCLE<br>5. Input/Output condition : STATIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   | TEST : OK          |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
| 7  | THERMAL SHOCK TEST                                     | 1. Thermal shock Temperature : -35℃ ~ +55℃<br>2. Temperature change rate : 25℃ / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition :<br>230VAC Full Load AC ON/OFF test turn on 58sec ; turn off 2sec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                   | TEST : OK          |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |
|    |                                                        | 1 Carton & 1 Set                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                   | TEST : OK          |                        |          |                    |                        |   |     |       |       |   |     |       |       |   |     |       |        |   |    |       |        |   |    |       |       |   |     |       |       |   |    |       |       |   |      |        |        |   |      |        |        |    |      |       |       |    |      |       |       |    |      |       |       |    |      |       |       |    |    |       |       |



|    |                              |                                                                                                                                                                                                                                                                                |                                                                            |
|----|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 8  | VIBRATION TEST               | (1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(4) Acceleration : 2G<br>(5) Test Time : 60min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                                                   |                                                                            |
| 9  | CAPACITOR LIFE CYCLE         | :SUPPOSE C106 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25.0°C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= 50.0°C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta= 50.0°C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta= 50.0°C LIFE TIME | (1). 158118 HRS<br>(2). 17782.8 HRS<br>(3). 44588.4 HRS<br>(4). 158118 HRS |
| 10 | MTBF                         | MIL-HDBK-217F<br>TOTAL FAILURE RATE : 959.1 KHRS                                                                                                                                                                                                                               |                                                                            |
| 11 | DMTBF /Accelerated Life test | Demonstration Mean Time Between Failure (Expected Life): Above 50000HRS @ TA 50°C                                                                                                                                                                                              |                                                                            |

|             |        |        |          |
|-------------|--------|--------|----------|
| TEST RESULT | TESTER | REVIEW | APPROVAL |
| PASS        | FRANK  | GESG   | WANGDZ   |

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