



# TEST REPORT: KNX-20E-640

## 640mA KNX Power Supply

### ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

### ■ SAFETY & E.M.C. TEST

Safety Test

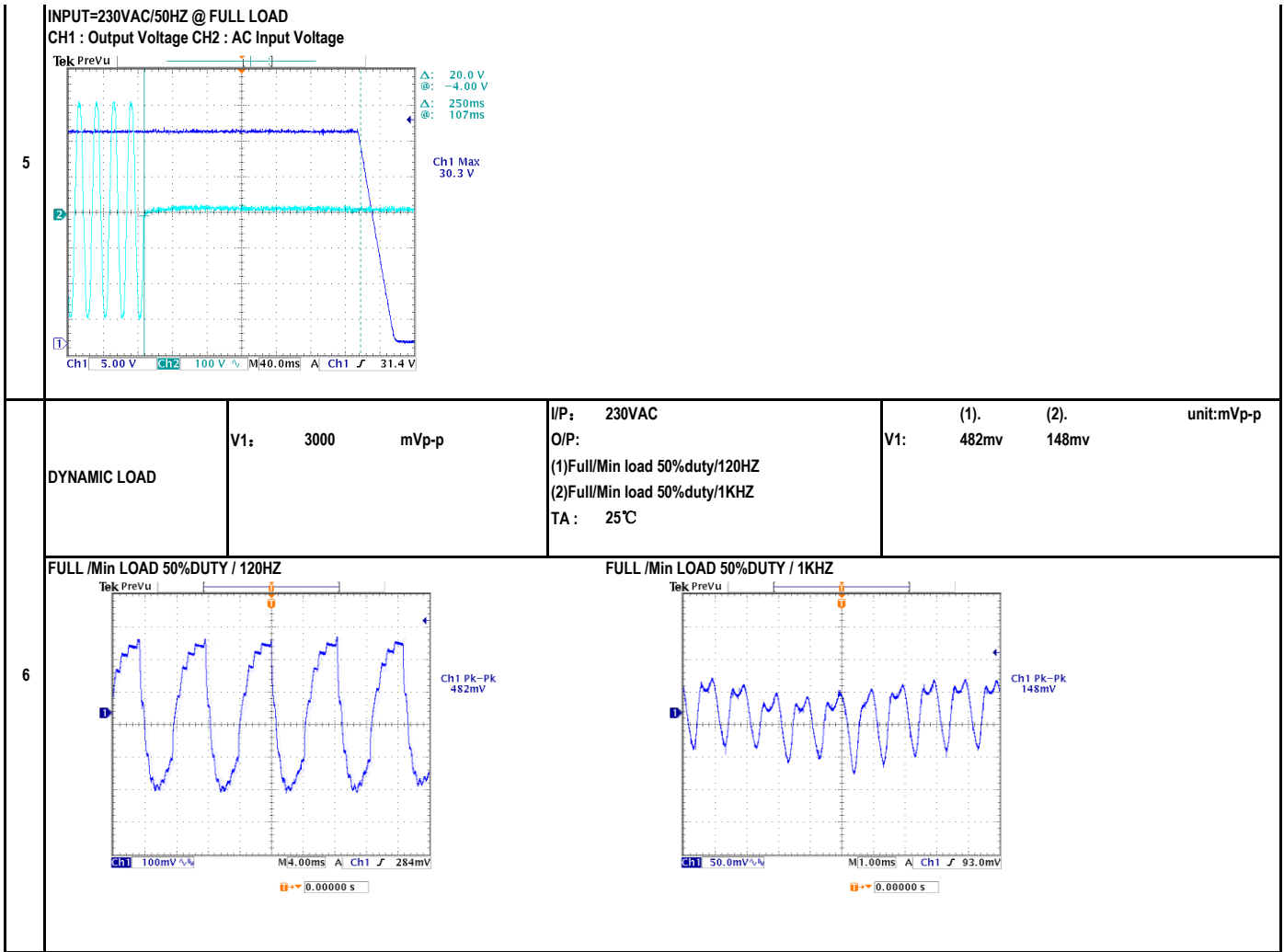
E.M.C. Test

### ■ RELIABILITY TEST

ENVIRONMENT TEST

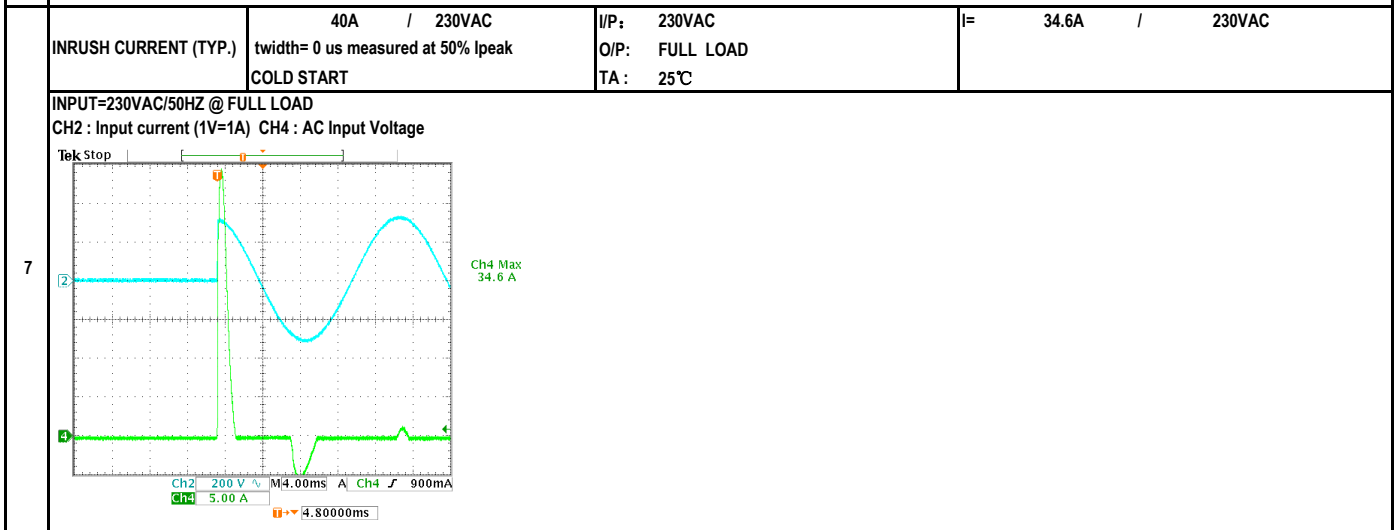
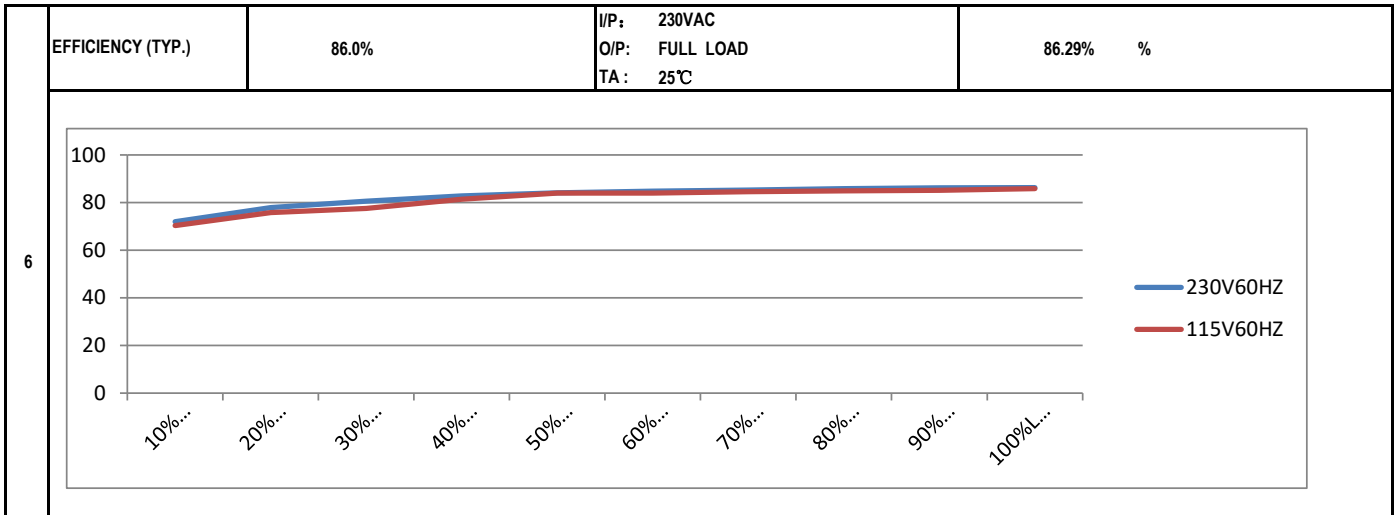
■ DESIGN VERIFY TEST  
OUTPUT FUNCTION TEST

| NO | TEST ITEM            | SPECIFICATION   | TEST CONDITION                            | RESULT           |
|----|----------------------|-----------------|---|------------------|
| 1  | OVER/UNDERSHOOT TEST | < ±5%           | I/P: 230VAC<br>O/P: FULL LOAD<br>TA: 25°C | TEST< 3.7 %      |
| 2  | RIPPLE & NOISE(Max)  | V1: 100 mVp-p   | I/P: 230VAC<br>O/P: FULL LOAD<br>TA: 25°C | V1: 72.4 mVp-p   |
|    |                      |                 |   |                  |
| 3  | SET UP TIME (MAX.)   | 230VAC : 1000ms | I/P: 230VAC<br>O/P: FULL LOAD<br>TA: 25°C | 230VAC : 212ms   |
| 4  | RISE TIME (MAX.)     | 230VAC : 50ms   | I/P: 230VAC<br>O/P: FULL LOAD<br>TA: 25°C | 230VAC : 12.0ms  |
|    |                      |                 |   |                  |
| 4  | HOLD UP TIME (TYP.)  | 230VAC : 200ms  | I/P: 230VAC<br>O/P: FULL LOAD<br>TA: 25°C | 230VAC : 250.0ms |
|    |                      |                 |   |                  |



### INPUT FUNCTION TEST

| NO | TEST ITEM                 | SPECIFICATION                      | TEST CONDITION  | RESULT                                 |
|----|---------------------------|------------------------------------|---|--|
| 1  | INPUT VOLTAGE RANGE       | 180VAC ~ 264VAC<br>230VDC ~ 370VDC | I/P: TESTING<br>O/P: FULL LOAD<br>Ta: 25°C  | 140.0VAC ~ 264VAC<br>197.9VDC ~ 370VDC |
|    |                           |                                    | I/P:<br>LOW-LINE = 177VAC<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: 180VAC ~ 264VAC<br>O/P: FULL-MIN LOAD<br>Ta: 25°C  | TEST: OK                               |
| 3  | INPUT CURRENT (TYP.)      | 0.22 / 230VAC                      | I/P: 230VAC<br>O/P: FULL LOAD<br>TA: 25°C   | I= 0.1854 / 230VAC                     |
| 4  | LEAKAGE CURRENT           | < 1.00mA                           | I/P: 240VAC<br>O/P: MIN LOAD<br>TA: 25°C  | L-FG: 0.2297 mA<br>N-FG: 0.2286 mA     |
| 5  | NO LOAD POWER CONSUMPTION | < 0.50W                            | I/P: 230VAC<br>O/P: MIN LOAD<br>TA: 25°C  | < 0.3822 W                             |



### PROTECTION FUNCTION TEST

| NO | TEST ITEM               | SPECIFICATION                          | TEST CONDITION   | RESULT  |
|----|-------------------------|--|--|---|
| 1  | OVER LOAD PROTECTION    | 205% ~ 235%                            | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 180VAC<br>O/P: TESTING<br>TA: 25°C  | 216% 264VAC<br>217% 230VAC<br>216% 180VAC<br>Constant Current Limiting    |
| 2  | OVER VOLTAGE PROTECTION | 33.00V ~ 35.00V                        | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 180VAC<br>O/P: MIN LOAD<br>TA: 25°C | 33.80V 264VAC<br>33.80V 230VAC<br>33.80V 180VAC<br>Shut down Re- power ON |
| 3  | SHORT PROTECTION        | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 264VAC<br>I/P: 180VAC<br>O/P: FULL LOAD<br>Ta: 25°C               | NO DAMAGE<br>Constant Current Limiting                                    |

### COMPONENT STRESS TEST

| NO | TEST ITEM            | SPECIFICATION                      | TEST CONDITION   | RESULT  |
|----|----------------------|------------------------------------|--|---|
| 1  | PWM Power Transistor | Q1 Rated: 600V 11.0A               | I/P: 267VAC<br>VDS :<br>O/P: (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta: 25°C             | Q1<br>VIN: 267VAC<br>(1). 490.00V<br>(2). 490.00V<br>(3). 488.00V             |
| 2  | O/P Diode (MOSFET)   | D100 Rated: 300V 20A               | I/P: 267VAC<br>VDS :<br>O/P: (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta: 25°C             | D100<br>VDS :<br>(1). 191.00V<br>(2). 244.00V<br>(3). 191.00V                 |
| 3  | Input Capacitor      | C5 Rated: 150uf 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 | C5<br>(1). 368.00V<br>(2). 368.00V<br>(3). 370.00V                            |
| 4  | Control IC           | U1 Rated: 28V (max)<br>10.5V (min) | I/P: 267VAC<br>O/P: (1)Full Load<br>(2)Output Short<br>Change<br>(4)O.V.P<br>(5)Low Line No Load Vo(min)<br>Ta: 25°C   | U1<br>(1). 12.80V<br>(2). 12.30V<br>(3). 12.60V<br>(4). 13.80V<br>(5). 12.40V |
| 5  | O/P Diode (MOSFET)   | Q102 Rated: 40V 100A               | I/P: 267VAC<br>VDS :<br>O/P: (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta: 25°C             | Q102<br>VIN: 267VAC<br>(1). 30.40V<br>(2). 2.00V<br>(3). 29.60V               |
| 6  | Clamp Diode          | D3 Rated: 800V 2.0A                | I/P: 267VAC<br>O/P: (1)Dynamic Load Full/Min Load 90%Duty/1KHz<br>(2)Full load continue<br>Ta: 25°C                    | (1). 464.00V<br>(2). 460.00V  |

### ■ SAFETY & E.M.C. TEST

#### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION   | TEST CONDITION  | RESULT   |
|----|----------------------|---|---|--|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 4.000KVAC /min<br>I/P-FG: 2.000KVAC /min<br>O/P-FG: 0.600KVAC /min | I/P-O/P: 4.400KVAC /min<br>I/P-FG: 2.400KVAC /min<br>O/P-FG: 0.720KVAC /min<br>Ta: 25°C | I/P-O/P: 2.46mA<br>I/P-FG: 1.48mA<br>O/P-FG: 1.37mA<br>NO DAMAGE |
| 2  | ISOLATION RESISTANCE | I/P-O/P: 500VDC>100MΩ<br>I/P-FG: 500VDC>100MΩ                               | I/P-O/P: 500VDC<br>I/P-FG: 500VDC<br>Ta: 25°C/70%RH                                     | I/P-O/P: 9999MΩ<br>I/P-FG: 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 | EN50491-5-2<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  | EN50491-5-2<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: 1KV; L/N-PE:2KV   | I/P: 230VAC /50HZ<br>O/P: FULL LOAD<br>Ta: 25°C            | CRITERIA A                    |

### ※ PSU TEST

| NO | TEST ITEM                                | SPECIFICATION                   | TEST CONDITION                                 | RESULT  |
|----|--|---------------------------------|--|---|
| 1  | O/P VOLTAGE                              | <p>Figure 5: Test Setup U/I</p> | I/P: 230VAC<br>I/P: 180VAC<br>O/P: 0.71A<br>0A | Vo= 29.885 V 230V /0.71A<br>Vo= 29.892 V 230V /0A<br>Vo= 29.892 V 180V / 0.71A<br>Vo= 29.898 V 180V /0A |
| 2  | RIPPLE NOISE                             |                                 | I/P: 230VAC<br>I/P: 180VAC<br>O/P: FULL LOAD   | Vo= 80 mV 230V FULL LOAD<br>Vo= 85.6 mV 180V FULL LOAD  |
| 3  | Two products in parallel leakage current |                                 | I/P: 230VAC<br>I/P: 180VAC<br>O/P: NO LOAD     | I= 8.01 mA 230V NO LOAD<br>I= 8 mA 180V NO LOAD   |
| 4  | Dynamic test                             |                                 | I/P: 230VAC<br>I/P: 180VAC<br>O/P: R2=140Ω     | Vo= 200 mV 230V<br>Vo= 201 mV 180V  |
| 5  | Hold up time test                        |                                 | I/P: 230VAC<br>O/P: FULL LOAD<br>NO LOAD       | 264.72 ms / 230V  |
| 6  | V/I test                                 |                                 | I/P: 230VAC<br>I/P: 180VAC<br>O/P: TESTING     | Vo=1.5V 1.4 A / 230V<br>Vo=29.7V 1.38 A / 230V<br>Vo=1.5V 1.4 A / 180V<br>Vo=29.7V 1.38 A / 180V        |

### ※ CHOKE TEST

| NO | TEST ITEM                    | SPECIFICATION  | TEST CONDITION   | RESULT  |
|----|------------------------------|--|--|---|
| 1  | Steady state parameters test | <p>test</p>  | I/P: 230VAC<br>I/P: 180VAC<br>O/P: 0.71A   | 1 $U_{CB} = 0.3784$ V<br>$U_{DA} = 0.376$ V<br><br>2 NO DAMAGE<br>$I_N = 1.4$ A   |
| 2  | Dynamic test                 | <p>Generator function: Pulse period: 104us pulsewidth: 35us</p> <p><math>R_2 = 220\Omega</math>, <math>R_1 = (U_P / I_N) * 0.9 (40\Omega)</math>, <math>L_1 = 4.8</math> mH (at rated DC current), <math>R_i &lt; 2\Omega</math><br/>           judgment: waveform as left</p> | I/P: 230VAC<br>I/P: 180VAC<br>O/P: FULL LOAD<br>NO LOAD  | S1 OPEN 180V 230V<br>A= 31 V 30.9 V<br>B= 23.7 V 23.5 V<br>C= 24.6 V 24.9 V<br>D= 34.8 V 34.8 V<br>IP= 0.11 A 0.104 A<br><br>S1 CLOSE<br>A= 29.5 V 29.4 V<br>B= 23.1 V 23 V<br>C= 25.3 V 25.4 V<br>D= 35.8 V 29.4 V<br>IP= 0.112 A 0.11 A |
| 3  | Reset test                   |  | I/P: 230VAC<br>I/P: 180VAC<br>O/P: 3A<br><br>U <sub>AUX</sub> shall be tuned to 10V DC ; R = 3,3 $\Omega$ ( I $\approx$ 3A ) when reset on/off<br>judgment:<br>U <sub>psu</sub> : $\geq 28$ V<br>U <sub>aux</sub> : $\leq 0.5$ V<br>LED turn red(Reset), Choke no damage | U <sub>PSU</sub> = 29.853 V<br>U <sub>AUX</sub> = 0.09 V<br>LED red   |

### ■ RELIABILITY TEST

| NO  | TEST ITEM              | SPECIFICATION  | TEST CONDITION   | RESULT  |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
|-----|------------------------|--|--|---|-----|----------|------------------------------------|--------------------------------------|---|-----|--------|--------|---|-----|--------|--------|---|----|--------|--------|---|-----|--------|--------|---|----|--------|--------|---|--------|--------|--------|---|---------|--------|--------|---|------|--------|--------|---|----|--------|--------|----|------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|------|--------|--------|
| 1   | TEMPERATURE RISE TEST  | MODEL: KNX-20E<br>1. ROOM AMBIENT BURN-IN: 1.0hrs<br>IP: 230VAC      O/P: 100% LOAD      TA= 15.0°C<br>2. HIGH AMBIENT BURN-IN: 1.0hrs<br>IP: 230VAC      O/P: 100% LOAD      TA= 50.6°C | ROOM AMBIENT T <sub>a</sub> 15.0°C      HIGH AMBIENT T <sub>a</sub> : 50.6°C | <table border="1"> <thead> <tr> <th>NO.</th> <th>Position</th> <th>ROOM AMBIENT T<sub>a</sub> 15.0°C</th> <th>HIGH AMBIENT T<sub>a</sub>: 50.6°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>34.7°C</td><td>68.0°C</td></tr> <tr><td>2</td><td>BD1</td><td>33.9°C</td><td>68.3°C</td></tr> <tr><td>3</td><td>C5</td><td>32.7°C</td><td>67.6°C</td></tr> <tr><td>4</td><td>C35</td><td>38.4°C</td><td>71.7°C</td></tr> <tr><td>5</td><td>Q1</td><td>49.9°C</td><td>85.9°C</td></tr> <tr><td>6</td><td>T1 BOB</td><td>52.9°C</td><td>85.2°C</td></tr> <tr><td>7</td><td>T1 COIL</td><td>55.1°C</td><td>88.1°C</td></tr> <tr><td>8</td><td>D100</td><td>63.7°C</td><td>96.8°C</td></tr> <tr><td>9</td><td>U1</td><td>54.1°C</td><td>87.6°C</td></tr> <tr><td>10</td><td>C105</td><td>55.7°C</td><td>88.9°C</td></tr> <tr><td>11</td><td>RTH3</td><td>50.4°C</td><td>84.1°C</td></tr> <tr><td>12</td><td>L100</td><td>50.8°C</td><td>83.8°C</td></tr> <tr><td>13</td><td>T100</td><td>52.9°C</td><td>87.9°C</td></tr> <tr><td>14</td><td>Q101</td><td>43.8°C</td><td>69.5°C</td></tr> <tr><td>15</td><td>Q102</td><td>45.0°C</td><td>68.6°C</td></tr> </tbody> </table> | NO. | Position | ROOM AMBIENT T <sub>a</sub> 15.0°C | HIGH AMBIENT T <sub>a</sub> : 50.6°C | 1 | LF1 | 34.7°C | 68.0°C | 2 | BD1 | 33.9°C | 68.3°C | 3 | C5 | 32.7°C | 67.6°C | 4 | C35 | 38.4°C | 71.7°C | 5 | Q1 | 49.9°C | 85.9°C | 6 | T1 BOB | 52.9°C | 85.2°C | 7 | T1 COIL | 55.1°C | 88.1°C | 8 | D100 | 63.7°C | 96.8°C | 9 | U1 | 54.1°C | 87.6°C | 10 | C105 | 55.7°C | 88.9°C | 11 | RTH3 | 50.4°C | 84.1°C | 12 | L100 | 50.8°C | 83.8°C | 13 | T100 | 52.9°C | 87.9°C | 14 | Q101 | 43.8°C | 69.5°C | 15 | Q102 | 45.0°C | 68.6°C |
| NO. | Position               | ROOM AMBIENT T <sub>a</sub> 15.0°C   | HIGH AMBIENT T <sub>a</sub> : 50.6°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 1   | LF1                    | 34.7°C   | 68.0°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 2   | BD1                    | 33.9°C   | 68.3°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 3   | C5                     | 32.7°C   | 67.6°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 4   | C35                    | 38.4°C   | 71.7°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 5   | Q1                     | 49.9°C   | 85.9°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 6   | T1 BOB                 | 52.9°C   | 85.2°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 7   | T1 COIL                | 55.1°C   | 88.1°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 8   | D100                   | 63.7°C   | 96.8°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 9   | U1                     | 54.1°C   | 87.6°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 10  | C105                   | 55.7°C   | 88.9°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 11  | RTH3                   | 50.4°C   | 84.1°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 12  | L100                   | 50.8°C   | 83.8°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 13  | T100                   | 52.9°C   | 87.9°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 14  | Q101                   | 43.8°C   | 69.5°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 15  | Q102                   | 45.0°C   | 68.6°C   |   |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |
| 2   | OVER LOAD BURN-IN TEST | NO DAMAGE<br>1 HOUR ( MIN )  | I/P: 230VAC<br>O/P: 192.00% LOAD<br>Ta: 25°C                                 | TEST: OK  |     |          |                                    |                                      |   |     |        |        |   |     |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |        |        |        |   |         |        |        |   |      |        |        |   |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |



|    |  |   |  |          |
|----|--|---|--|----------|
| 3  | LOW TEMPERATURE<br>TURN ON TEST                        | NO DAMAGE<br>1 HOUR ( MIN )   | I/P: 264VAC / 180VAC<br>O/P: FULL LOAD<br>Ta: -30.0°C                          | TEST: OK |
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 50°C<br>NO DAMAGE  | I/P: 272VAC<br>O/P: FULL LOAD<br>Ta: 50°C<br>HUMIDITY= 95.0% RH                | TEST: OK |
| 5  | STORAGE<br>TEMPERATURE TEST                            | 1. Thermal shock Temperature: -40°C ~ +85°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle: 5 CYCLE<br>5. Input/Output condition: STATIC   |  | TEST: OK |
| 6  | THERMAL SHOCK TEST                                     | 1. Thermal shock Temperature: -35°C ~ +55°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle: 10 CYCLE<br>5. Input/Output condition:<br>230VAC Full Load AC ON/OFF test turn on 58sec; turn off 2sec |  | TEST: OK |
| 7  | VIBRATION TEST   | 1 Carton & 1 Set<br>(1) Waveform: Sine Wave<br>(2) Frequency: 10~500Hz<br>(4) Acceleration: 2G<br>(5) Test Time: 60 min in each axis (X.Y.Z)<br>(6) Ta: 25°C  |  | TEST: OK |
| 8  | CAPACITOR LIFE CYCLE                                   | :SUPPOSE C105 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). 186994.8 HRS<br>(2). 39018.6 HRS<br>(3). 81350.1 HRS<br>(4). 151902.6 HRS |          |
| 9  | MTBF   | 1899.9K hrs min. Telcordia SR-332 (Bellcore) ; 416.5K hrs min. MIL-HDBK-217F (25°C)   |  |          |
| 10 | DMTBF /Accelerated Life test                           | Demonstration Mean Time Between Failure (Expected Life): Above 30000HRS @ TA 50°C<br>O/P: FULL LOAD   |  |          |

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

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