



# Test Report: ERPF-400-12

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400W 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 TEST

| NO   | TEST ITEM  | SPECIFICATION                    | TEST CONDITION   | RESULT                             |
|--|--|----------------------------------|--|------------------------------------|
| 1  | OUTPUT VOLTAGE ADJUST RANGE<br>(For A-Type only) | 10.8V~13.2V                      | I/P: 230VAC<br>O/P: NO LOAD<br>Ta: 25°C                    | 10.13V~ 13.47 V                    |
| 2  | OUTPUT VOLTAGE TOLERANCE                         | -1%~+1%                          | I/P: 90VAC / 264VAC<br>O/P: FULL/ NO LOAD<br>Ta: 25°C      | -0.41%~ 0.41%                      |
| 3  | LINE REGULATION                                  | -0.5%~+0.5%                      | I/P: 200VAC ~ 264VAC<br>O/P: FULL LOAD<br>Ta: 25°C         | -0.14 %~ 0.305 %                   |
| 4  | LOAD REGULATION                                  | -0.5%~+0.5%                      | I/P: 230VAC<br>O/P: FULL ~NO LOAD<br>Ta: 25°C              | -0.138%~ 0.306 %                   |
| 5  | OVER/UNDERSHOOT TEST                             | <± 5 %                           | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C                  | <5 %                               |
| 6  | RIPPLE & NOISE (Max)                             | 150mVp-p                         | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C                  | 37 mVp-p                           |
| <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>high frequency :</p> </div> <div style="width: 45%;"> <p>low frequency :</p> </div> </div>  |  |                                  |  |                                    |
| 7  | SET UP TIME(Max)                                 | 230VAC/ 2000ms<br>115VAC/ 3000ms | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P: FULL LOAD<br>Ta: 25°C | 230VAC/ 520 ms<br>115VAC/ 672 ms   |
| <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> </div> <div style="width: 45%;"> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> </div> </div> |  |                                  |  |                                    |
| 8  | RISE TIME (Max)                                  | 230VAC/ 100ms<br>115VAC/ 100ms   | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P: FULL LOAD<br>Ta: 25°C | 230VAC/ 68.0 ms<br>115VAC/ 66.8 ms |

|  |  |   |  |
|--|--|---|--|
| <p>INPUT=230VAC/50HZ @ FULL LOAD<br/>CH1: Output Voltage</p>                       | <p>INPUT=115VAC/60HZ @ FULL LOAD<br/>CH1: Output Voltage</p>                       |   |  |
| <p>9 HOLD UP TIME(Typ)</p>   | <p>230VAC/ 10ms<br/>115VAC/ 10ms</p>   | <p>I/P: 230 VAC<br/>I/P: 115 VAC<br/>O/P: FULL LOAD<br/>Ta: 25°C</p>  | <p>230VAC/ 14.4 ms<br/>115VAC/ 14.4 ms</p> |
| <p>INPUT=230VAC/50HZ @ FULL LOAD<br/>CH1: Output Voltage CH2: AC Input Voltage</p> | <p>INPUT=115VAC/60HZ @ FULL LOAD<br/>CH1: Output Voltage CH2: AC Input Voltage</p> |   |  |
| <p>10 DYNAMIC LOAD</p>   | <p>V1: 1200 mVp-p</p>  | <p>I/P: 230VAC<br/>O/P:<br/>(1)FULL/50% LOAD 50%DUTY / 120HZ<br/>(2)FULL/50% LOAD 50%DUTY / 1KHZ<br/>Ta: 25°C</p> | <p>(1) 880mVp-p<br/>(2) 548mVp-p</p>       |
| <p>FULL /50% LOAD 50%DUTY / 120HZ</p>  | <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>   |   |  |

## INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                          | TEST CONDITION  | RESULT                                   |
|----|-----------------------|--|---|--|
| 1  | INPUT VOLTAGE RANGE   | 90VAC~264VAC                           | I/P: TESTING<br>O/P: FULL LOAD<br>Ta: 25°C  | 87 V~ 300 V                              |
|    |                       |  | I/P: LOW-LINE-3V=87 V<br>HIGH-LINE+15%=300 V<br>O/P: FULL/NO LOAD<br>ON: 30 Sec OFF: 30 Sec 10MIN<br>( POWER ON/OFF NO DAMAGE )   | TEST: OK                                 |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE               | I/P: 90 VAC ~264 VAC<br>O/P: FULL~NO LOAD<br>Ta: 25°C   | TEST: OK                                 |
| 3  | AC CURRENT            | 3.0A/115VAC<br>2.5A/230VAC             | I/P: 115 VAC<br>I/P: 230 VAC<br>O/P: FULL LOAD/50% LOAD<br>Ta: 25°C   | I = 1.59 A/ 115VAC<br>I = 1.07 A/ 230VAC |
| 4  | LEAKAGE CURRENT       | < 1mA / 240VAC                         | I/P: 240 VAC<br>O/P: NO LOAD<br>Ta: 25°C  | L-FG: 0.448 mA<br>N-FG: 0.345 mA         |
| 5  | INRUSH CURRENT(Typ)   | 45A/115VAC<br>90A/230VAC<br>COLD START | I/P: 115 VAC<br>I/P: 230 VAC<br>O/P: FULL LOAD/50% LOAD<br>Ta: 25°C   | I = 42.4 A/ 115VAC<br>I = 84.0 A/ 230VAC |
|    |                       |  | <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH2: Input current CH1: AC Input Voltage</p> <p>17 8月 2016 15:22:13</p> </div> <div style="width: 45%;"> <p>INPUT=115VAC/50HZ @ 50% LOAD</p> <p>CH2: Input current CH1: AC Input Voltage</p> <p>17 8月 2016 15:24:07</p> </div> </div> |  |
| 6  | EFFICIENCY(Typ)       | 89%                                    | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C   | 90.33 %                                  |
| 7  | POWER FACTOR          | 0.98/ 115VAC<br>0.95/ 230VAC           | I/P: 115 VAC<br>I/P: 230 VAC<br>O/P: FULL LOAD/50% LOAD<br>Ta: 25°C   | PF= 0.995 / 115VAC<br>PF= 0.985 / 230VAC |

**PROTECTION FUNCTION TEST**

| NO | TEST ITEM                   | SPECIFICATION                             | TEST CONDITION  | RESULT   |
|----|-----------------------------|---|---|--|
| 1  | OVER CURRENT PROTECTION     | 105%~135%                                 | I/P: 200VAC<br>I/P: 230VAC<br>I/P: 264VAC<br>O/P: TESTING<br>Ta: 25°C | 118.9 %/ 200VAC<br>120.2 %/ 230VAC<br>121.2%/ 264VAC<br>Constant Current Limiting, recovers automatically after fault condition is removed |
| 2  | OVER VOLTAGE PROTECTION     | 13.8V~16.2V                               | I/P: 90VAC<br>I/P: 230VAC<br>I/P: 264VAC<br>O/P: NO LOAD<br>Ta: 25°C  | 14.67 V/ 90VAC<br>14.67 V/ 230VAC<br>14.67 V/ 264VAC<br>Shut down o/p voltage, re-power on to recovery                                     |
| 3  | OVER TEMPERATURE PROTECTION | NO DAMAGE                                 | I/P: 200VAC<br>I/P: 230VAC<br>I/P: 264VAC<br>O/P: FULL LOAD           | O.T.P. Active<br>Shut down o/p voltage, recovers automatically after temperature goes down   |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR<br>NO DAMAGE | I/P: 90VAC<br>I/P: 264VAC<br>O/P: FULL LOAD<br>Ta: 25°C               | NO DAMAGE<br>Constant Current Limiting, recovers automatically after fault condition is removed  |

**COMPONENT STRESS TEST**

| NO | TEST ITEM            | SPECIFICATION           | TEST CONDITION   | RESULT   |
|----|----------------------|-------------------------|--|--|
| 1  | PWM Power Transistor | Q 2 Rated<br>600V/20A   | I/P: High-Line +3V =267V<br>O/P: (1) FULL LOAD Turn on<br>(2) Output Short<br>(3) FULL LOAD continue<br>Ta: 25°C                           | (1) 440 V<br>(2) 488 V<br>(3) 436 V                                |
| 2  | O/P Diode (MOSFET)   | Q101 Rated<br>100V/60A  | I/P: High-Line +3V =267V<br>O/P: (1) FULL LOAD Turn on<br>(2) Output Short<br>(3) FULL LOAD continue<br>Ta: 25°C                           | (1) 51.2 V<br>(2) 55.2 V<br>(3) 60.0 V                             |
| 3  | Input Capacitor      | C5 Rated<br>180u/ 400V  | I/P: High-Line +3V =267 V<br>O/P: (1) FULL LOAD input on/off<br>(2) NO LOAD input on /Off<br>(3) FULL LOAD /NO LOAD<br>Change<br>Ta: 25°C  | (1) 392 V<br>(2) 384 V<br>(3) 388 V                                |
| 4  | Control IC           | U1 Rated<br>30V (MAX.)  | I/P: High-Line +3V =267 V<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 | (1) 16.3 V<br>(2) 16.7 V<br>(3) 16.3 V<br>(4) 16.3 V<br>(5) 15.9 V |
| 5  | PFC Power Transistor | Q 6 Rated<br>600V/23.8A | I/P: High-Line +3V =267V<br>O/P: (1) FULL LOAD Turn on<br>(2) Output Short<br>(3) FULL LOAD continue<br>Ta: 25°C                           | (1) 512 V<br>(2) 384 V<br>(3) 496 V                                |

**SAFETY TEST**

| NO | TEST ITEM            | SPECIFICATION   | TEST CONDITION   | RESULT   |
|----|----------------------|---|--|--|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 3.0KVAC/min<br>I/P-FG: 2.0KVAC/min<br>O/P-FG: 0.5KVAC/min    | I/P-O/P: 3.6KVAC/min<br>I/P-FG: 2.4 KVAC/min<br>O/P-FG: 0.6 KVAC/min<br>Ta: 25°C | I/P-O/P: 3.110 mA<br>I/P-FG: 2.954 mA<br>O/P-FG: 2.110 mA<br>NO DAMAGE |
| 2  | ISOLATION RESISTANCE | I/P-O/P: 500VDC>100MΩ<br>I/P-FG: 500VDC>100MΩ<br>O/P-FG: 500VDC>100MΩ | I/P-O/P: 500 VDC<br>I/P-FG: 500 VDC<br>O/P-FG: 500 VDC<br>Ta: 25°C               | I/P-O/P: >9999 MΩ<br>I/P-FG: >9999 MΩ<br>O/P-FG: >9999 MΩ              |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                                | 40A / 2min<br>Ta:25°C  | 13 mΩ  |

**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  | I/P: 230 VAC (50HZ)<br>O/P: FULL LOAD<br>Ta: 25°C                         | PASS<br>Test by certified Lab |
| 3  | RADIATION                                   | EN55022  | I/P: 230 VAC (50HZ)<br>O/P: FULL LOAD<br>Ta: 25°C                         | PASS<br>Test by certified Lab |
| 4  | SURGE                                       | EN61000-4-5<br>LIGHT INDUSTRY<br>L-N: 1KV<br>L,N-PE: 2KV | I/P: 230VAC/50HZ<br>O/P: FULL LOAD<br>L-N: 1KV<br>L,N-PE: 2KV<br>Ta: 25°C | CRITERIA A                    |
| 5  | Test by certified Lab & Test Report Prepare |  |   |                               |

■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

| NO | TEST ITEM   | SPECIFICATION   | TEST CONDITION  | RESULT   |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
|----|---|---|---|--|----|----------|-------------------------|-------------------------|---|-----|--------|---------|---|------|---------|---------|---|----|---------|---------|---|----|---------|---------|---|----|---------|---------|---|----|---------|---------|---|----|---------|---------|---|----|---------|---------|---|-----|--------|---------|----|----|---------|---------|----|----|--------|--------|----|------|---------|---------|----|------|---------|---------|----|------|---------|---------|----|------|---------|---------|----|------|--------|--------|----|------|--------|--------|----|-----|---------|---------|----|------|--------|--------|
| 1  | TEMPERATURE RISE TEST   | MODEL: ERPF-400-12<br>1. ROOM AMBIENT BURN-IN: 2 HRS<br>I/P: 230VAC O/P: FULL LOAD Ta=34.3 °C<br>2. HIGH AMBIENT BURN-IN: 2 HRS<br>I/P: 230VAC O/P: FULL LOAD Ta=35.1 °C  |   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
|    |   |   |   | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=34.3 °C</th> <th>HIGH AMBIENT Ta=35.1 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>98.1°C</td><td>101.0°C</td></tr> <tr><td>2</td><td>RTH1</td><td>113.2°C</td><td>115.2°C</td></tr> <tr><td>3</td><td>L1</td><td>115.2°C</td><td>119.4°C</td></tr> <tr><td>4</td><td>Q6</td><td>112.6°C</td><td>116.0°C</td></tr> <tr><td>5</td><td>C5</td><td>100.1°C</td><td>103.2°C</td></tr> <tr><td>6</td><td>Q1</td><td>104.5°C</td><td>107.1°C</td></tr> <tr><td>7</td><td>Q2</td><td>107.8°C</td><td>110.4°C</td></tr> <tr><td>8</td><td>D6</td><td>106.4°C</td><td>109.7°C</td></tr> <tr><td>9</td><td>C35</td><td>97.0°C</td><td>100.0°C</td></tr> <tr><td>10</td><td>T1</td><td>111.7°C</td><td>115.1°C</td></tr> <tr><td>11</td><td>U1</td><td>96.3°C</td><td>99.2°C</td></tr> <tr><td>12</td><td>Q101</td><td>107.1°C</td><td>110.5°C</td></tr> <tr><td>13</td><td>Q102</td><td>109.3°C</td><td>112.1°C</td></tr> <tr><td>14</td><td>Q103</td><td>104.4°C</td><td>106.7°C</td></tr> <tr><td>15</td><td>L100</td><td>116.8°C</td><td>120.2°C</td></tr> <tr><td>16</td><td>C122</td><td>96.0°C</td><td>98.9°C</td></tr> <tr><td>17</td><td>C106</td><td>91.2°C</td><td>93.8°C</td></tr> <tr><td>18</td><td>R17</td><td>111.8°C</td><td>115.1°C</td></tr> <tr><td>19</td><td>TSW1</td><td>90.7°C</td><td>92.4°C</td></tr> </tbody> </table> | NO | Position | ROOM AMBIENT Ta=34.3 °C | HIGH AMBIENT Ta=35.1 °C | 1 | BD1 | 98.1°C | 101.0°C | 2 | RTH1 | 113.2°C | 115.2°C | 3 | L1 | 115.2°C | 119.4°C | 4 | Q6 | 112.6°C | 116.0°C | 5 | C5 | 100.1°C | 103.2°C | 6 | Q1 | 104.5°C | 107.1°C | 7 | Q2 | 107.8°C | 110.4°C | 8 | D6 | 106.4°C | 109.7°C | 9 | C35 | 97.0°C | 100.0°C | 10 | T1 | 111.7°C | 115.1°C | 11 | U1 | 96.3°C | 99.2°C | 12 | Q101 | 107.1°C | 110.5°C | 13 | Q102 | 109.3°C | 112.1°C | 14 | Q103 | 104.4°C | 106.7°C | 15 | L100 | 116.8°C | 120.2°C | 16 | C122 | 96.0°C | 98.9°C | 17 | C106 | 91.2°C | 93.8°C | 18 | R17 | 111.8°C | 115.1°C | 19 | TSW1 | 90.7°C | 92.4°C |
| NO | Position  | ROOM AMBIENT Ta=34.3 °C   | HIGH AMBIENT Ta=35.1 °C                                       |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 1  | BD1   | 98.1°C  | 101.0°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 2  | RTH1  | 113.2°C   | 115.2°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 3  | L1  | 115.2°C   | 119.4°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 4  | Q6  | 112.6°C   | 116.0°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 5  | C5  | 100.1°C   | 103.2°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 6  | Q1  | 104.5°C   | 107.1°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 7  | Q2  | 107.8°C   | 110.4°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 8  | D6  | 106.4°C   | 109.7°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 9  | C35   | 97.0°C  | 100.0°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 10 | T1  | 111.7°C   | 115.1°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 11 | U1  | 96.3°C  | 99.2°C  |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 12 | Q101  | 107.1°C   | 110.5°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 13 | Q102  | 109.3°C   | 112.1°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 14 | Q103  | 104.4°C   | 106.7°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 15 | L100  | 116.8°C   | 120.2°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 16 | C122  | 96.0°C  | 98.9°C  |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 17 | C106  | 91.2°C  | 93.8°C  |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 18 | R17   | 111.8°C   | 115.1°C   |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 19 | TSW1  | 90.7°C  | 92.4°C  |  |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 2  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR  | I/P: 264VAC/90VAC<br>O/P: FULL LOAD/50% LOAD<br>Ta= -35°C     | TEST: OK   |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 3  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 35°C<br>NO DAMAGE  | I/P: 264VAC<br>O/P: FULL LOAD<br>Ta=35°C<br>HUMIDITY= 95 %R.H | TEST: OK   |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 4  | TEMPERATURE<br>COEFFICIENT  | ±0.1 %/°C (0~35°C)  | I/P: 230 VAC<br>O/P: FULL LOAD                                | ±0.021 %/°C (0~35°C)   |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |
| 5  | STORAGE TEMPERATURE TEST  | 1. Thermal shock Temperature: -35°C ~ +90°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle: 5 CYCLE<br>5. Input/Output condition: STATIC |   | TEST: OK   |    |          |                         |                         |   |     |        |         |   |      |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |    |         |         |   |     |        |         |    |    |         |         |    |    |        |        |    |      |         |         |    |      |         |         |    |      |         |         |    |      |         |         |    |      |        |        |    |      |        |        |    |     |         |         |    |      |        |        |



|   |                      |  |  |
|---|----------------------|--|--|
| 6 | THERMAL SHOCK TEST   | 1. Thermal shock Temperature: -35°C~+40°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: 230VAC/FULL LOAD AC ON/OFF TEST<br>AC on 3 sec/AC off 1 sec TEST   | TEST: OK   |
| 7 | VIBRATION TEST       | 1 Carton & 1 Set<br>(1) Waveform: Sine Wave<br>(2) Frequency: 10~500Hz<br>(3) Sweep Time: 10min/sweep cycle<br>(4) Acceleration: 3G<br>(5) Test Time: 60min in each axis (X.Y.Z)<br>(6) Ta: 25°C   | TEST: OK   |
| 8 | CAPACITOR LIFE CYCLE | ERPF-400-12: SUPPOSE C102 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= 35 °C LIFE TIME<br>(3) I/P: 230VAC O/P: 75% LOAD Ta= 35 °C LIFE TIME<br>(4) I/P: 230VAC O/P: 50% LOAD Ta= 35 °C LIFE TIME | (1) 71374 HRS<br>(2) 31514 HRS<br>(3) 102275 HRS<br>(4) 226259 HRS |
| 9 | MTBF                 | Conducted by Parts Stress Analysis Prediction<br>1981.2K hrs min. Telcordia SR-332 (Bellcore) ; 233.4K hrs min. MIL-HDBK-217F (25°C)   |  |

| TEST RESULT | TESTER        | REVIEW | APPROVAL |
|-------------|---------------|--------|----------|
| PASS        | CHENZH/ZHUOKB | SKY    | LIUWY    |