



# Test Report: MSP-450-12

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## 450W Single Output Medical Type

### ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

### ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

### ■ RELIABILITY TEST

ENVIRONMENT TEST

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

| NO | TEST ITEM                      | SPECIFICATION                                   | TEST CONDITION                                                                                                        | RESULT                                                     | VERDICT |
|----|--------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------|
| 1  | RIPPLE & NOISE                 | V1 : 120 mVp-p (Max )                           | I/P : 230VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                          | V1 : 45.4 mVp-p (Max )                                     | P       |
| 2  | OUTPUT VOLTAGE<br>ADJUST RANGE | CH1 : 10.2V ~ 13.8 V                            | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C                                                         | 9.308 V ~ 14.757 V/ 230 VAC<br>9.302 V ~ 14.755 V/ 115 VAC | P       |
| 3  | OUTPUT VOLTAGE<br>TOLERANCE    | V1 : 1 %~ -1 % (Max)                            | I/P : 100 VAC / 264 VAC<br>O/P : FULL/ MIN LOAD<br>Ta : 25°C                                                          | V1 : 0.3 %~ -0.3 %                                         | P       |
| 4  | LINE REGULATION                | V1 : 0.3%~-0.3 % (Max)                          | I/P : 100 VAC ~ 264 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                               | V1 : 0.1 %~ -0.1 %                                         | P       |
| 5  | LOAD REGULATION                | V1 : 0.5 %~ -0.5 % (Max)                        | I/P : 230 VAC<br>O/P : FULL ~MIN LOAD<br>Ta : 25°C                                                                    | V1 : 0.3 %~ -0.3 %                                         | P       |
| 6  | SET UP TIME                    | 230VAC : 1000 ms (Max)<br>115VAC : 2500 ms(Max) | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                        | 230VAC/ 124 ms<br>115VAC/ 248 ms                           | P       |
| 7  | RISE TIME                      | 230VAC : 100 ms (Max)<br>115VAC : 100 ms (Max)  | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                        | 230VAC/ 25 ms<br>115VAC/ 22 ms                             | P       |
| 8  | HOLD UP TIME                   | 230VAC : 16 ms (TYP)<br>115VAC : 16 ms (TYP)    | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                        | 230VAC/ 22 ms<br>115VAC/ 17 ms                             | P       |
| 9  | OVER/UNDERSHOOT<br>TEST        | < ±5%                                           | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                         | TEST : <5 %                                                | P       |
| 10 | DYNAMIC LOAD                   | V1 : 1200 mVp-p                                 | I/P : 230 VAC<br>(1).O/P : FULL /Min LOAD 90%DUTY/<br>1KHZ<br>(2).O/P : FULL /Min LOAD 50%DUTY/<br>120HZ<br>Ta : 25°C | (1). 474 mVp-p<br>(2). 477 mVp-p                           | P       |

## INPUT FUNCTION TEST

| NO | TEST ITEM                 | SPECIFICATION                                      | TEST CONDITION                                                                                                                                | RESULT                                               | VERDICT |
|----|---------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------|
| 1  | INPUT VOLTAGE RANGE       | 100VAC~264 VAC                                     | I/P : TESTING<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                 | 72 V~264V                                            | P       |
|    |                           |                                                    | I/P :<br>LOW-LINE-3V= 97 V<br>HIGH-LINE+15%=300 V<br>O/P : FULL/MIN LOAD<br>ON : 30 Sec . OFF : 30 Sec 10MIN<br>( AC POWER ON/OFF NO DAMAGE ) | TEST : OK                                            |         |
| 2  | INPUT FREQUENCY RANGE     | 47HZ ~63 HZ<br>NO DAMAGE OSC                       | I/P : 100 VAC ~ 264 VAC<br>O/P : FULL ~MIN LOAD<br>Ta : 25°C                                                                                  | TEST : OK                                            | P       |
| 3  | POWER FACTOR              | 0.95 / 230 VAC(TYP)<br>0.99 / 115 VAC(TYP)         | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                | PF= 0.98 / 230 VAC<br>PF= 0.995 / 115 VAC            | P       |
| 4  | EFFICIENCY                | 88% (TYP)                                          | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                 | 89.34 %                                              | P       |
| 5  | INPUT CURRENT             | 230V/ 2.4 A (TYP)<br>115V/ 5 A (TYP)               | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                | I= 2.26 A/ 230 VAC<br>I= 4.58 A/ 115 VAC             | P       |
| 6  | INRUSH CURRENT            | 230V/ 70 A (TYP)<br>115V/ 35 A (TYP)<br>COLD START | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                | I= 63 A/ 230 VAC<br>I= 27 A/ 115 VAC                 | P       |
| 7  | LEAKAGE CURRENT           | < 300 uA/ for earth leakage current                | I/P: 264 VAC<br>O/P:Min LOAD<br>Ta:25°C                                                                                                       | L-FG 267 uA<br>N-FG 267 uA                           | P       |
|    |                           | < 100 uA/ for touch leakage current                | I/P: 264 VAC<br>O/P:Min LOAD<br>Ta:25°C                                                                                                       | L-V+ 78 uA<br>L-V- 78 uA<br>N-V+ 78 uA<br>N-V- 78 uA |         |
| 8  | No load power consumption | < 0.6 W                                            | I/P : 230 VAC<br>O/P : NO LOAD<br>RC+&RC- SHORT<br>Ta : 25°C                                                                                  | 0.4 W                                                | P       |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                                                                                                                                         | TEST CONDITION                                                | RESULT                                                                                                               | VERDICT |
|----|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------|
| 1  | OVER LOAD PROTECTION        | 105% ~ 135 %                                                                                                                                          | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : TESTING<br>Ta : 25°C  | 113%/ 230 VAC<br>113%/ 115 VAC<br>Constant current limiting, recovers automatically after fault condition is removed | P       |
| 2  | OVER VOLTAGE PROTECTION     | CH1 : 14.4 V ~ 16.8 V                                                                                                                                 | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C | 14.7 V/ 230 VAC<br>14.75 V/ 115 VAC<br>Shut down Re- power ON                                                        | P       |
| 3  | OVER TEMPERATURE PROTECTION | SPEC :<br>TSW1 : 90 ± 5°C O.T.P. detect on heatsink of power transistor<br>TSW2 : 90 ± 5°C O.T.P. detect on heatsink of power transistor<br>NO DAMAGE | I/P : 230 VAC<br>O/P : FULL LOAD                              | O.T.P. Active<br>Shut down o/p voltage , recovers automatically after temperature goes down                          | P       |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE                                                                                                                | I/P : 264 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                 | NO DAMAGE<br>Constant current limiting, recovers automatically after fault condition is removed                      | P       |

## CONTROL FUNCTION TEST

| NO | TEST ITEM                    | SPECIFICATION                                                            | TEST CONDITION                                | RESULT                                       | VERDICT |
|----|------------------------------|--------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------------|---------|
| 1  | DC OK SIGNAL                 | PSU turn on : 3.3 ~ 5.6V ;<br>PSU turn off : 0 ~ 1V                      | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | PSU turn on : 5.05 V<br>PSU turn off : 0 V   | P       |
| 2  | REMOTE CONTROL               | Rc+ / Rc-<br>4 ~ 10V or open = power on<br>0 ~ 0.8V or short = power off | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | 3.7V ~ 10 V POWER ON<br>0V ~ 3.6 V POWER OFF | P       |
| 3  | REMOTE SENSE                 | >0.5V                                                                    | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | > 0.5 V                                      | P       |
| 4  | AUX POWER                    | 4.75V~5.25V / 0.3A<br>Ripple : 50mV                                      | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | 4.958V / 0.3A<br>Ripple : 4mv                | P       |
| 5  | FAN ON/OFF control test(TYP) | 1、FAN ON : 20%± 10%                                                      | I/P : 230 VAC<br>O/P : TESTING<br>Ta : 25°C   | > 22.4%LOAD FAN ON<br>< 16.8 %LOAD FAN OFF   | P       |
|    |                              | 2、RTH2≥ 50°C                                                             | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | 49.1 °C FAN ON                               | P       |

## COMPONENT STRESS TEST

| NO | TEST ITEM                                              | SPECIFICATION                                                                 | TEST CONDITION                                                                                                                               | RESULT                                                                             | VERDICT |
|----|--------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------|
| 1  | Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q3 Rated :<br>IRFP460A 20A/500V                                               | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C                          | (1) 428 V<br>(2) 404 V<br>(3) 402 V                                                | P       |
| 2  | Diode Peak Voltage                                     | Q 101 Rated :<br>STP65NF06 60A/60V<br><br>Q 103Rated :<br>IRFB3607PBF-80A/75V | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br>Ta : 25°C                           | (1) 49.6 V<br>(2) 40.4 V<br>(3) 45.6 V<br><br>(1) 74 V<br>(2) 51.2 V<br>(3) 51.6 V | P       |
| 3  | Input Capacitor Voltage                                | C5 Rated :<br>330u/400V 105°C 30*30 HU                                        | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load<br>Change<br>Ta : 25°C | (1) 372.2 V<br>(2) 376.3 V<br>(3) 376.2 V                                          | P       |
| 4  | Control IC Voltage Test                                | U1 Rated :<br>FAN4801NY 9.3V~30V                                              | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load<br>Change<br>Ta : 25°C | (1) 14.677 V<br>(2) 15.147 V<br>(3) 15.147 V                                       | P       |
| 5  | Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q 1 Rated :<br>IRFP460A 20A/500V                                              | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C                          | (1) 480 V<br>(2) 388 V<br>(3) 408 V                                                | P       |

## SAFETY & E.M.C. TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                            | TEST CONDITION                                                                        | RESULT                                                                | VERDICT |
|----|----------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P : 4 KVAC/min<br>I/P-FG : 2 KVAC/min<br>O/P-FG : 0.5 KVAC/min     | I/P-O/P : 4.2 KVAC/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 : 6.71 mA<br>I/P-FG : 5.59 mA<br>O/P-FG : 4 mA<br>NO DAMAGE   | P       |
| 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 /70%RH         | I/P-O/P : 12.9 GΩ<br>I/P-FG : 15.5 GΩ<br>O/P-FG : 2.2 GΩ<br>NO DAMAGE | P       |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                                   | 40 A / 2min<br>Ta : 25°C / 70%RH                                                      | 9 mΩ                                                                  | P       |

### E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION                                         | TEST CONDITION                                           | RESULT                        | VERDICT |
|----|---------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|-------------------------------|---------|
| 1  | HARMONIC                                    | EN61000-3-2,-3<br>CLASS A<br>CLASS D                  | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | PASS                          | P       |
| 2  | CONDUCTION                                  | EN55022<br>CLASS B                                    | I/P : 230 VAC (50HZ)<br>O/P : FULL/50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab | P       |
| 3  | RADIATION                                   | EN55022<br>CLASS B                                    | I/P : 230 VAC (50HZ)<br>O/P : FULL LOAD<br>Ta : 25°C     | PASS<br>Test by certified Lab | P       |
| 4  | E.S.D                                       | EN61000-4-2<br>INDUSTRY<br>AIR : 8KV / Contact : 4KV  | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    | P       |
| 5  | E.F.T                                       | EN61000-4-4<br>INDUSTRY<br>INPUT : 2KV                | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    | P       |
| 6  | SURGE                                       | IEC61000-4-5<br>INDUSTRY<br>L-N : 2KV<br>L,N-PE : 4KV | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    | P       |
| 7  | Test by certified Lab & Test Report Prepare |                                                       |                                                          |                               |         |

## RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM                                                         | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | TEST CONDITION                                                     | RESULT                    | VERDICT |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
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| 1  | TEMPERATURE RISE TEST                                             | <div>MODEL : MSP-450-5</div> <div>1. ROOM AMBIENT BURN-IN : 1 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta= 27.1 °C</div> <div>2. HIGH AMBIENT BURN-IN : 4.5 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta= 50 °C</div> <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT<br/>Ta= 27.1 °C</th><th>HIGH AMBIENT<br/>Ta= 50 °C</th></tr><tr><td>1</td><td>LF2</td><td>TR548-R2</td><td>56.8°C</td><td>78.9°C</td></tr><tr><td>2</td><td>U1</td><td>PWM FAN4801NY</td><td>51.1°C</td><td>71.5°C</td></tr><tr><td>3</td><td>L3</td><td>TR934</td><td>66.6°C</td><td>89.2°C</td></tr><tr><td>4</td><td>C5</td><td>330u/400V 105°C 30*30 HU</td><td>53.9°C</td><td>74.5°C</td></tr><tr><td>5</td><td>D1</td><td>BYC10-600 10A/600V</td><td>58.2°C</td><td>78.4°C</td></tr><tr><td>6</td><td>Q1</td><td>IRFP460A 20A/500V</td><td>58.8°C</td><td>80.1°C</td></tr><tr><td>7</td><td>Q4</td><td>IRFP460A 20A/500V</td><td>48.6°C</td><td>70.3°C</td></tr><tr><td>8</td><td>T1</td><td>TF2108</td><td>78.6°C</td><td>99.4°C</td></tr><tr><td>9</td><td>BD1</td><td>10A/800V US10KB80R</td><td>60.4°C</td><td>81.6°C</td></tr><tr><td>10</td><td>TSW1</td><td>ST-22W-R2 90°C 90mm</td><td>57.8°C</td><td>77.3°C</td></tr><tr><td>11</td><td>C18</td><td>100u/35V L7Kh 8*11.5 YXF</td><td>52.9°C</td><td>73.9°C</td></tr><tr><td>12</td><td>C61</td><td>330u/25V UL8Kh 8*11.5 ZLH</td><td>52.2°C</td><td>72.7°C</td></tr><tr><td>13</td><td>C105</td><td>4700u/10V UL10Kh ZLH</td><td>53.2°C</td><td>72.7°C</td></tr><tr><td>14</td><td>Q101</td><td>STP80NF03L-04 80A/30V</td><td>66.8°C</td><td>88.5°C</td></tr><tr><td>15</td><td>Q104</td><td>STP80NF03L-04 80A/30V</td><td>61.7°C</td><td>83.6°C</td></tr><tr><td>16</td><td>L100</td><td>TR936 CS270125E18</td><td>46.0°C</td><td>65.7°C</td></tr><tr><td>17</td><td>TSW2</td><td>ST-22W-R1 90°C 100mm</td><td>55.6°C</td><td>76.4°C</td></tr><tr><td>18</td><td>C19</td><td>47u/25V L5Kh 5*11 KY</td><td>58.0°C</td><td>79.4°C</td></tr><tr><td>19</td><td>D900</td><td>TVS ST02D-200</td><td>45.7°C</td><td>65.5°C</td></tr><tr><td>20</td><td>U900</td><td>PWM TNY275PN</td><td>42.3°C</td><td>62.2°C</td></tr><tr><td>21</td><td>T900</td><td>TF1593-R2</td><td>39.8°C</td><td>58.8°C</td></tr><tr><td>22</td><td>C955</td><td>220u/16V UL8Kh 6.3*11 ZLH</td><td>33.8°C</td><td>52.5°C</td></tr></table> |                                                                    |                           | NO      | Position | P/N | ROOM AMBIENT<br>Ta= 27.1 °C | HIGH AMBIENT<br>Ta= 50 °C | 1 | LF2 | TR548-R2 | 56.8°C | 78.9°C | 2 | U1 | PWM FAN4801NY | 51.1°C | 71.5°C | 3 | L3 | TR934 | 66.6°C | 89.2°C | 4 | C5 | 330u/400V 105°C 30*30 HU | 53.9°C | 74.5°C | 5 | D1 | BYC10-600 10A/600V | 58.2°C | 78.4°C | 6 | Q1 | IRFP460A 20A/500V | 58.8°C | 80.1°C | 7 | Q4 | IRFP460A 20A/500V | 48.6°C | 70.3°C | 8 | T1 | TF2108 | 78.6°C | 99.4°C | 9 | BD1 | 10A/800V US10KB80R | 60.4°C | 81.6°C | 10 | TSW1 | ST-22W-R2 90°C 90mm | 57.8°C | 77.3°C | 11 | C18 | 100u/35V L7Kh 8*11.5 YXF | 52.9°C | 73.9°C | 12 | C61 | 330u/25V UL8Kh 8*11.5 ZLH | 52.2°C | 72.7°C | 13 | C105 | 4700u/10V UL10Kh ZLH | 53.2°C | 72.7°C | 14 | Q101 | STP80NF03L-04 80A/30V | 66.8°C | 88.5°C | 15 | Q104 | STP80NF03L-04 80A/30V | 61.7°C | 83.6°C | 16 | L100 | TR936 CS270125E18 | 46.0°C | 65.7°C | 17 | TSW2 | ST-22W-R1 90°C 100mm | 55.6°C | 76.4°C | 18 | C19 | 47u/25V L5Kh 5*11 KY | 58.0°C | 79.4°C | 19 | D900 | TVS ST02D-200 | 45.7°C | 65.5°C | 20 | U900 | PWM TNY275PN | 42.3°C | 62.2°C | 21 | T900 | TF1593-R2 | 39.8°C | 58.8°C | 22 | C955 | 220u/16V UL8Kh 6.3*11 ZLH | 33.8°C | 52.5°C | P |
| NO | Position                                                          | P/N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ROOM AMBIENT<br>Ta= 27.1 °C                                        | HIGH AMBIENT<br>Ta= 50 °C |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 1  | LF2                                                               | TR548-R2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 56.8°C                                                             | 78.9°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 2  | U1                                                                | PWM FAN4801NY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 51.1°C                                                             | 71.5°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 3  | L3                                                                | TR934                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 66.6°C                                                             | 89.2°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 4  | C5                                                                | 330u/400V 105°C 30*30 HU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 53.9°C                                                             | 74.5°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 5  | D1                                                                | BYC10-600 10A/600V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 58.2°C                                                             | 78.4°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 6  | Q1                                                                | IRFP460A 20A/500V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 58.8°C                                                             | 80.1°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 7  | Q4                                                                | IRFP460A 20A/500V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 48.6°C                                                             | 70.3°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 8  | T1                                                                | TF2108                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 78.6°C                                                             | 99.4°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 9  | BD1                                                               | 10A/800V US10KB80R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 60.4°C                                                             | 81.6°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 10 | TSW1                                                              | ST-22W-R2 90°C 90mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 57.8°C                                                             | 77.3°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 11 | C18                                                               | 100u/35V L7Kh 8*11.5 YXF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 52.9°C                                                             | 73.9°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 12 | C61                                                               | 330u/25V UL8Kh 8*11.5 ZLH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 52.2°C                                                             | 72.7°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 13 | C105                                                              | 4700u/10V UL10Kh ZLH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 53.2°C                                                             | 72.7°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 14 | Q101                                                              | STP80NF03L-04 80A/30V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 66.8°C                                                             | 88.5°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 15 | Q104                                                              | STP80NF03L-04 80A/30V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 61.7°C                                                             | 83.6°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 16 | L100                                                              | TR936 CS270125E18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 46.0°C                                                             | 65.7°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 17 | TSW2                                                              | ST-22W-R1 90°C 100mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 55.6°C                                                             | 76.4°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 18 | C19                                                               | 47u/25V L5Kh 5*11 KY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 58.0°C                                                             | 79.4°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 19 | D900                                                              | TVS ST02D-200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 45.7°C                                                             | 65.5°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 20 | U900                                                              | PWM TNY275PN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 42.3°C                                                             | 62.2°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 21 | T900                                                              | TF1593-R2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 39.8°C                                                             | 58.8°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 22 | C955                                                              | 220u/16V UL8Kh 6.3*11 ZLH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 33.8°C                                                             | 52.5°C                    |         |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 2  | OVER LOAD BURN-IN TEST                                            | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | I/P : 230 VAC<br>O/P : 123 % LOAD<br>Ta : 25°C                     | TEST : OK                 | P       |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | I/P : 264VAC/100VAC<br>O/P : 100 % LOAD<br>Ta= -40 °C              | TEST : OK                 | P       |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 50 °C<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | I/P : 272 VAC<br>O/P : FULL LOAD<br>Ta= 50 °C<br>HUMIDITY= 95 %R.H | TEST : OK                 | P       |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03 % (0~50°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | I/P : 230 VAC<br>O/P : FULL LOAD                                   | ± 0.001 % (0~50°C)        | P       |          |     |                             |                           |   |     |          |        |        |   |    |               |        |        |   |    |       |        |        |   |    |                          |        |        |   |    |                    |        |        |   |    |                   |        |        |   |    |                   |        |        |   |    |        |        |        |   |     |                    |        |        |    |      |                     |        |        |    |     |                          |        |        |    |     |                           |        |        |    |      |                      |        |        |    |      |                       |        |        |    |      |                       |        |        |    |      |                   |        |        |    |      |                      |        |        |    |     |                      |        |        |    |      |               |        |        |    |      |              |        |        |    |      |           |        |        |    |      |                           |        |        |   |

|    |                          |                                                                                                                                                                                                                                                                               |                                                     |   |
|----|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---|
| 6  | STORAGE TEMPERATURE TEST | 1. Thermal shock Temperature : -45℃~ +90℃<br>2. Temperature change rate : 25℃ / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 5 CYCLE<br>5. Input/Output condition : STATIC                                                            | OK                                                  | P |
| 7  | THERMAL SHOCK TEST       | 1. Thermal shock Temperature : -40℃~ +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 : 230VAC/Full Load AC ON/OFF TEST<br>turn on 58sec ; turn off 2sec | OK                                                  | P |
| 8  | 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 : 5G<br>(5) Test Time : 60min in each axis (X.Y.Z)<br>(6) Ta : 25℃                                                                         | TEST : OK                                           | P |
| 9  | CAPACITOR LIFE CYCLE     | MSP-450-5:SUPPOSE C105 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25 ℃ LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= 50 ℃ LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta= 50 ℃ LIFE TIME                                                     | (1) 487645.9HRS<br>(2) 109089.4HRS<br>(3) 229111HRS | P |
| 10 | MTBF                     | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE : 130.5K HRS                                                                                                                                                                                                         |                                                     | P |

| SAMPLE         | TEST RESULT | TESTER     | APPROVAL      |
|----------------|-------------|------------|---------------|
| RD SAMPLE      | PASS        | SANFORD SU | VINCENT TSENG |
| PRODUCT SAMPLE | PASS        | SANFORD SU | VINCENT TSENG |

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