



# Test Report: XDR-480-48

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480W AC/DC High-End Ultra Slim Industrial DIN Rail  
Power

## ■ 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

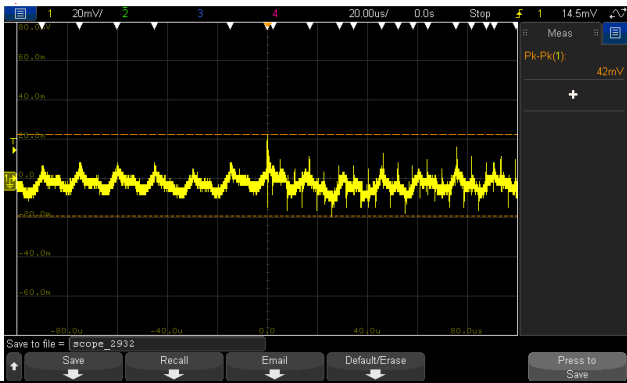
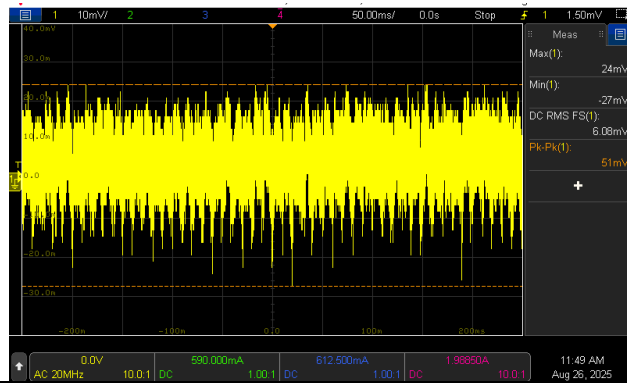
E.M.C. Test

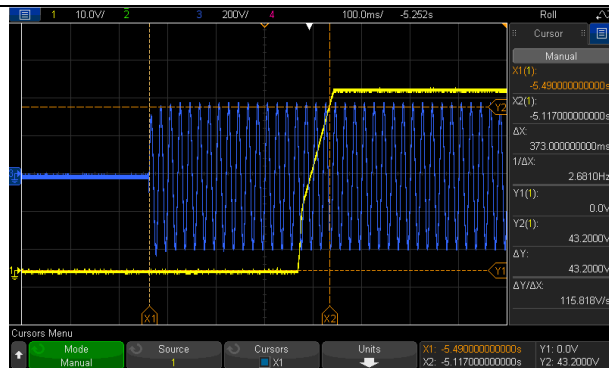
## ■ RELIABILITY TEST

ENVIRONMENT TEST

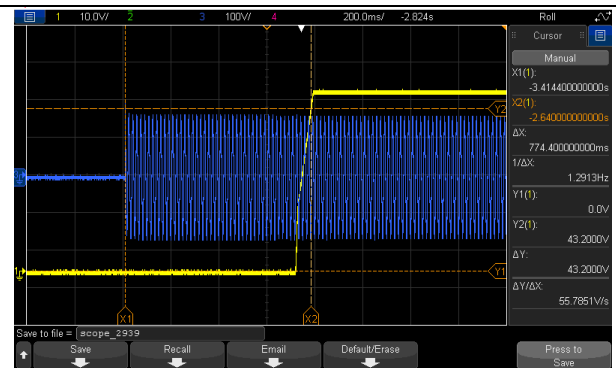
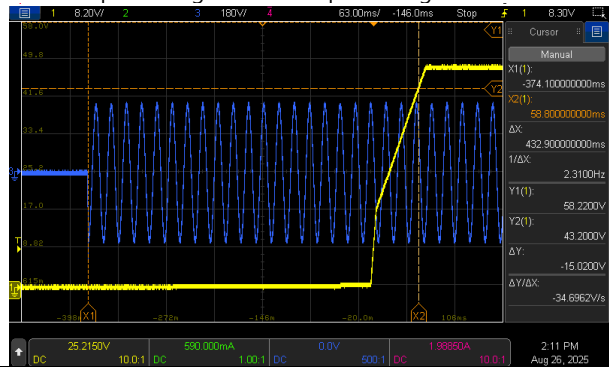
## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

| NO                                                                                                                                                                                                                                                        | TEST ITEM                      | SPECIFICATION                  | TEST CONDITION                                                                 | RESULT                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1                                                                                                                                                                                                                                                         | OUTPUT VOLTAGE<br>ADJUST RANGE | CH1: 48V~55V                   | I/P : 277 VAC<br>I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C | 46.484V~57.46V/277VAC<br>46.485V~57.46V/230VAC<br>46.486V~57.46V/115VAC |
| 2                                                                                                                                                                                                                                                         | OUTPUT VOLTAGE<br>TOLERANCE    | V1: -1% ~ +1%                  | I/P: 85VAC~305VAC<br>O/P:FULL~MIN. LOAD<br>Ta:25°C                             | V1: -0.025% ~ 0.025%                                                    |
| 3                                                                                                                                                                                                                                                         | LINE REGULATION                | V1: -0.5% ~ +0.5%              | I/P: 85VAC~ 305VAC<br>O/P:FULL LOAD<br>Ta:25°C                                 | V1: -0.025% ~ 0.025%                                                    |
| 4                                                                                                                                                                                                                                                         | LOAD REGULATION                | V1: -1% ~ +1%                  | I/P: 230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C                                   | V1: -0.007% ~ 0%                                                        |
| 5                                                                                                                                                                                                                                                         | OVER/UNDERSHOOT TEST           | <±5%                           | I/P: 230VAC<br>O/P:FULL LOAD / NO LOAD/ PEAK<br>LOAD<br>Ta:25°C                | 0.4%                                                                    |
| 6                                                                                                                                                                                                                                                         | RIPPLE & NOISE (Max )          | V1: 120mVp-p                   | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C                                         | 42mVp-p / high frequency<br>51mVp-p / low frequency                     |
| <div> <div>high frequency :</div>  </div> <div> <div>low frequency :</div>  </div> |                                |                                |                                                                                |                                                                         |
| 7                                                                                                                                                                                                                                                         | SET UP TIME(Max)               | 230VAC/1500ms<br>115VAC/3000ms | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                 | 277VAC/ 373 ms<br>230VAC/ 432.9ms<br>115VAC/ 774.4ms                    |
| INPUT=277VAC/50HZ @ FULL LOAD<br>CH1: Output Voltage CH3: AC Input Voltage                                                                                                                                                                                |                                |                                | INPUT=115VAC/60HZ @ FULL LOAD<br>CH1: Output Voltage CH3: AC Input Voltage     |                                                                         |



INPUT=230VAC/50HZ @ FULL LOAD  
CH1: Output Voltage CH3: AC Input Voltage



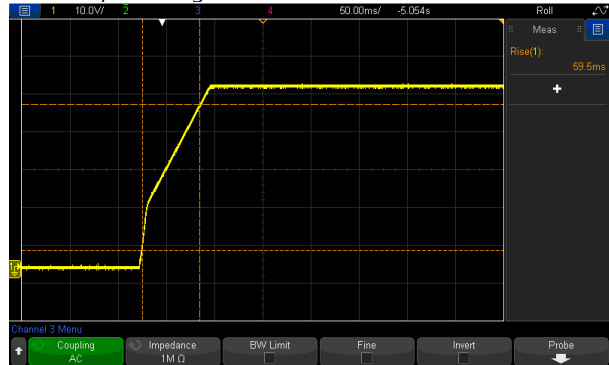
8 RISE TIME (Max)

230VAC/150ms  
115VAC/150ms

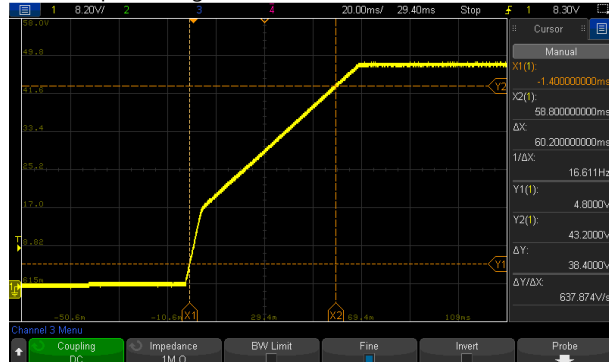
I/P : 230 VAC  
I/P : 115 VAC  
O/P : FULL LOAD  
Ta : 25°C

277VAC/ 59.5ms  
230VAC/ 60.2ms  
115VAC/ 60.4ms

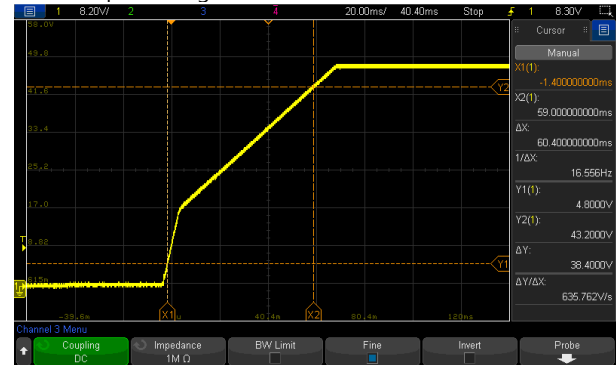
INPUT=277VAC/50HZ @ FULL LOAD  
CH1: Output Voltage



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

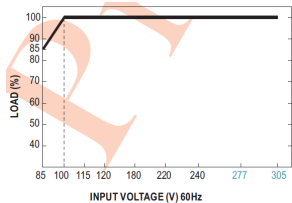


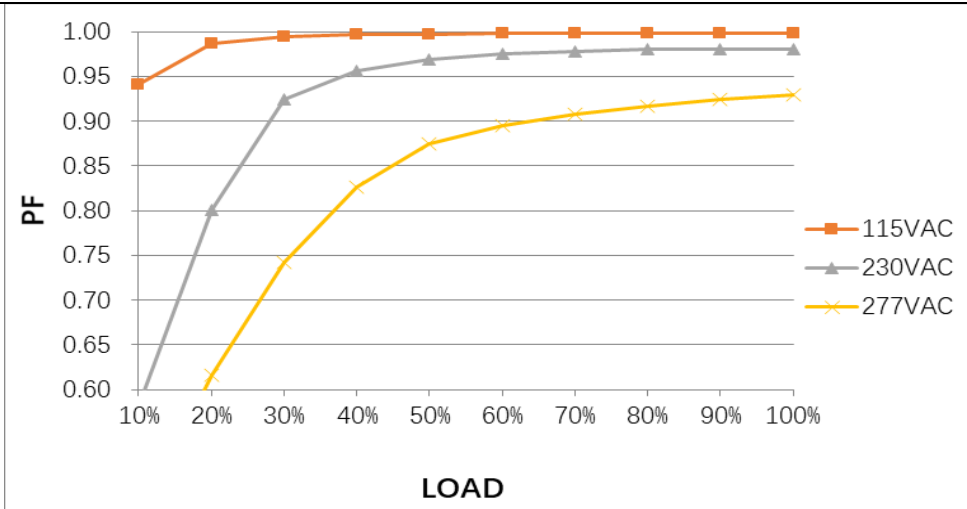
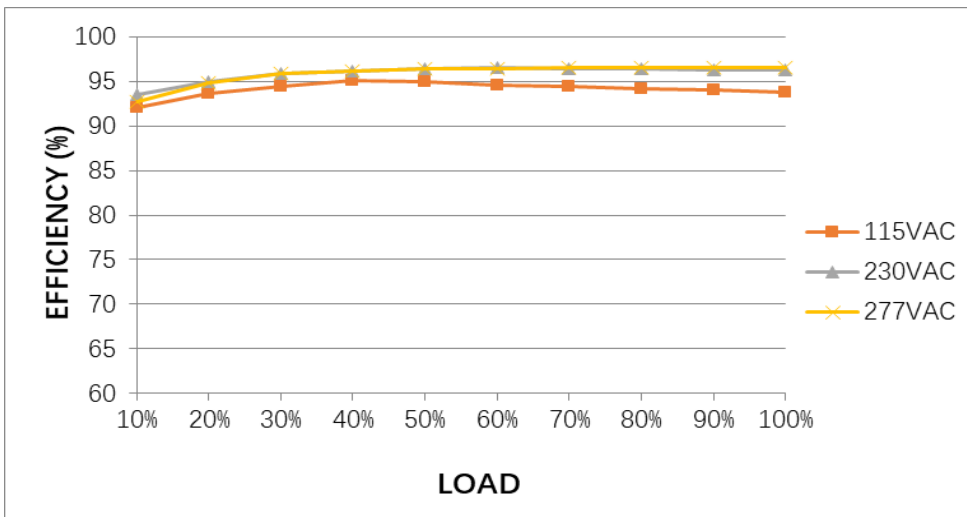
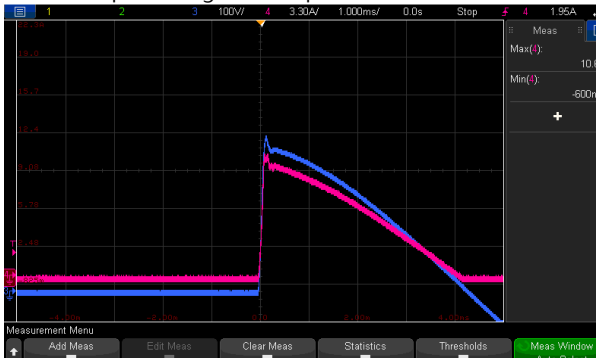
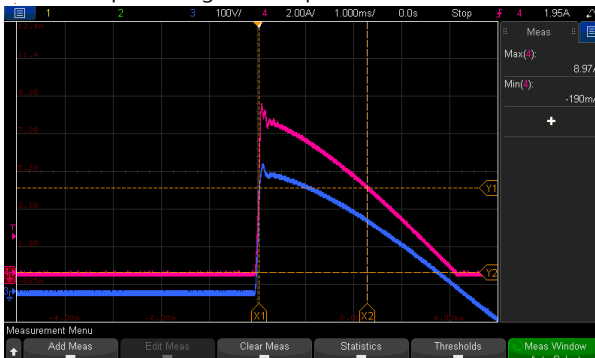
INPUT=115VAC/60HZ @ FULL LOAD  
CH1: Output Voltage

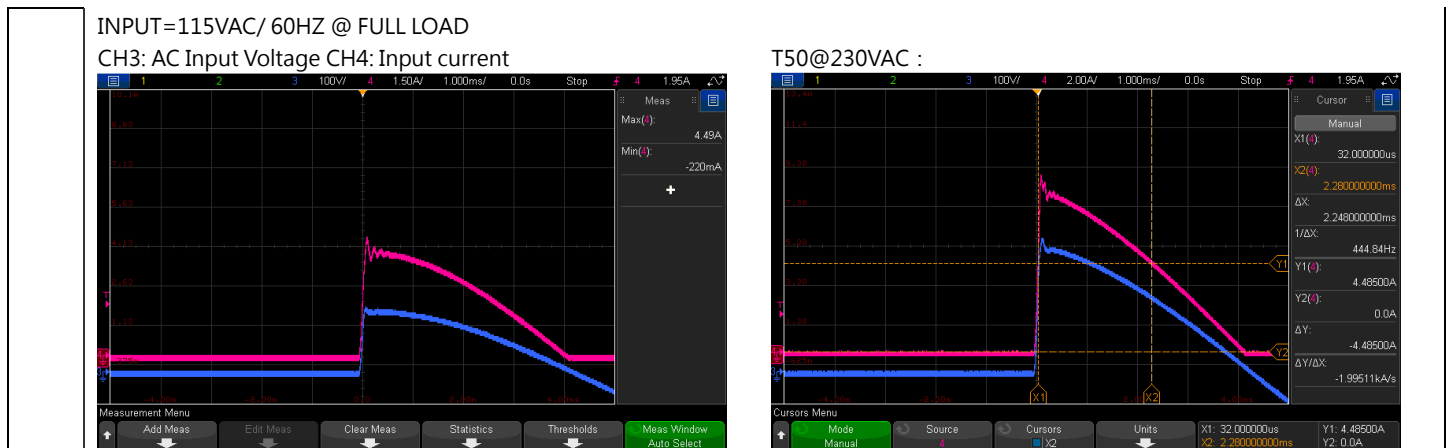


|                                                                                                                                                                                                                                                                                                                       |                         |                              |                                                                                                           |                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 9                                                                                                                                                                                                                                                                                                                     | HOLD UP TIME (Typ.)     | 230VAC/ 15ms<br>115VAC/ 15ms | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                            | 277VAC/ 32.8ms<br>230VAC/ 31.2ms<br>115VAC/ 29.6ms |
| <div> <div> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH3: AC Input Voltage</p> </div> <div> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH3: AC Input Voltage</p> </div> <div> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH3: AC Input Voltage</p> </div> </div> |                         |                              |                                                                                                           |                                                    |
| 10                                                                                                                                                                                                                                                                                                                    | DYNAMIC LOAD            | V1: 4800mVp-p                | I/P: 230VAC<br>O/P:<br>(1) FULL/ MIN LOAD 50%DUTY / 120HZ<br>(2) FULL/ MIN LOAD 50%DUTY / 1KHZ<br>Ta:25°C | 1010mVp-p<br>753mVp-p                              |
| <div> <div> <p>FULL / MIN LOAD 50%DUTY / 120HZ</p> </div> <div> <p>FULL / MIN LOAD 50%DUTY / 1KHZ</p> </div> </div>                                                                                                                                                                                                   |                         |                              |                                                                                                           |                                                    |
| 11                                                                                                                                                                                                                                                                                                                    | TRANSIENT RECOVERY TIME | V1: 4800mVp-p<br><500us      | I/P: 230VAC<br>O/P:40% LOAD CHANGE<br>50%DUTY/120HZ 1.25A/us                                              | 383mVp-p                                           |

## INPUT FUNCTION TEST

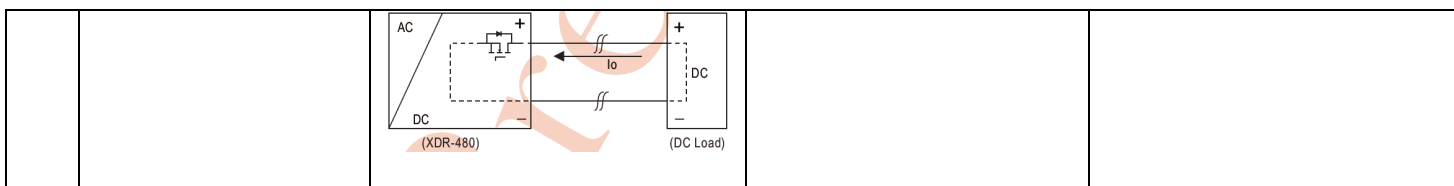
| NO     | TEST ITEM             | SPECIFICATION                                                                                                      | TEST CONDITION                                                                                                                                                            | RESULT                                                                                                                                                                                                                                                     |  |                  |                 |        |        |        |        |        |        |        |        |        |
|--------|-----------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1      | INPUT VOLTAGE RANGE   | 85VAC~305VAC<br>80VDC~ 431VDC<br> | (1) I/P: TESTING<br>O/P: FULL / 85% LOAD<br>(2) I/P: DC TESTING (L: + N: -)<br>O/P: FULL / 85% LOAD<br>(3) I/P: DC TESTING (L: - N: +)<br>O/P: FULL / 85% LOAD<br>Ta:25°C | (1) 78.2V~305V/ FULL LOAD<br>78.0V~305V/ 85% LOAD<br>(2) 75.2Vdc~431Vdc/FULL LOAD<br>75.0Vdc~431Vdc/85% LOAD<br>(3) 74.8Vdc~431Vdc/FULL LOAD<br>74.6Vdc~431Vdc/85% LOAD                                                                                    |  |                  |                 |        |        |        |        |        |        |        |        |        |
|        |                       |                                                                                                                    | I/P:<br>HIGH-LINE+10V=315V<br>O/P:FULL/MIN LOAD<br>(PLEASE CHECK DERATING CURVE)<br>ON: 30 Sec OFF: 30 Sec 10MIN<br>( POWER ON/OFF NO DAMAGE )                            | TEST : OK                                                                                                                                                                                                                                                  |  |                  |                 |        |        |        |        |        |        |        |        |        |
|        |                       | Derating 50% Load @80VDC                                                                                           | I/P: 80VDC<br>O/P: 50% Load                                                                                                                                               | TEST : OK                                                                                                                                                                                                                                                  |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 2      | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE                                                                                           | I/P: 85VAC~ 305VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C                                                                                                                        | TEST : OK                                                                                                                                                                                                                                                  |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 3      | INPUT CURRENT (Typ.)  | 277V/ 2.5A<br>230V/ 3A<br>115V/ 6A                                                                                 | I/P : 230 VAC<br>I/P : 115 VAC<br>I/P : 277VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                            | I =1.9489A/ 277VAC<br>I =2.2211A/ 230VAC<br>I =4.5136A/ 115VAC                                                                                                                                                                                             |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 4      | LEAKAGE CURRENT       | < 1mA@240Vac<br>< 1.5mA@277Vac                                                                                     | I/P : 240VAC/60HZ<br>I/P : 277VAC/60HZ<br>O/P : Min LOAD<br>Ta : 25°C                                                                                                     | 0.459mA@240Vac<br>0.529mA@277Vac                                                                                                                                                                                                                           |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 5      | NO LOAD CONSUMPTION   | Remote Power OFF:<br>1W@115Vac & 230Vac & 277Vac<br>Remote Power ON:<br>3W@115Vac & 230Vac & 277Vac                | I/P : 115VAC<br>I/P : 230VAC<br>I/P : 277VAC<br>O/P : NO LOAD<br>Ta : 25°C                                                                                                | TEST: <table><tr><td></td><td>Remote Power OFF</td><td>Remote Power ON</td></tr><tr><td>115VAC</td><td>0.622W</td><td>2.402W</td></tr><tr><td>230VAC</td><td>0.731W</td><td>2.409W</td></tr><tr><td>277VAC</td><td>0.808W</td><td>2.405W</td></tr></table> |  | Remote Power OFF | Remote Power ON | 115VAC | 0.622W | 2.402W | 230VAC | 0.731W | 2.409W | 277VAC | 0.808W | 2.405W |
|        | Remote Power OFF      | Remote Power ON                                                                                                    |                                                                                                                                                                           |                                                                                                                                                                                                                                                            |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 115VAC | 0.622W                | 2.402W                                                                                                             |                                                                                                                                                                           |                                                                                                                                                                                                                                                            |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 230VAC | 0.731W                | 2.409W                                                                                                             |                                                                                                                                                                           |                                                                                                                                                                                                                                                            |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 277VAC | 0.808W                | 2.405W                                                                                                             |                                                                                                                                                                           |                                                                                                                                                                                                                                                            |  |                  |                 |        |        |        |        |        |        |        |        |        |
| 6      | POWER FACTOR (Typ.)   | 0.90/ 277VAC<br>0.95/ 230VAC<br>0.98/115VAC                                                                        | I/P : 277 VAC<br>I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                           | PF=0.9253/277VAC<br>PF=0.9797/230VAC<br>PF=0.9978/115VAC                                                                                                                                                                                                   |  |                  |                 |        |        |        |        |        |        |        |        |        |
|        | P.F vs LOAD           |                                                                                                                    |                                                                                                                                                                           |                                                                                                                                                                                                                                                            |  |                  |                 |        |        |        |        |        |        |        |        |        |

|   |                                                                                      |                                               |                                                                                 |                                                                            |
|---|--------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------|
|   |    |                                               |                                                                                 |                                                                            |
| 7 | EFFICIENCY(Typ.)                                                                     | 96%                                           | I/P:230 VAC<br>O/P:FULL LOAD<br>Ta:25°C                                         | 96.02%                                                                     |
|   | EFFICIENCY vs LOAD                                                                   |                                               |                                                                                 |                                                                            |
|   |   |                                               |                                                                                 |                                                                            |
| 8 | INRUSH CURRENT(Typ.)                                                                 | 277V/15A<br>230V/10A<br>115V/6A<br>COLD START | I/P : 277 VAC<br>I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | I =10.6/ 277VAC<br>I =8.97A/ 230VAC<br>I =4.49A/ 115VAC<br>T50=2248us/230V |
|   | INPUT=277VAC/50HZ @ FULL LOAD<br>CH3: AC Input Voltage CH4: Input current            |                                               |                                                                                 |                                                                            |
|   |   |                                               |                                                                                 |                                                                            |
|   | INPUT=230VAC/50HZ @ FULL LOAD<br>CH3: AC Input Voltage CH4: Input current            |                                               |                                                                                 |                                                                            |
|   |  |                                               |                                                                                 |                                                                            |

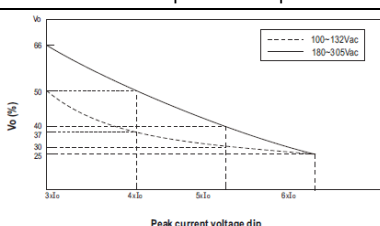
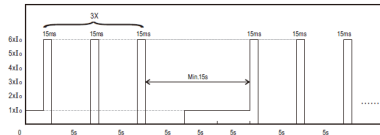


## PROTECTION FUNCTION TEST

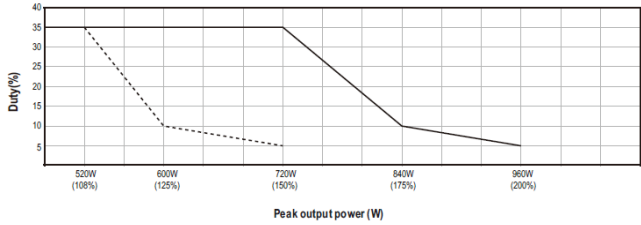
| NO | TEST ITEM                                         | SPECIFICATION                                                                                                                                                                                                                    | TEST CONDITION                                                       | RESULT                                                                                                                                                                                                                                                                          |
|----|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | OVER LOAD PROTECTION                              | Protection type:<br>105%~200% rated output power<br>for more than 5 sec then constant<br>current limiting at rate current<br>without shutdown when<br>$V_o=30\%\sim 100\%$ ;<br><br>Hiccup mode when $V_o<30\%$ rated<br>voltage | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 100VAC<br>O/P: TESTING<br>Ta:25°C | 125.8%/305VAC<br>125.8%/230VAC<br>126.0%/100VAC<br>Protection type:<br>105%~200% rated output power<br>for more than 5 sec then constant<br>current limiting at rate current<br>without shutdown when<br>$V_o=30\%\sim 100\%$ ;<br>Hiccup mode when $V_o<30\%$ rated<br>voltage |
| 2  | OVER VOLTAGE PROTECTION                           | 57V~66V<br>Protection type:<br>Shut down o/p voltage, re-power<br>on to recover                                                                                                                                                  | I/P: 305VAC<br>I/P: 85VAC<br>O/P: MIN LOAD<br>Ta:25°C                | 60.8V/305VAC<br>60.8V/ 85VAC<br>PROTECTION TYPE :<br>Shut down o/p voltage, re-power<br>on to recover                                                                                                                                                                           |
| 3  | OVER TEMPERATURE PROTECTION                       | Protection type:<br>Shut down o/p voltage, recovers<br>automatically after temperature<br>goes down                                                                                                                              | I/P: 305VAC<br>I/P: 85VAC<br>O/P: FULL LOAD                          | O.T.P. Active<br>Protection type :<br>Shut down o/p voltage, recovers<br>automatically after temperature<br>goes down                                                                                                                                                           |
| 4  | SHORT PROTECTION                                  | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE<br>Protection type:<br>Hiccup mode when $V_o<30\%$ rated<br>voltage , recovers automatically<br>after fault condition is removed                                                          | I/P: 305VAC<br>I/P: 85VAC<br>O/P: FULL LOAD                          | NO DAMAGE<br>PROTECTION TYPE :<br>Hiccup mode when $V_o<30\%$ rated<br>voltage , recovers automatically<br>after fault condition is removed                                                                                                                                     |
| 5  | Protection against Inverse Voltages from the Load | Prevent PSU damage from Back<br>Electro magnetic Force during<br>deceleration of motor or inductive<br>load                                                                                                                      | I/P: 230VAC<br>O/P: TESTING<br>Ta:25°C                               | TEST : <u>OK</u>                                                                                                                                                                                                                                                                |



## CONTROL FUNCTION TEST

| NO                                                                          | TEST ITEM                                                                                                 | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEST CONDITION                         | RESULT               |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------|--------------------------|-----------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------|------|-------|------|-------|------|------|------|------|------|---------------|------|-----|------|------|------|------|------|------|
| 1                                                                           | DC OK CONTACT RATINGS                                                                                     | 30VDC/1A , 30VAC/0.5A<br>RESISTIVE LOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C | TEST: <u>OK</u>      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 2                                                                           | REMOTE CONTROL                                                                                            | Power ON:<br>Pin9 and Pin10 Short or keep 4~5Vdc<br>Power OFF:<br>Pin9 and Pin10 Open or keep < 0.5Vdc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C | TEST: <u>OK</u>      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 3                                                                           | PULSE CURRENT CAPABILTY                                                                                   | <div></div> <table><thead><tr><th>Load</th><th>100~132Vac<br/>Vo (%)</th><th>180~305Vac<br/>Vo (%)</th><th>Time</th></tr></thead><tbody><tr><td>3xIo</td><td>50</td><td>66</td><td>100ms</td></tr><tr><td>4xIo</td><td>37</td><td>50</td><td>70ms</td></tr><tr><td>5xIo</td><td>30</td><td>40</td><td>40ms</td></tr><tr><td>6xIo</td><td>25</td><td>25</td><td>15ms</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Load                                   | 100~132Vac<br>Vo (%) | 180~305Vac<br>Vo (%)     | Time                                                                                                      | 3xIo  | 50                                                                                        | 66      | 100ms                                                                                   | 4xIo                                                                        | 37                                                                                                      | 50           | 70ms                                                                                                    | 5xIo             | 30                                                                                                      | 40                                     | 40ms                                                                                                    | 6xIo                             | 25                                                                                              | 25            | 15ms                                                                                                    | I/P: 180VAC<br>I/P: 100VAC<br>O/P: TESTING<br>Ta:25°C | <b>180VAC :</b> <table><thead><tr><th>Load</th><th>Iout_Time(ms)</th></tr></thead><tbody><tr><td>3xIo</td><td>113.2</td></tr><tr><td>4xIo</td><td>112.8</td></tr><tr><td>5xIo</td><td>56.4</td></tr><tr><td>6xIo</td><td>26.5</td></tr></tbody></table> <b>100VAC :</b> <table><thead><tr><th>Load</th><th>Iout_Time(ms)</th></tr></thead><tbody><tr><td>3xIo</td><td>112</td></tr><tr><td>4xIo</td><td>85.6</td></tr><tr><td>5xIo</td><td>59.4</td></tr><tr><td>6xIo</td><td>26.9</td></tr></tbody></table> | Load | Iout_Time(ms) | 3xIo | 113.2 | 4xIo | 112.8 | 5xIo | 56.4 | 6xIo | 26.5 | Load | Iout_Time(ms) | 3xIo | 112 | 4xIo | 85.6 | 5xIo | 59.4 | 6xIo | 26.9 |
| Load                                                                        | 100~132Vac<br>Vo (%)                                                                                      | 180~305Vac<br>Vo (%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Time                                   |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 3xIo                                                                        | 50                                                                                                        | 66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 100ms                                  |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 4xIo                                                                        | 37                                                                                                        | 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 70ms                                   |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 5xIo                                                                        | 30                                                                                                        | 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 40ms                                   |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 6xIo                                                                        | 25                                                                                                        | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15ms                                   |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Load                                                                        | Iout_Time(ms)                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 3xIo                                                                        | 113.2                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 4xIo                                                                        | 112.8                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 5xIo                                                                        | 56.4                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 6xIo                                                                        | 26.5                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Load                                                                        | Iout_Time(ms)                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 3xIo                                                                        | 112                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 4xIo                                                                        | 85.6                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 5xIo                                                                        | 59.4                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 6xIo                                                                        | 26.9                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 4                                                                           | PULSE CURRENT CAPABILTY                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | I/P:230VAC<br>O/P: TESTING<br>Ta:25°C  | TEST : <u>OK</u>     |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| 5                                                                           | LED Status Indictors                                                                                      | <b>LED :</b> <table><thead><tr><th>Description</th><th>Output of alarm</th></tr></thead><tbody><tr><td>Restore Factory Settings</td><td>Green : 3 Blink/Pause </td></tr><tr><td>DC OK</td><td>Green </td></tr><tr><td>DC Fail</td><td>Red </td></tr><tr><td>Overload<br/>(115%ac: ~150% rated current)<br/>(220V/ac: ~200% rated current)</td><td>Red : 1 Blink/Pause </td></tr><tr><td>Over voltage</td><td>Red : 2 Blink/Pause </td></tr><tr><td>Over temperature</td><td>Red : 3 Blink/Pause </td></tr><tr><td>Against Inverse Voltages From The Load</td><td>Red : 4 Blink/Pause </td></tr><tr><td>High Ambient Temperature Warning</td><td>Red : Blink </td></tr><tr><td>Others (Note)</td><td>Red : 5 Blink/Pause </td></tr></tbody></table> <p><small>Note: Others include protection status AC UVP, Internal Communication error and EEPROM error.</small></p> | Description                            | Output of alarm      | Restore Factory Settings | Green : 3 Blink/Pause  | DC OK | Green  | DC Fail | Red  | Overload<br>(115%ac: ~150% rated current)<br>(220V/ac: ~200% rated current) | Red : 1 Blink/Pause  | Over voltage | Red : 2 Blink/Pause  | Over temperature | Red : 3 Blink/Pause  | Against Inverse Voltages From The Load | Red : 4 Blink/Pause  | High Ambient Temperature Warning | Red : Blink  | Others (Note) | Red : 5 Blink/Pause  | I/P:230VAC<br>O/P: TESTING<br>Ta:25°C                 | TEST : <u>OK</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Description                                                                 | Output of alarm                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Restore Factory Settings                                                    | Green : 3 Blink/Pause  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| DC OK                                                                       | Green                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| DC Fail                                                                     | Red                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Overload<br>(115%ac: ~150% rated current)<br>(220V/ac: ~200% rated current) | Red : 1 Blink/Pause    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Over voltage                                                                | Red : 2 Blink/Pause    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Over temperature                                                            | Red : 3 Blink/Pause    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Against Inverse Voltages From The Load                                      | Red : 4 Blink/Pause    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| High Ambient Temperature Warning                                            | Red : Blink            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |
| Others (Note)                                                               | Red : 5 Blink/Pause    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                      |                          |                                                                                                           |       |                                                                                           |         |                                                                                         |                                                                             |                                                                                                         |              |                                                                                                         |                  |                                                                                                         |                                        |                                                                                                         |                                  |                                                                                                 |               |                                                                                                         |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |               |      |       |      |       |      |      |      |      |      |               |      |     |      |      |      |      |      |      |



|   |            |                                                                                                                                                  |                                              |                  |
|---|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------|
| 6 | PARALLEL   | Up to 1920W(3+1), please refer to<br>Function Manual for more details                                                                            | I/P: TESTING<br>O/P: TESTING LOAD<br>Ta:25°C | TEST : <u>OK</u> |
| 7 | PEAK Power | I/P: 100/200VAC<br>O/P:<br> <p>-----100VAC      ————200VAC</p> |                                              | TEST : <u>OK</u> |

## COMPONENT STRESS TEST

| NO | TEST ITEM                                                | SPECIFICATION               | TEST CONDITION                                                                                                                                                                                                                                                                                                                                                             | RESULT                                                                                                                                                                                                                       |
|----|----------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | PWM Transistor<br>(D to S) or (C to E)<br>Peak Voltage   | Q5/Q6 :<br>Rated: 45A/ 600V | AC ON/OFF<br>I/P: High-Line +3V =308V<br>VDS:<br>O/P: (1)Full Load<br>(2)Output Short<br>(3) Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(4) Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6) Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br>(8) Peak Load<br>Ta:25°C | Q5<br>VDS:<br>(1) 525V<br>(2) 545V<br>(3) 529V<br>(4) 537V<br>(5) 525V<br>(6) 525V<br>(7) 529V<br>(8) 521V<br><br>Q6<br>VDS:<br>(1) 495V<br>(2) 511V<br>(3) 495V<br>(4) 495V<br>(5) 499V<br>(6) 495V<br>(7) 495V<br>(8) 487V |
| 2  | P.F.C Transistor<br>(D to S) or (C to E)<br>Peak Voltage | Q1/Q2 :<br>Rated: 31A/ 600V | AC ON/OFF<br>I/P: High-Line +3V =308V<br>VDS:<br>O/P: (1)Full Load<br>(2)Output Short<br>(3) Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(4) Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6) Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br>(8) Peak Load<br>Ta:25°C | Q1/Q2<br>VDS:<br>(1) 475V<br>(2) 491V<br>(3) 487V<br>(4) 467V<br>(5) 471V<br>(6) 499V<br>(7) 491V<br>(8) 471V                                                                                                                |

|   |                         |                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
|---|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | P.F.C DIODE             | D1 :<br>Rated: 10A/650V                                                                                                                                     | I/P: High-Line +3V =308 V<br>AC ON/OFF<br>O/P: (1)Full Load<br>(2)Output Short<br>(3) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(4) Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>(5) Peak Load<br>Ta:25°C                                                                                                                                                                                                                         | (1) 456V<br>(2) 452V<br>(3) 448V<br>(4) 456V<br>(5) 460V                                                                                                                                                                                                                                                                                                             |
| 4 | Diode Peak Voltage      | Q100/Q103:<br>Rated: 150V/60A                                                                                                                               | AC ON/OFF<br>I/P: High-Line +3V =308 V<br><u>VO=Vomax</u><br>O/P: (1)Full Load<br>(2)Output Short<br>(3) Dynamic Load Full Load/<br>Min. Load 90%Duty/1KHz<br>(4) Dynamic Load Full Load/<br>Min. Load 90%Duty/3KHz<br>(5) Dynamic Load Full Load/<br>Min. Load 90%Duty/5KHz<br>(6) Dynamic Load 100% Load/<br>Min. Load 50%Duty/120Hz<br>(7)0%→400% Load.<br>(8).NO LOAD<br>(9) Peak Load<br><br><u>VO=Vonormal</u><br>O/P: (1) Full Load<br>Ta:25°C | Q100: <u>VO=Vomax</u><br>VDS:<br>(1) 127V<br>(2) 125V<br>(3) 128V<br>(4) 131V<br>(5) 129V<br>(6) 128V<br>(7) 123V<br>(8) 126V<br>(9) 128V<br><br><u>VO=Vonormal</u><br>(1) 113.8V<br>Q103: <u>VO=Vomax</u><br>VDS:<br>(1) 126V<br>(2) 126V<br>(3) 130V<br>(4) 130V<br>(5) 129V<br>(6) 129V<br>(7) 127V<br>(8) 124V<br>(9) 132V<br><br><u>VO=Vonormal</u><br>(1) 115V |
| 5 | Input Capacitor Voltage | C5 :<br>Rated: 150μ /450V                                                                                                                                   | I/P: High-Line +3V =308V<br>O/P: (1)Full Load input on/off<br>(2) Min load input on /Off<br>(3) Full Load /Min load Change<br>(4) Full load continue<br>(5) Peak Load on/off<br>(6) Peak Load continue<br>Ta:25°C                                                                                                                                                                                                                                     | (1) 438V<br>(2) 434V<br>(3) 438V<br>(4) 438V<br>(5) 438V<br>(6) 443V                                                                                                                                                                                                                                                                                                 |
| 6 | Control IC Voltage Test | PFC/PWM IC U1 :<br>Rated : 12.5V~ 27.9V<br><br>O/P IC U101:<br>Rated: 4.75V~38V<br><br>IC U404 :<br>Rated : 3V~36V<br><br>AUX IC U2 :<br>Rated : 5.65V~6.8V | AC ON/OFF<br>I/P: High-Line +3V =308V<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) O.L.P<br>(4) O.V.P.<br>(5) No Load VR min (Low Line)<br>Ta:25°C                                                                                                                                                                                                                                                                                                | U1<br>(1) 13.8V<br>(2) 13.9V<br>(3) 13.7V<br>(4) 13.6V<br>(5) 13.6V<br><br>U101<br>(1) 15.4V<br>(2) 15.9V<br>(3) 15.5V<br>U2<br>(1) 6.46V<br>(2) 6.48V<br>(3) 6.48V<br>(4) 6.54 V<br>(5) 6.40V<br><br>U9<br>(1) 3.307V<br>(2) 3.307V<br>(3) 3.307V                                                                                                                   |

|  |  |                                                             |  |                                                                       |                                                                            |
|--|--|-------------------------------------------------------------|--|-----------------------------------------------------------------------|----------------------------------------------------------------------------|
|  |  | MCU IC U9 :<br>Rated : 2V~3.6V<br>Level: 3.2835~3.3165V     |  | (4) 14.4V<br>(5) 15.3V                                                | (4) 3.307V<br>(5) 3.307V                                                   |
|  |  | MCU IC U306:<br>Rated : 2.4V~ 3.6V<br>Level: 3.2835~3.3165V |  | U404<br>(1) 5.97V<br>(2) 5.61V<br>(3) 5.61V<br>(4) 5.53V<br>(5) 5.61V | U306<br>(1) 3.303V<br>(2) 3.303V<br>(3) 3.303V<br>(4) 3.303V<br>(5) 3.303V |

## ■ SAFETY& E.M.C. TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                                                | TEST CONDITION                                                                                              | RESULT                                                                                  |
|----|----------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 4 KVAC/min<br>I/P-FG : 2 KVAC/min<br>O/P-FG:1.5 KVAC/min<br>O/P-DC OK: 0.5 KVAC/min | I/P-O/P: 4.4 KVAC/min<br>I/P-FG: 2.4 KVAC/min<br>O/P-FG: 1.8 KVAC/min<br>O/P-DC OK: 0.6 KVAC/min<br>Ta:25°C | I/P-O/P: 2.99 mA<br>I/P-FG: 2.37mA<br>O/P-FG: 3.22mA<br>O/P-DC OK: 0.007mA<br>NO DAMAGE |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ<br>I/P-FG: 500VDC>100MΩ<br>O/P-FG:500VDC>100MΩ                          | I/P-O/P: 600 VDC<br>I/P-FG: 600 VDC<br>O/P-FG: 600 VDC<br>Ta:25°C                                           | I/P-O/P: 50GΩ<br>I/P-FG: 50GΩ<br>O/P-FG: 50GΩ<br>NO DAMAGE                              |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100mΩ                                                        | 40A /2min<br>Ta:25°C                                                                                        | 14 mΩ                                                                                   |

### E.M.C TEST

| NO | TEST ITEM  | SPECIFICATION                                                     | TEST CONDITION                                           | RESULT                        |
|----|------------|-------------------------------------------------------------------|----------------------------------------------------------|-------------------------------|
| 1  | HARMONIC   | BS EN/EN61000-3-2<br>CLASS A                                      | I/P:230VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C              | PASS                          |
| 2  | CONDUCTION | BS EN/EN55032 (CISPR32)<br>BS EN/EN61204-3<br>CNS15936<br>CLASS B | I/P : 230 VAC (50HZ)<br>O/P : FULL/50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab |
| 3  | RADIATION  | BS EN/EN55032 (CISPR32)<br>BS EN/EN61204-3<br>CNS15936<br>CLASS B | I/P : 230 VAC (50HZ)<br>O/P : FULL LOAD<br>Ta : 25°C     | PASS<br>Test by certified Lab |
| 4  | E.S.D      | BS EN/EN 61000-4-2<br>AIR : 15KV / Contact : 8KV                  | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    |

|   |                                                                                                                                   |                                                 |                                                    |            |
|---|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|------------|
| 5 | E.F.T                                                                                                                             | BS EN/EN 61000-4-4<br>INPUT : 4KV               | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C | CRITERIA A |
| 6 | SURGE                                                                                                                             | BS E /EN 61000-4-5<br>L-N : 2KV<br>L,N-PE : 4KV | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C | CRITERIA A |
| 7 | Test by certified Lab & Test Report Prepare<br>Any contradictions of the test results, please refer to the latest EMC test report |                                                 |                                                    |            |

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM             | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | TEST CONDITION         | RESULT |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
|----|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------|----|----------|------------------------|------------------------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|------|--------|--------|---|----|--------|--------|---|----|--------|--------|----|----|--------|--------|----|------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|----|--------|--------|----|------|--------|--------|----|----|--------|--------|----|----|--------|--------|----|--------|--------|---------|----|--------|--------|---------|----|-----|--------|--------|----|----|--------|--------|----|-----|--------|--------|
| 1  | TEMPERATURE RISE TEST | MODEL : XDR-480-48<br>1. ROOM AMBIENT BURN-IN : 2HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=23.3°C<br>2. HIGH AMBIENT BURN-IN : 2HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=60.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
|    |                       | <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=23.3°C</th><th>HIGH AMBIENT Ta=60.1°C</th></tr><tr><td>1</td><td>Q2</td><td>56.1°C</td><td>90.6°C</td></tr><tr><td>2</td><td>Q1</td><td>52.0°C</td><td>89.0°C</td></tr><tr><td>3</td><td>D1</td><td>56.3°C</td><td>93.3°C</td></tr><tr><td>4</td><td>R6</td><td>52.8°C</td><td>91.6°C</td></tr><tr><td>5</td><td>Q5</td><td>53.5°C</td><td>93.0°C</td></tr><tr><td>6</td><td>L2</td><td>47.0°C</td><td>85.5°C</td></tr><tr><td>7</td><td>RTH3</td><td>52.2°C</td><td>89.8°C</td></tr><tr><td>8</td><td>L1</td><td>51.9°C</td><td>89.4°C</td></tr><tr><td>9</td><td>C5</td><td>49.0°C</td><td>85.7°C</td></tr><tr><td>10</td><td>T2</td><td>47.5°C</td><td>86.5°C</td></tr><tr><td>11</td><td>Q103</td><td>55.1°C</td><td>94.1°C</td></tr><tr><td>12</td><td>Q100</td><td>53.1°C</td><td>91.9°C</td></tr><tr><td>13</td><td>RTH5</td><td>51.5°C</td><td>89.1°C</td></tr><tr><td>14</td><td>U2</td><td>50.1°C</td><td>88.2°C</td></tr><tr><td>15</td><td>U101</td><td>52.4°C</td><td>91.0°C</td></tr><tr><td>16</td><td>U1</td><td>57.0°C</td><td>96.2°C</td></tr><tr><td>17</td><td>U8</td><td>55.6°C</td><td>93.5°C</td></tr><tr><td>18</td><td>T1coil</td><td>74.8°C</td><td>114.0°C</td></tr><tr><td>19</td><td>T1core</td><td>50.0°C</td><td>102.3°C</td></tr><tr><td>20</td><td>LF2</td><td>50.0°C</td><td>87.6°C</td></tr><tr><td>21</td><td>U9</td><td>49.1°C</td><td>87.1°C</td></tr><tr><td>22</td><td>BD1</td><td>54.2°C</td><td>91.1°C</td></tr></table> |                        |        | NO | Position | ROOM AMBIENT Ta=23.3°C | HIGH AMBIENT Ta=60.1°C | 1 | Q2 | 56.1°C | 90.6°C | 2 | Q1 | 52.0°C | 89.0°C | 3 | D1 | 56.3°C | 93.3°C | 4 | R6 | 52.8°C | 91.6°C | 5 | Q5 | 53.5°C | 93.0°C | 6 | L2 | 47.0°C | 85.5°C | 7 | RTH3 | 52.2°C | 89.8°C | 8 | L1 | 51.9°C | 89.4°C | 9 | C5 | 49.0°C | 85.7°C | 10 | T2 | 47.5°C | 86.5°C | 11 | Q103 | 55.1°C | 94.1°C | 12 | Q100 | 53.1°C | 91.9°C | 13 | RTH5 | 51.5°C | 89.1°C | 14 | U2 | 50.1°C | 88.2°C | 15 | U101 | 52.4°C | 91.0°C | 16 | U1 | 57.0°C | 96.2°C | 17 | U8 | 55.6°C | 93.5°C | 18 | T1coil | 74.8°C | 114.0°C | 19 | T1core | 50.0°C | 102.3°C | 20 | LF2 | 50.0°C | 87.6°C | 21 | U9 | 49.1°C | 87.1°C | 22 | BD1 | 54.2°C | 91.1°C |
| NO | Position              | ROOM AMBIENT Ta=23.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | HIGH AMBIENT Ta=60.1°C |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 1  | Q2                    | 56.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 90.6°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 2  | Q1                    | 52.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 89.0°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 3  | D1                    | 56.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 93.3°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 4  | R6                    | 52.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 91.6°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 5  | Q5                    | 53.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 93.0°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 6  | L2                    | 47.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 85.5°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 7  | RTH3                  | 52.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 89.8°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 8  | L1                    | 51.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 89.4°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 9  | C5                    | 49.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 85.7°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 10 | T2                    | 47.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 86.5°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 11 | Q103                  | 55.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 94.1°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 12 | Q100                  | 53.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 91.9°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 13 | RTH5                  | 51.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 89.1°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 14 | U2                    | 50.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 88.2°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 15 | U101                  | 52.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 91.0°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 16 | U1                    | 57.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 96.2°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 17 | U8                    | 55.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 93.5°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 18 | T1coil                | 74.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 114.0°C                |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 19 | T1core                | 50.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 102.3°C                |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 20 | LF2                   | 50.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 87.6°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 21 | U9                    | 49.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 87.1°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |
| 22 | BD1                   | 54.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 91.1°C                 |        |    |          |                        |                        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |   |    |        |        |   |    |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |    |        |        |    |    |        |        |    |        |        |         |    |        |        |         |    |     |        |        |    |    |        |        |    |     |        |        |

|    |                                                                   | <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=23.3°C</th><th>HIGH AMBIENT Ta=60.1°C</th></tr><tr><td>23</td><td>LF100</td><td>48.9°C</td><td>89.4°C</td></tr><tr><td>24</td><td>C108</td><td>49.8°C</td><td>89.1°C</td></tr><tr><td>25</td><td>C105</td><td>49.8°C</td><td>88.3°C</td></tr><tr><td>26</td><td>C107</td><td>50.7°C</td><td>89.0°C</td></tr><tr><td>27</td><td>RG6</td><td>53.1°C</td><td>92.6°C</td></tr><tr><td>28</td><td>C109</td><td>47.2°C</td><td>87.6°C</td></tr><tr><td>29</td><td>J100</td><td>52.4°C</td><td>90.1°C</td></tr><tr><td>30</td><td>U4</td><td>49.9°C</td><td>87.5°C</td></tr></table> |                                                                                                                                                                                                                                                                                                               |                                                                       |  | NO | Position | ROOM AMBIENT Ta=23.3°C | HIGH AMBIENT Ta=60.1°C | 23 | LF100 | 48.9°C | 89.4°C | 24 | C108 | 49.8°C | 89.1°C | 25 | C105 | 49.8°C | 88.3°C | 26 | C107 | 50.7°C | 89.0°C | 27 | RG6 | 53.1°C | 92.6°C | 28 | C109 | 47.2°C | 87.6°C | 29 | J100 | 52.4°C | 90.1°C | 30 | U4 | 49.9°C | 87.5°C |
|----|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--|----|----------|------------------------|------------------------|----|-------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|------|--------|--------|----|-----|--------|--------|----|------|--------|--------|----|------|--------|--------|----|----|--------|--------|
| NO | Position                                                          | ROOM AMBIENT Ta=23.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | HIGH AMBIENT Ta=60.1°C                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 23 | LF100                                                             | 48.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 89.4°C                                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 24 | C108                                                              | 49.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 89.1°C                                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 25 | C105                                                              | 49.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 88.3°C                                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 26 | C107                                                              | 50.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 89.0°C                                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 27 | RG6                                                               | 53.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 92.6°C                                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 28 | C109                                                              | 47.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 87.6°C                                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 29 | J100                                                              | 52.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 90.1°C                                                                                                                                                                                                                                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 30 | U4                                                                | 49.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 87.5°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                                                             |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | I/P : 305VAC/100VAC<br>O/P : 80%/100 %LOAD<br>Ta= -45°C/-35°C                                                                                                                                                                                                                                                 | TEST : OK                                                             |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 60°C/95 %R.H<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | I/P : 315VAC<br>O/P : FULL LOAD<br>Ta= 60°C<br>HUMIDITY= 95 %R.H                                                                                                                                                                                                                                              | TEST : OK                                                             |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03 %/°C(0~60°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | I/P : 230 VAC<br>O/P : FULL LOAD                                                                                                                                                                                                                                                                              | ± 0.006%/°C(0~60°C)                                                   |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 6  | STORAGE TEMPERATURE<br>TEST                                       | -40~85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1. Thermal shock Temperature : -45°C~ +90°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition : STATIC                                                                                        |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 7  | THERMAL SHOCK TEST                                                | -30~60°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1. Thermal shock Temperature : -35°C~ +65°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 16 CYCLE<br>5. Input/Output condition :<br>15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST<br>1cycle:230V/ FULL LOAD Burn In Test |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 8  | VIBRATION TEST                                                    | 10 ~ 500Hz, 2G 10min./1cycle,<br>60min. each along X, Y, Z axes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Sweep Time : 10min/sweep cycle<br>(4) Acceleration : 3G<br>(5) Test Time : 180min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                       |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 9  | CAPACITOR<br>LIFE CYCLE                                           | SUPPOSE C109 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25°C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= 60°C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta= 60°C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta= 60°C LIFE TIME                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                               | (1) 1636230 HRS<br>(2) 112685 HRS<br>(3) 178025 HRS<br>(4) 237845 HRS |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 10 | MTBF                                                              | Conducted by Parts Stress Analysis Prediction<br>1139.7K hrs min. Telcordia SR-332 (Bellcore) ; 154.5K hrs min. MIL-HDBK-217F (25°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                               |                                                                       |  |    |          |                        |                        |    |       |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |     |        |        |    |      |        |        |    |      |        |        |    |    |        |        |



|    |                          |                                                                                                |
|----|--------------------------|------------------------------------------------------------------------------------------------|
| 11 | Ongoing Reliability Test | I/P : 230VAC O/P : FULL LOAD TA=50°C<br>Demonstration Mean Time Between Failure : 50,000 hours |
|----|--------------------------|------------------------------------------------------------------------------------------------|

| TEST RESULT | TESTER | REVIEW | APPROVAL |
|-------------|--------|--------|----------|
| PASS        | Hanxr  | Liutt  | Wangzd   |

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