



# Test Report: NPF-200-12

---

200W Constant Voltage+Constant Current LED Driver

## ■ 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

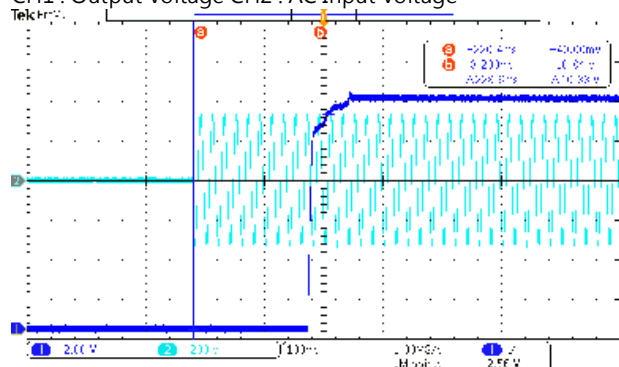
## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

| NO | TEST ITEM                                  | SPECIFICATION                  | TEST CONDITION                                                                    | RESULT                              |
|----|--------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------|-------------------------------------|
| 1  | CURRENT TOLERANCE                          | ±5%                            | I/P: 230 VAC<br>I/P:115VAC<br>O/P:FULL LOAD<br>Ta:25°C<br><b>LEDH MODE TEST</b>   | 1.4%~1.53%                          |
| 2  | CONSTANT CURRENT AND OUTPUT VOLTAGE REGION | CH1: 6V~ 12 V                  | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25°C<br><b>LEDH MODE TEST</b>                 | 5.4V~ 11.2V /230VAC                 |
| 3  | OUTPUT VOLTAGE TOLERANCE                   | V1: -4% ~ 4% (Max)             | I/P:110 /305 VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C                                  | V1: -0.66%~0.5%                     |
| 4  | LINE REGULATION                            | V1: -0.5 % ~0.5% (Max)         | I/P:110 /305 VAC<br>O/P:FULL LOAD<br>Ta:25°C                                      | V1: -0.08%~0%                       |
| 5  | LOAD REGULATION                            | V1: -2% ~ 2% (Max)             | I/P:110 /305 VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C                                 | V1: -0.5%~0.58%                     |
| 6  | OVER/UNDERSHOOT TEST                       | < <u>±</u> 5%                  | I/P:110 /305 VAC<br>O/P:FULL LOAD<br>Ta:25°C                                      | TEST: 3.08%                         |
| 7  | CURREN RIPPLE                              | V1: -5% ~ 5% (Max)             | I/P:110VAC /305AC<br>O/P:FULL/ MIN LOAD<br>Ta:25°C                                | V1: 3.72%                           |
| 8  | SET UP TIME (Max)                          | 230VAC/ 500ms<br>115VAC/ 500ms | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25°C<br><b>LEDH MODE TEST</b> | 230VAC/ 228.6ms<br>115 VAC/349.9 ms |

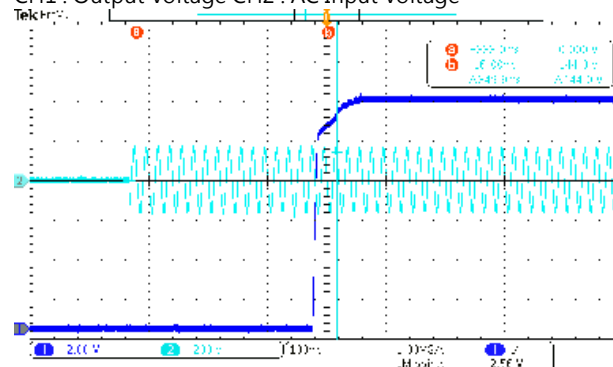
INPUT=230VAC/50HZ @ FULL LOAD

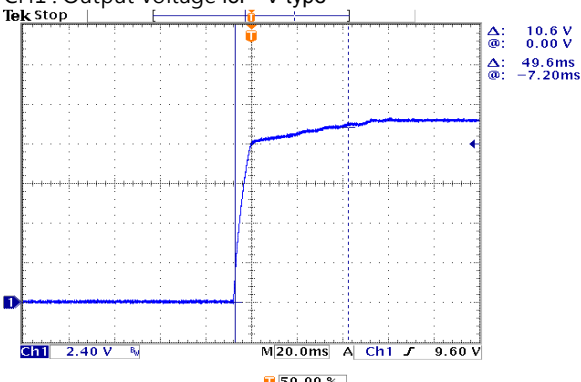
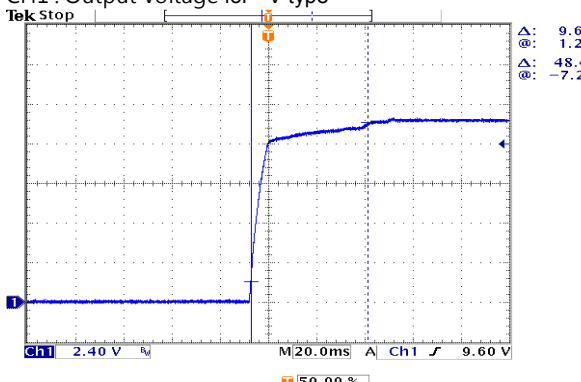
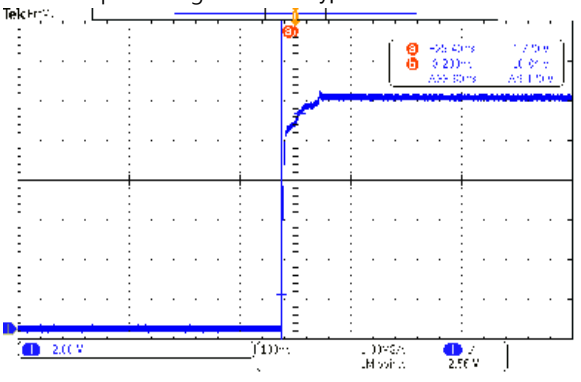
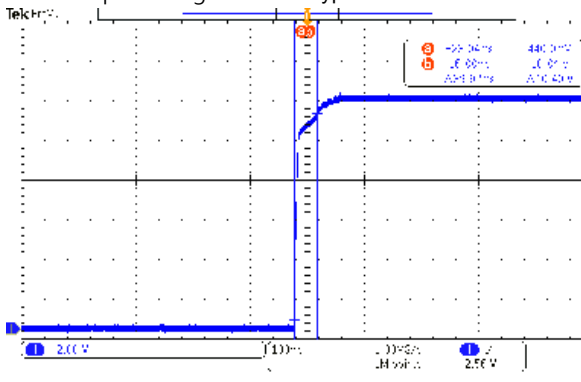
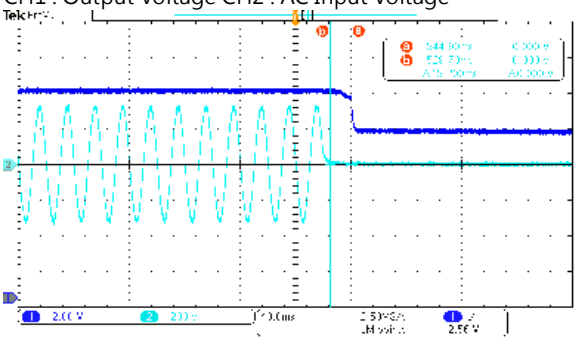
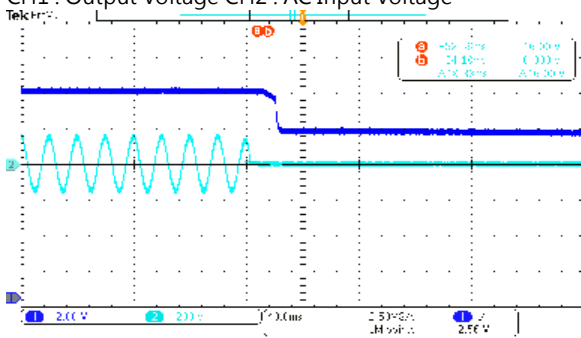
CH1 : Output Voltage CH2 : AC Input Voltage

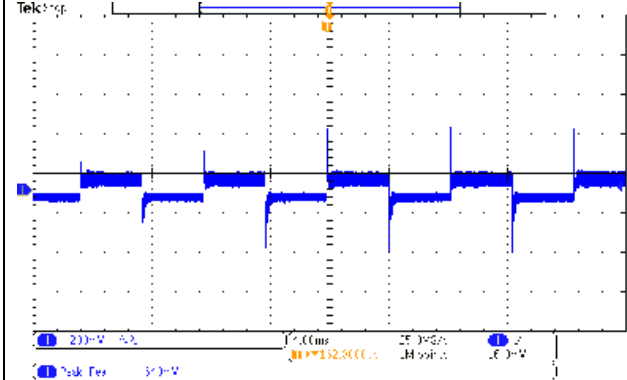
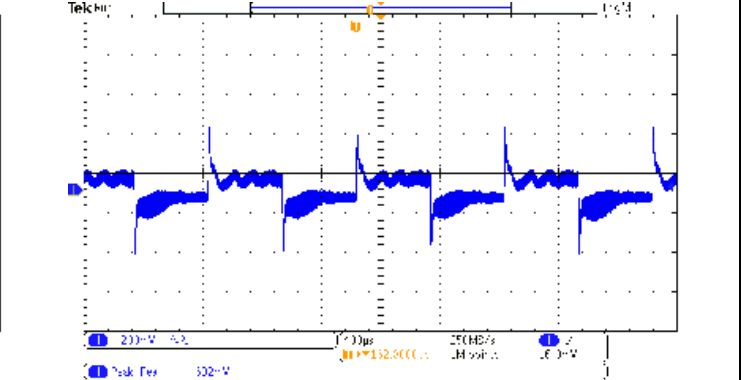
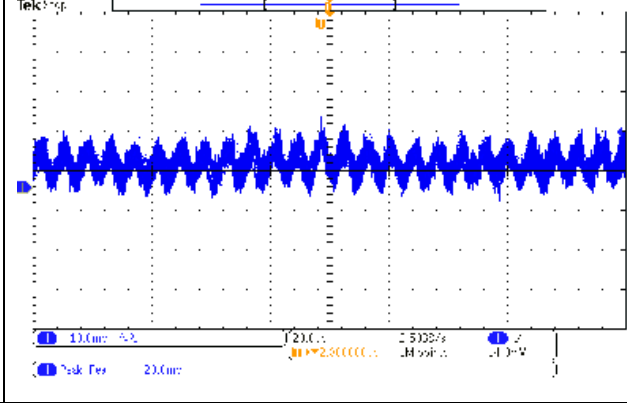
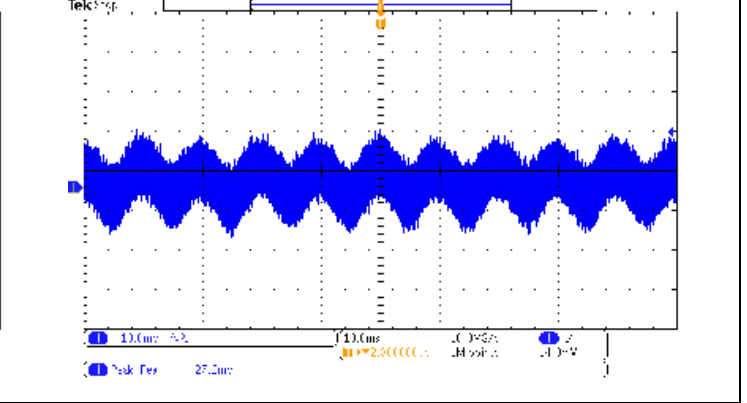


INPUT=115VAC/60HZ @ FULL LOAD

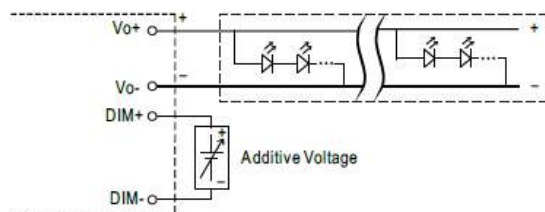
CH1 : Output Voltage CH2 : AC Input Voltage



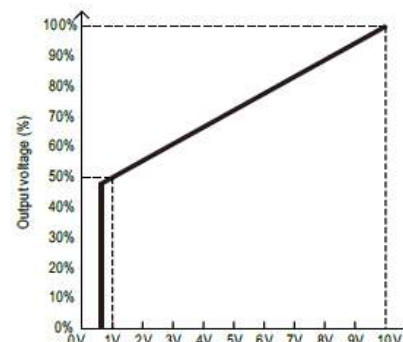
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |                                                                                                                    |                                                                            |                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RISE TIME (Max) | 230VAC/ 80ms for Blank type<br>115VAC/ 80ms for Blank type<br>230VAC/ 200ms for V type<br>115VAC/ 200ms for V type | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25°C<br>LEDH MODE TEST | 230VAC/33.6 ms for Blank type<br>115 VAC/39.92 ms for Blank type<br>230VAC/49.6 ms for V type<br>115 VAC/48.4 ms for V type |
| <div> <div> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage for V type</p>  </div> <div> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1 : Output Voltage for V type</p>  </div> </div> <div> <div> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage for Blank type</p>  </div> <div> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1 : Output Voltage for Blank type</p>  </div> </div> |                 |                                                                                                                    |                                                                            |                                                                                                                             |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | HOLD UP TIME    | 230VAC/ 10ms<br>115VAC/ 10ms                                                                                       | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25°C<br>LEDH MODE TEST | 230VAC/15.2 ms<br>115 VAC/18.38ms                                                                                           |
| <div> <div> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p>  </div> <div> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p>  </div> </div>                                                                                                                                                                                                                                                                                                                                                     |                 |                                                                                                                    |                                                                            |                                                                                                                             |

|    |                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                         |                                                                                   |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| 11 | DYNAMIC LOAD                                                                                                                                                                                                                                                                                                                                                                                          | V1: 1200mVp-p                                                                                                                                                                                                                                                                                                                                                                                                                                         | I/P: 230VAC<br>O/P:<br>(1)FULL /50% LOAD 50%DUTY / 120HZ<br>(2)FULL /50% LOAD 50%DUTY / 1KHZ<br>Ta:25°C | 640mVp-p FULL /50% LOAD 50%DUTY / 120HZ<br>632mVp-p FULL /50% LOAD 50%DUTY / 1KHZ |
|    | <div style="display: flex; justify-content: space-around;"> <div data-bbox="145 577 774 994"> <p>FULL /50% LOAD 50%DUTY / 120HZ</p>  </div> <div data-bbox="774 577 1524 994"> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                         |                                                                                   |
| 12 | RIPPLE & NOISE (Max)                                                                                                                                                                                                                                                                                                                                                                                  | V1: 150 mVp-p                                                                                                                                                                                                                                                                                                                                                                                                                                         | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25°C<br>CCH MODE TEST                                               | V1: 27.2mVp-p                                                                     |
|    | <div style="display: flex; justify-content: space-around;"> <div data-bbox="145 1144 774 1583"> <p>high frequency :</p>  </div> <div data-bbox="774 1144 1524 1583"> <p>low frequency :</p>  </div> </div>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                         |                                                                                   |
| 13 | DIMMING OPERATION (forV-Type)                                                                                                                                                                                                                                                                                                                                                                         | <p>※ 3 in 1 dimming function to adjust output voltage level</p> <ul style="list-style-type: none"> <li>• Output constant voltage can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 0 ~ 10VDC, or 10V PWM signal or resistance.</li> <li>• Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.</li> <li>• Dimming source current from power supply: 100µA (typ.)</li> </ul> |                                                                                                         |                                                                                   |

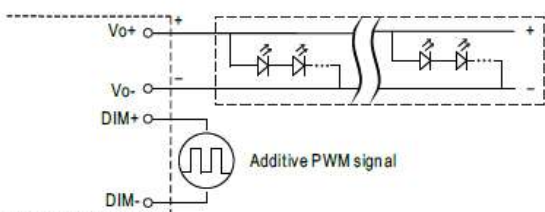
◎ Applying additive 0 ~ 10VDC



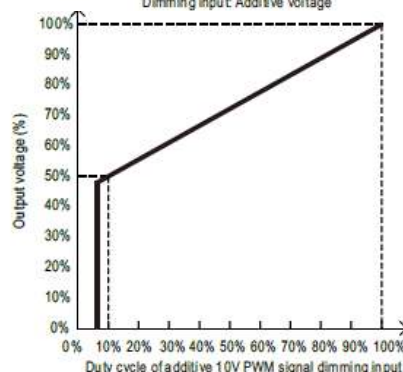
"DO NOT connect "DIM- to Vo-"



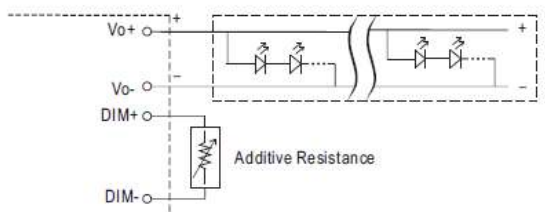
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



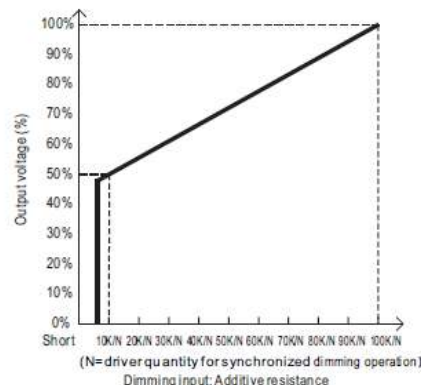
"DO NOT connect "DIM- to Vo-"



◎ Applying additive resistance:



"DO NOT connect "DIM- to Vo-"



Note : 1. Min. dimming level is about 50% of output voltage and the output voltage is not defined when  $V_{out} < 50V$   
2. The output voltage could drop down to 0V when dimming input is about 0k or 0Vdc, or 10V PWM signal with 0% duty cycle.

I/P 230 VAC O/P DIMMING TEST

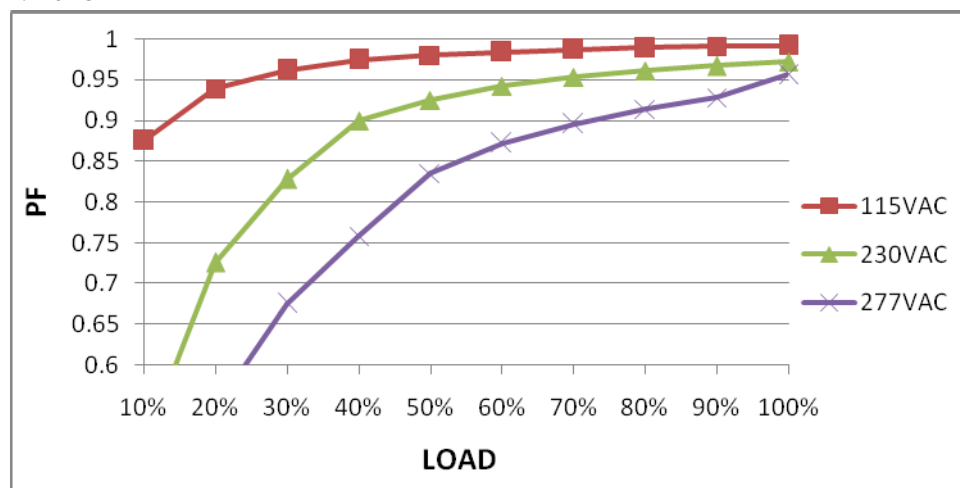
| 1 | V                      | SHORT     | 1V      | 2V      | 3V     | 4V     | 5V      | 6V      | 7V      | 8V      | 9V      | 10V    | OPEN     |
|---|------------------------|-----------|---------|---------|--------|--------|---------|---------|---------|---------|---------|--------|----------|
|   | Output Voltage         | 0.00000 V | 6.01    | 6.58    | 7.23   | 7.86   | 8.64    | 9.22    | 9.94    | 10.63   | 11.42   | 11.98  | 12.01    |
|   | %                      | 0.00%     | 50.08 % | 54.83 % | 60.25% | 65.50% | 72.00 % | 76.83 % | 82.83 % | 88.58 % | 95.17 % | 99.83% | 100.08 % |
|   |                        |           |         |         |        |        |         |         |         |         |         |        |          |
| 2 | PWM                    | 0V        | 10%     | 20%     | 30%    | 40%    | 50%     | 60%     | 70%     | 80%     | 90%     | 100%   | OPEN     |
|   | Output Voltage (100Hz) | 0.00000 V | 6.03    | 6.57    | 7.21   | 7.85   | 8.62    | 9.23    | 9.96    | 10.62   | 11.51   | 11.99  | 12.10    |
|   | %                      | 0.00%     | 50.25 % | 54.75 % | 60.08% | 65.42% | 71.83 % | 76.92 % | 83.00 % | 88.50 % | 95.92 % | 99.92% | 100.83 % |
|   |                        |           |         |         |        |        |         |         |         |         |         |        |          |
| 3 | R                      | 0%        | 10K     | 20K     | 30K    | 40K    | 50K     | 60K     | 70K     | 80K     | 90K     | 100K   | OPEN     |
|   | Output Voltage         | 0.00000 V | 6.07    | 6.71    | 7.39   | 8.22   | 8.89    | 9.54    | 10.21   | 10.83   | 11.45   | 11.90  | 12.01    |
|   | %                      | 0.00%     | 50.59 % | 55.92 % | 61.58% | 68.50% | 74.08 % | 79.50 % | 85.08 % | 90.25 % | 95.42 % | 99.17% | 100.08 % |
|   |                        |           |         |         |        |        |         |         |         |         |         |        |          |

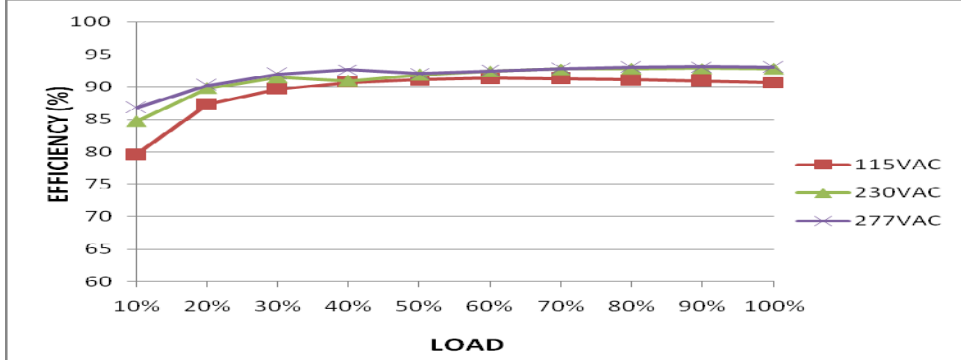
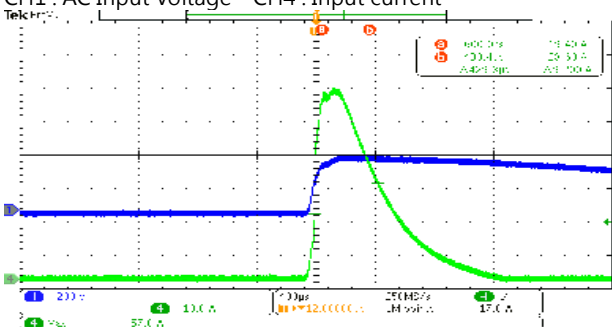
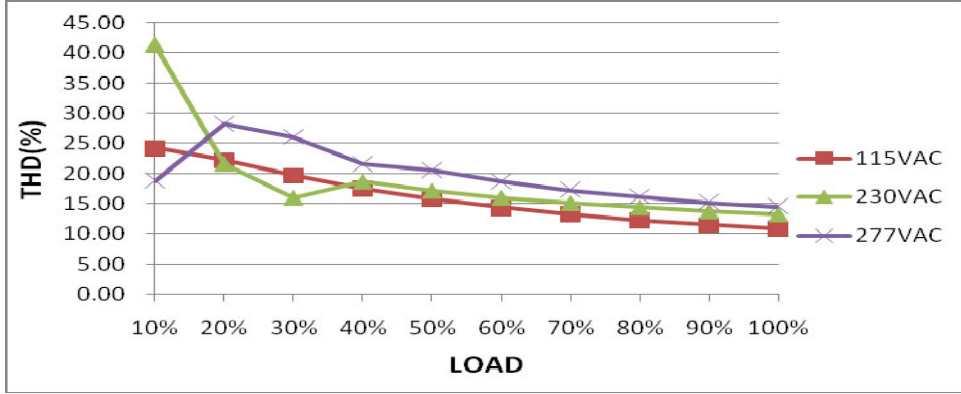
TEST RESULT OK

## INPUT FUNCTION TEST

| N<br>O | TEST ITEM                 | SPECIFICATION                                                              | TEST CONDITION                                                                                                                                                                                                                                                                                                                                                            | RESULT                                                                                                                                          |
|--------|---------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | INPUT VOLTAGE RANGE       | 100VAC~305 VAC<br>142VDC~431VDC                                            | (1) I/P:TESTING<br>O/P:FULL LOAD<br>(2) I/P:DC TESTING(L:+ N:-)<br>O/P: FULL / 50% LOAD<br>(3) I/P:DC TESTING(L:- N:+)<br>O/P: FULL / 50% LOAD<br>(PLEASE CHECK DERATING CURVE)<br>Ta:25°C<br><br>I/P:<br>LOW-LINE-3V=97 VAC<br>HIGH-LINE+10V=315 VAC<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 ) | (1) 97V~308VAC<br>(2)242Vdc~431Vdc/FULL LOAD<br>142Vdc~431Vdc/50% LOAD<br>(3) 242Vdc~431Vdc/FULL LOAD<br>142Vdc~431Vdc/50% LOAD<br><br>TEST: OK |
| 2      | INPUT FREQUENCY RANGE     | 47HZ ~63 HZ<br>NO DAMAGE                                                   | I/P: 110 VAC ~305VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C                                                                                                                                                                                                                                                                                                                      | OK                                                                                                                                              |
| 3      | INPUT CURRENT (TYP)       | 277VAC/ 0.9A<br>230 VAC/1.1A<br>115 VAC/2.2A                               | I/P: 277VAC/230 VAC/115 VAC<br>O/P:FULL LOAD<br>Ta:25°C                                                                                                                                                                                                                                                                                                                   | I= 0.64A/277VAC<br>I = 0.77A/ 230VAC<br>I = 1.55A/ 115VAC                                                                                       |
| 4      | STANDBY POWER CONSUMPTION | <0.5W for V-type only                                                      | I/P : 230 VAC<br>O/P : Output voltage dim to off<br>Ta : 25°C                                                                                                                                                                                                                                                                                                             | 0.4225W                                                                                                                                         |
| 5      | POWER FACTOR(TYP)         | 0.96/230 VAC FULL LOAD<br>0.97/115 VAC FULL LOAD<br>0.94/277 VAC FULL LOAD | I/P: 230 VAC/115VAC/277VAC<br>O/P:FULL LOAD<br>Ta:25°C                                                                                                                                                                                                                                                                                                                    | PF= 0.972/230V/100%LOAD<br>PF=0.992/115V/100%LOAD<br>PF=0.96/277V/100%LOAD                                                                      |

P.F vs LOAD



|                                                                                      |                           |                                                                   |                                                 |                                                                |
|--------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------|
| 6                                                                                    | EFFICIENCY (TYP)          | 92%                                                               | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25°C        | 92.77 %                                                        |
| EFFICIENCY vs LOAD                                                                   |                           |                                                                   |                                                 |                                                                |
|    |                           |                                                                   |                                                 |                                                                |
| 7                                                                                    | INRUSH CURRENT (TYP)      | 230 V/65A<br><br>(twid=550us measured at 50%<br>Ipeak) COLD START | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25°C        | I = 57A/ 230VAC<br><br>T50= 429.8 us                           |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1 : AC Input Voltage CH4 : Input current          |                           |                                                                   |                                                 |                                                                |
|   |                           |                                                                   |                                                 |                                                                |
| 8                                                                                    | TOTAL HARMONIC DISTORTION | THD<20%(@load ≧ 60%/115VC,230VAC; @load ≧ 75%/277VAC)             | I/P : 115/230VAC<br>O/P : 60% LOAD<br>Ta : 25°C | THD : 14.41%/ 60% Load/115VAC<br>THD : 16.03%/ 60% Load/230VAC |
|                                                                                      |                           |                                                                   | I/P : 277VAC<br>O/P : 75% LOAD<br>Ta : 25°C     | THD : 16.92%/75% Load/277VAC                                   |
| THD vs LOAD                                                                          |                           |                                                                   |                                                 |                                                                |
|  |                           |                                                                   |                                                 |                                                                |

## ROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                          | TEST CONDITION                                                        | RESULT                                                                                                                                                                   |
|----|-----------------------------|----------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | OVER CURRENT PROTECTION     | 95%~108%                               | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 110VAC<br>O/P: TESTING<br>Ta:25°C  | 101.7%/ 305VAC<br>101.3%/ 230VAC<br>101.2%/100VAC<br>PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed |
| 2  | OVER VOLTAGE PROTECTION     | V1: 13V~18V                            | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 110VAC<br>O/P: MIN LOAD<br>Ta:25°C | 14.43V/ 305VAC<br>14.43V/ 230VAC<br>14.44V/ 110VAC<br>PROTECTION TYPE : Shut down o/p voltage, re-power on to recover                                                    |
| 3  | OVER TEMPERATURE PROTECTION | NO DAMAGE                              | I/P: 305 VAC<br>I/P: 110 VAC<br>O/P: FULL LOAD                        | O.T.P. Active<br>PROTECTION TYPE : Shut down o/p voltage, re-power on to recover                                                                                         |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 305VAC<br>I/P: 110 VAC<br>O/P: FULL LOAD<br>Ta:25°C              | NO DAMAGE<br>PROTECTION TYPE : Hiccup mode or Constant current limiting, recovers automatically after fault condition is removed                                         |

## COMPONENT STRESS TEST

| N<br>O | TEST ITEM                                                   | SPECIFICATION           | TEST CONDITION                                                                                                                                                                                                                                                                                                                                                                    | RESULT                                                                                                           |
|--------|-------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1      | PWM Transistor<br>( D to S) or (C to E) <b>Peak Voltage</b> | Q73 Rated<br>11 A/ 600V | AC ON/OFF<br><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) LEDmax<br>(9) LEDmin | VDS:<br>(1) 468V<br>(2) 498V<br>(3) 472V<br>(4) 476V<br>(5) 468V<br>(6) 474V<br>(7) 501V<br>(8) 464V<br>(9) 476V |

|   |                                                               |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                              |
|---|---------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                               |                       | I/P:Low-Line -3V = 97V<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) LEDmax<br>(9)LEDmin<br><br>Ta:25°C                                                                                                                                                                                                                                                                                                                                                                      | VDS:<br>(1) 476V<br>(2) 480V<br>(3) 505V<br><br>(4) 460V<br>(5) 452V<br>(6) 492V<br>(7) 497V<br>(8) 448V<br>(9) 460V                                                                                                                         |
| 2 | P.F.C Transistor<br>( D to S) or (C to E) <b>Peak Voltage</b> | Q1 Rated<br>26A/ 600V | AC ON/OFF<br><br>I/P:High-Line +3V =308 V<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) LEDmax<br>(9)LEDmin<br><br>I/P:Low-Line -3V = 97V<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) LEDmax<br>(9)LEDmin<br>Ta:25°C | VDS:<br>(1) 522V<br>(2) 468V<br>(3) 513V<br><br>(4) 525V<br>(5) 513V<br>(6) 508V<br>(7) 472V<br>(8) 532V<br>(9) 535V<br><br>VDS:<br>(1) 515V<br>(2) 472V<br>(3) 519V<br>(4) 513V<br>(5) 508V<br>(6) 513V<br>(7) 527V<br>(8) 511V<br>(9) 508V |

|   |                    |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                  |
|---|--------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | P.F.C DIODE        | D5 Rated<br>9A/600V                                    | AC ON/OFF<br>I/P:High-Line +3V =308 V<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) LEDmax<br>(6)LEDmin<br><br>I/P:Low-Line -3V = 97V<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) LEDmax<br>(6)LEDmin<br>Ta:25°C | (1) 492V<br>(2) 436V<br>(3) 508V<br><br>(4) 513V<br><br>(5) 505V<br>(6) 508V<br><br>(1) 452V<br>(2) 476V<br>(3) 454V<br>(4) 448V<br>(5) 446V<br>(6) 462V                                                                                                                                         |
| 4 | Diode Peak Voltage | Q101 Rated<br>100A/ 40V<br><br>Q100 Rated<br>100A/ 40V | AC ON/OFF<br>I/P:High-Line +3V =308 V<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) LEDmax<br>(10)LEDmin<br><br>Ta:25°C                                                           | Q101:<br>VDS:<br>(1) 29.V<br>(2) 9.1V<br>(3) 29.3V<br>(4) 29.7V<br>(5) 29.5V<br>(6) 29.1V<br>(7) 22.5V<br>(8) 27.9V<br>(9) 29.3V<br>(10) 23.1V<br>Q100<br>VDS:<br>(1) 28.9V<br>(2) 6.7V<br>(3) 29.1V<br>(4) 29.3V<br>(5) 28.9V<br>(6) 29.1V<br>(7) 19.9V<br>(8) 26.9V<br>(9) 28.7V<br>(10) 23.5V |

|   |                         |                                                                                     |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                    |
|---|-------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | Input Capacitor Voltage | C5 Rated:<br>100uF / 450 V                                                          | 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>Ta:25°C                                                  | (1) 446V<br>(2) 434V<br>(3) 442V<br>(4) 442V                                                                                                                                                                                                                                       |
| 6 | Control IC Voltage Test | U1 Rated<br>– 0.3V~35V<br><br>U2 Rated<br>– 0.3V to 20V<br>U100 Rated<br>– 0.3V~32V | AC ON/OFF<br>I/P:High-Line +3V =308 V<br><br>FOR C.V MODE TYPE<br>O/P(1)FULL LOAD<br>(2) Output Short<br>(3)O.L.P<br>(4)O.V.P.<br>(5)NO LOAD VRmin.LOW LINE<br>FOR C.C MODE TYPE<br>O/P(6)LEDmax<br>(7)LEDmin | U2:<br>(1) 17.7V<br>(2) 17.9V<br>(3) 17.7V<br>(4) 16.1V<br>(5) 15.7V<br><br>U1:<br>(1) 17.6V<br>(2) 17.5V<br>(3) 17.7V<br>(4) 16.9V<br>(5) 13.9V<br>(6) 17.9V<br>(7) 17.7V<br><br>U100:<br>(1) 11.3V<br>(2) 11.3V<br>(3) 11.3V<br>(4) 14.3V<br>(5) 11.5V<br>(6) 11.9V<br>(7) 11.3V |

## SAFETY & EMC TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION         | TEST CONDITION                          | RESULT                            |
|----|----------------------|-----------------------|-----------------------------------------|-----------------------------------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 3.75KVAC/min | I/P-O/P: 4.125 KVAC/min<br><br>Ta:25°C  | I/P-O/P: 0.238mA<br><br>NO DAMAGE |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ  | I/P-O/P: 500 VDC<br><br>Ta:25°C         | I/P-O/P:9999MΩ<br><br>NO DAMAGE   |
| 3  | LEAKAGE CURRENT      | <0.25mA / 277VAC      | I/P: 277 VAC<br>O/P:Min LOAD<br>Ta:25°C | L-FG:0.048mA<br>N-FG:0.043 mA     |

### E.M.C TEST

| NO | TEST ITEM                                                                                                                         | SPECIFICATION                                              | TEST CONDITION                                      | RESULT                            |
|----|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------|
| 1  | HARMONIC                                                                                                                          | EN61000-3-2<br>CLASS C                                     | I/P: 230VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C        | PASS                              |
| 2  | CONDUCTION                                                                                                                        | EN55032<br>CLASS B                                         | I/P: 230 VAC (50HZ)<br>O/P:FULL/50% LOAD<br>Ta:25°C | PASS<br><br>Test by certified Lab |
| 3  | RADIATION                                                                                                                         | EN55032<br>CLASS B                                         | I/P: 230 VAC (50HZ)<br>O/P:FULL LOAD<br>Ta:25°C     | PASS<br><br>Test by certified Lab |
| 4  | E.S.D                                                                                                                             | EN61000-4-2<br>LIGHT INDUSTRY<br>AIR : 8KV / Contact : 4KV | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C       | CRITERIA A                        |
| 5  | E.F.T                                                                                                                             | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT: 1KV                | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C       | CRITERIA A                        |
| 6  | SURGE                                                                                                                             | IEC61000-4-5<br>INDUSTRY<br>L-N :2KV                       | 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 : NPF-200V-12<br>1. ROOM AMBIENT BURN-IN : 2HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=30 °C<br>2. HIGH AMBIENT BURN-IN : 2HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=47.8 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                    |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
|    |                                                                   | <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=30°C</th><th>HIGH AMBIENT Ta=47.8°C</th></tr><tr><td>1</td><td>RTH1</td><td>66.4°C</td><td>79.7°C</td></tr><tr><td>2</td><td>BD1</td><td>67.2°C</td><td>83.4°C</td></tr><tr><td>3</td><td>Q1</td><td>68.8°C</td><td>85.2°C</td></tr><tr><td>4</td><td>C5</td><td>64.3°C</td><td>80.3°C</td></tr><tr><td>5</td><td>L2</td><td>66.1°C</td><td>82.2°C</td></tr><tr><td>6</td><td>C86</td><td>67.9°C</td><td>84.1°C</td></tr><tr><td>7</td><td>Q71</td><td>65.8°C</td><td>82.3°C</td></tr><tr><td>8</td><td>Q73</td><td>66.5°C</td><td>83.2°C</td></tr><tr><td>9</td><td>U1</td><td>64.5°C</td><td>80.4°C</td></tr><tr><td>10</td><td>C36</td><td>65.8°C</td><td>82.4°C</td></tr><tr><td>11</td><td>T1</td><td>75.6°C</td><td>93.0°C</td></tr><tr><td>12</td><td>C106</td><td>68.6°C</td><td>86.6°C</td></tr><tr><td>13</td><td>Q100</td><td>74.8°C</td><td>92.9°C</td></tr><tr><td>14</td><td>Q101</td><td>74.5°C</td><td>92.5°C</td></tr><tr><td>15</td><td>U101</td><td>75.6°C</td><td>92.6°C</td></tr><tr><td>16</td><td>RTH5</td><td>65.0°C</td><td>81.4°C</td></tr><tr><td>17</td><td>TC</td><td>58.0°C</td><td>74.0°C</td></tr></table> |                                                                    |                     | NO | Position | ROOM AMBIENT Ta=30°C | HIGH AMBIENT Ta=47.8°C | 1 | RTH1 | 66.4°C | 79.7°C | 2 | BD1 | 67.2°C | 83.4°C | 3 | Q1 | 68.8°C | 85.2°C | 4 | C5 | 64.3°C | 80.3°C | 5 | L2 | 66.1°C | 82.2°C | 6 | C86 | 67.9°C | 84.1°C | 7 | Q71 | 65.8°C | 82.3°C | 8 | Q73 | 66.5°C | 83.2°C | 9 | U1 | 64.5°C | 80.4°C | 10 | C36 | 65.8°C | 82.4°C | 11 | T1 | 75.6°C | 93.0°C | 12 | C106 | 68.6°C | 86.6°C | 13 | Q100 | 74.8°C | 92.9°C | 14 | Q101 | 74.5°C | 92.5°C | 15 | U101 | 75.6°C | 92.6°C | 16 | RTH5 | 65.0°C | 81.4°C | 17 | TC | 58.0°C | 74.0°C |
| NO | Position                                                          | ROOM AMBIENT Ta=30°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | HIGH AMBIENT Ta=47.8°C                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 1  | RTH1                                                              | 66.4°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 79.7°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 2  | BD1                                                               | 67.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 83.4°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 3  | Q1                                                                | 68.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 85.2°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 4  | C5                                                                | 64.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 80.3°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 5  | L2                                                                | 66.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 82.2°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 6  | C86                                                               | 67.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 84.1°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 7  | Q71                                                               | 65.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 82.3°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 8  | Q73                                                               | 66.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 83.2°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 9  | U1                                                                | 64.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 80.4°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 10 | C36                                                               | 65.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 82.4°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 11 | T1                                                                | 75.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 93.0°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 12 | C106                                                              | 68.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 86.6°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 13 | Q100                                                              | 74.8°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 92.9°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 14 | Q101                                                              | 74.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 92.5°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 15 | U101                                                              | 75.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 92.6°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 16 | RTH5                                                              | 65.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 81.4°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 17 | TC                                                                | 58.0°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 74.0°C                                                             |                     |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 2  | OVER LOAD BURN-IN TEST                                            | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | I/P : 230 VAC<br>O/P : 103 % LOAD<br>Ta : 25°C                     | TEST : OK           |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2<br>HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | I/P : 305VAC/110VAC<br>O/P : FULL LOAD<br>Ta= -45/-30 °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 45 °C<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | I/P : 305 VAC<br>O/P : FULL LOAD<br>Ta= 45 °C<br>HUMIDITY= 95 %R.H | TEST : OK           |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03 %/(0°C~50°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | I/P : 230 VAC<br>O/P : FULL LOAD                                   | ± 0.01 %/°C(0~50°C) |    |          |                      |                        |   |      |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |    |     |        |        |    |    |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |      |        |        |    |    |        |        |

|    |                          |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                               |
|----|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6  | STORAGE TEMPERATURE 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 : 10CYCLE<br>5. Input/Output condition : STATIC                                                                                         |
| 7  | THERMAL SHOCK TEST       | -40~45°C                                                                                                                                                                                                                                                              | 1. Thermal shock Temperature : -45°C~ +50°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, 5G<br>10min./1cycle, 60min. each<br>along X, Y, Z axes                                                                                                                                                                                                    | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Sweep Time : 12min/sweep cycle<br>(4) Acceleration : 6G<br>(5) Test Time : 180min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                       |
| 9  | CAPACITOR LIFE CYCLE     | SUPPOSE C106 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta=25 °C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta=45 °C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta=45 °C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta=45 °C LIFE TIME | (1) 183069HRS<br>(2) 45137HRS<br>(3) 113601HRS<br>(4) 208682 HRS                                                                                                                                                                                                                                              |
| 10 | MTBF                     | Conducted by Parts Stress Analysis Prediction<br>829.6K hrs min. Telcordia SR-332 (Bellcore) ; 247.5K 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        | WUWQ/HUANGMK | WENF   | LINKX    |

2018.4.30

GP-A50-F010