



Test Report: NSP-1000-48

1000W AC/DC High Reliable Multi-Industrial Enclosed Type Power Supply

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

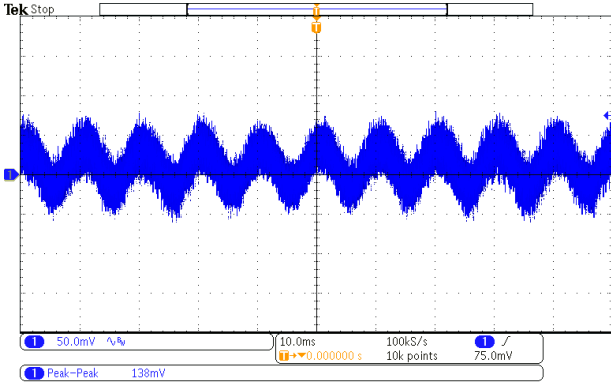
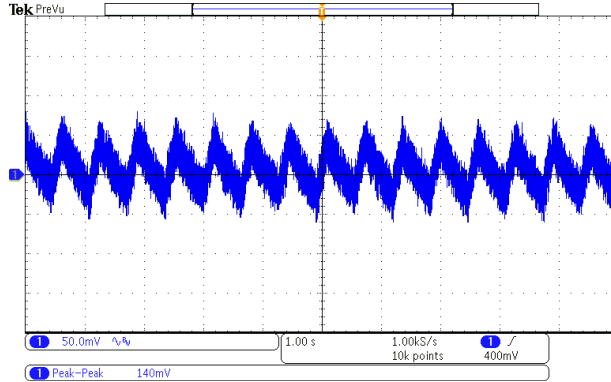
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

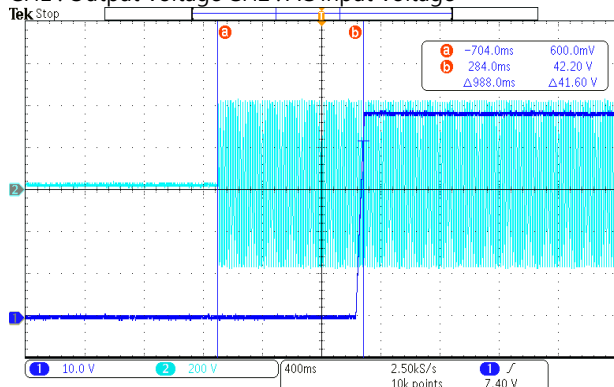
■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 43.2V~55V	I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	40.86V~57.86V/230VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1%~ 1%	I/P: 85VAC /305VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: 0.4%~ 0.6%
3	LINE REGULATION	V1: -0.5%~ 0.5%	I/P: 85VAC~ 305VAC O/P:FULL LOAD Ta:25°C	V1: -0.1%~0.12%
4	LOAD REGULATION	V1: -0.5%~ 0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.1%~ 0.25 %
5	OVER/UNDERSHOOT TEST	< ± 5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	3.2%
6	RIPPLE & NOISE (Max)	V1:300mVp-p	I/P: 230 VAC O/P: MIN LOAD—FULL LOAD Ta:25°C	V1: 140mVp-p / 100% load
high frequency :  low frequency : 				
7	SET UP TIME(Max)	277VAC/1500ms 230VAC/1500ms 115VAC/2500ms	I/P : 277VAC I/P : 230VAC I/P : 115VAC O/P : FULL LOAD Ta : 25°C	277VAC/ 988ms 230VAC/ 1198ms 115VAC/ 1950ms

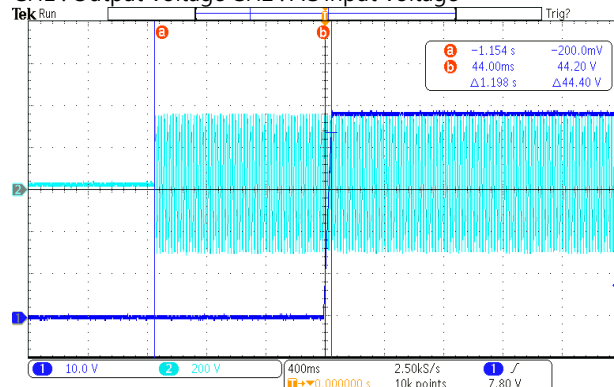
INPUT=277VAC/60HZ @ FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



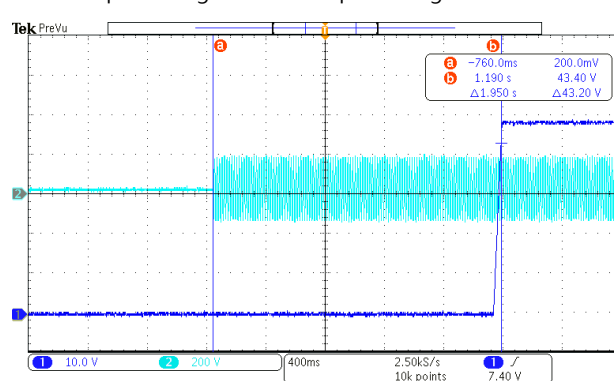
INPUT=230VAC/50HZ @ FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



INPUT=115VAC/60HZ @ FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



8

RISE TIME (Max)

277VAC/80ms

230VAC/80ms

115VAC/80ms

I/P : 277VAC

I/P : 230VAC

I/P : 115VAC

O/P : FULL LOAD

Ta : 25°C

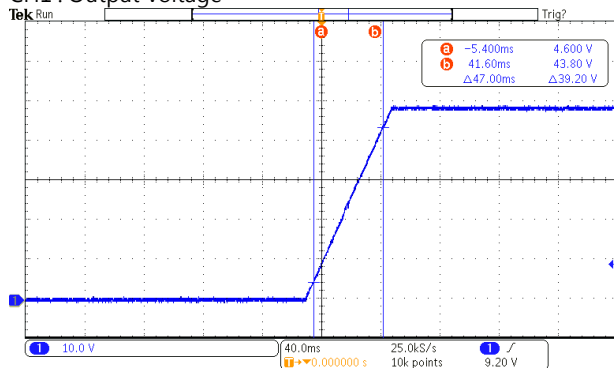
277VAC/ 47ms

230VAC/ 47ms

115VAC/ 46ms

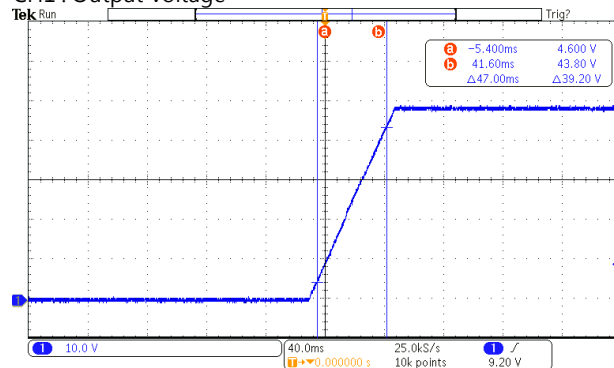
INPUT=277VAC/60HZ @ FULL LOAD

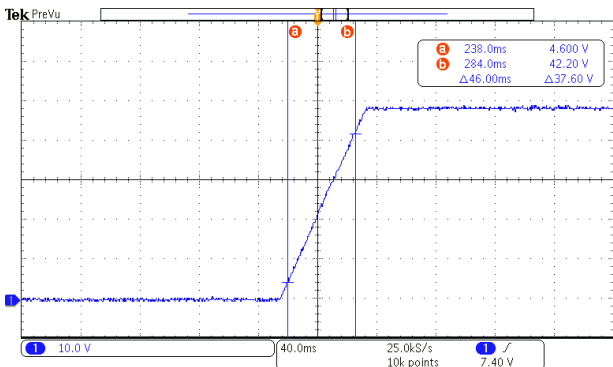
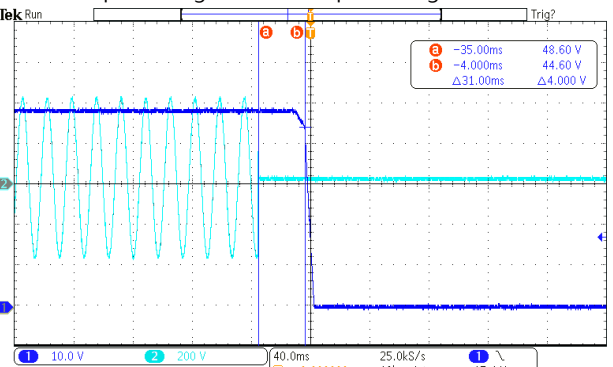
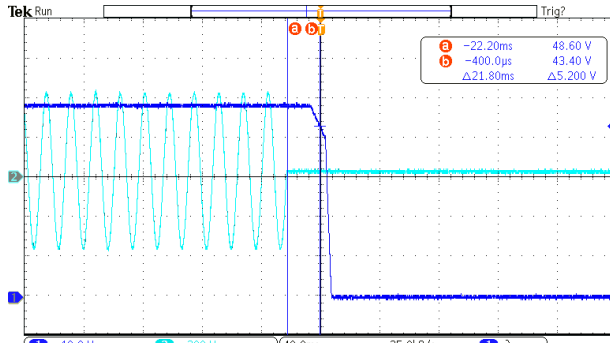
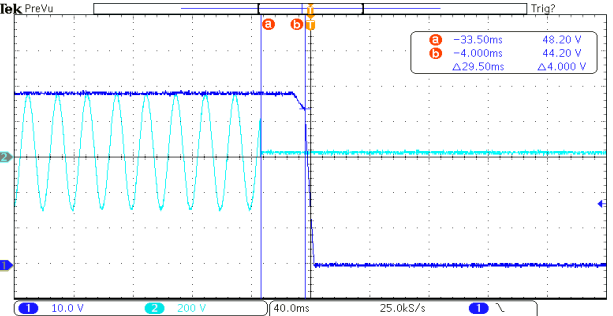
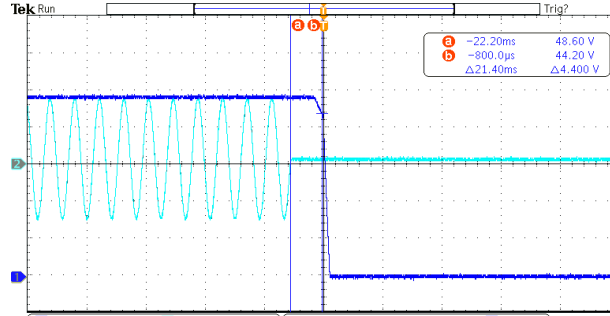
CH1 : Output Voltage



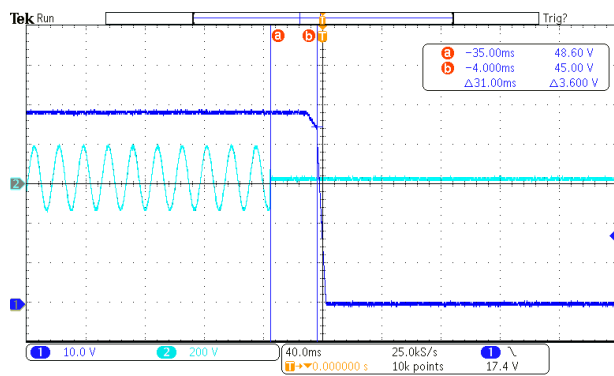
INPUT=230VAC/50HZ @ FULL LOAD

CH1 : Output Voltage

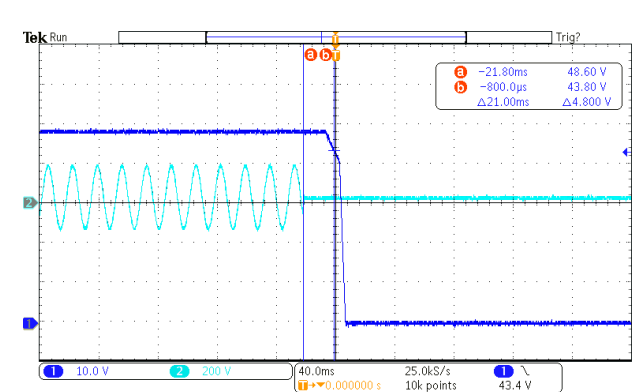


INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage				
				
9	HOLD UP TIME (Typ.)	12ms@70%load 8ms@full load	I/P : 277 VAC I/P : 230VAC I/P : 115 VAC O/P : 70%LOAD/FULL LOAD Ta : 25°C	FULL LOAD 277VAC: 21.8ms 230VAC: 21.4ms 115VAC: 21ms 70% LOAD 277VAC: 31ms 230VAC: 29.5ms 115VAC: 31ms
INPUT=277VAC/60HZ@70% LOAD CH1 : Output Voltage CH2 : AC Input Voltage			INPUT=277VAC/60HZ@FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage	
				
INPUT=230VAC/50HZ@70% LOAD CH1 : Output Voltage CH2 : AC Input Voltage			INPUT=230VAC/50HZ@FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage	
				

INPUT=115VAC/60HZ@70% LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

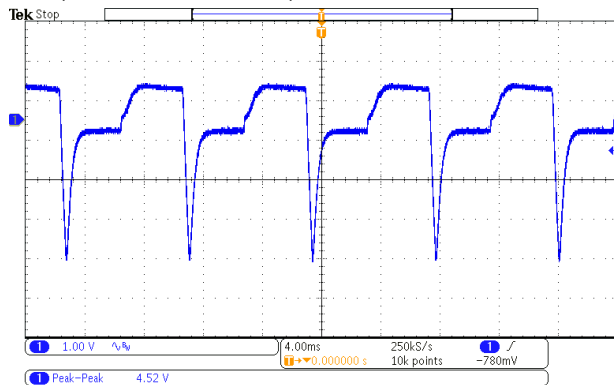


INPUT=115VAC/60HZ@FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

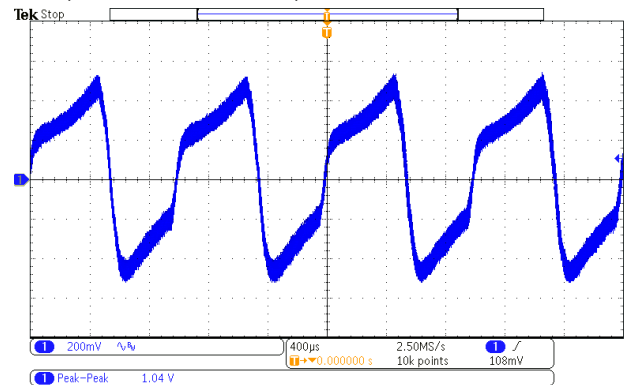


10	DYNAMIC LOAD	V1: 9600mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	4520mVp-p 1040mVp-p
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FULL /50% LOAD 50%DUTY / 120HZ



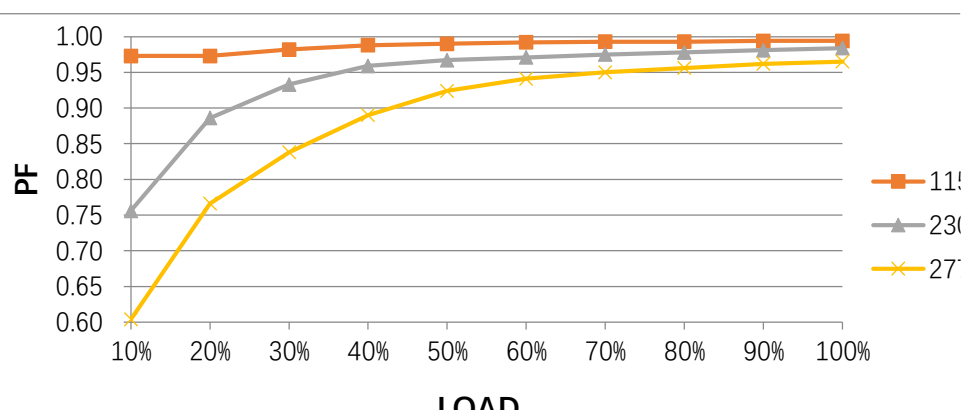
FULL /50% LOAD 50%DUTY / 1KHZ

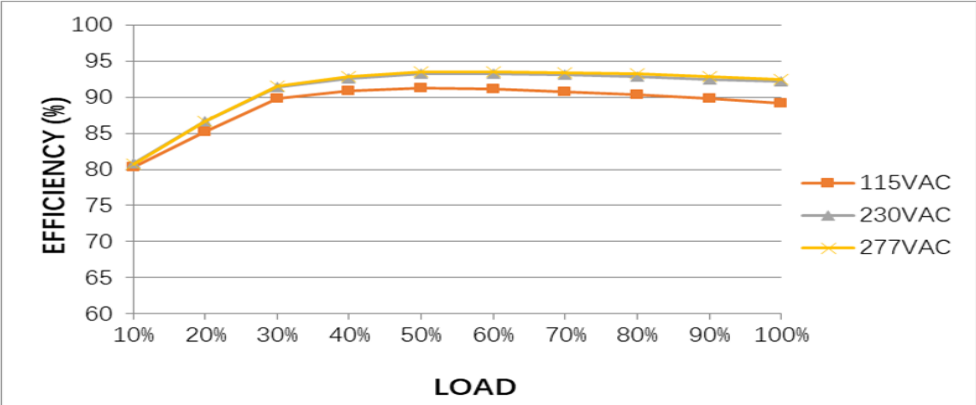
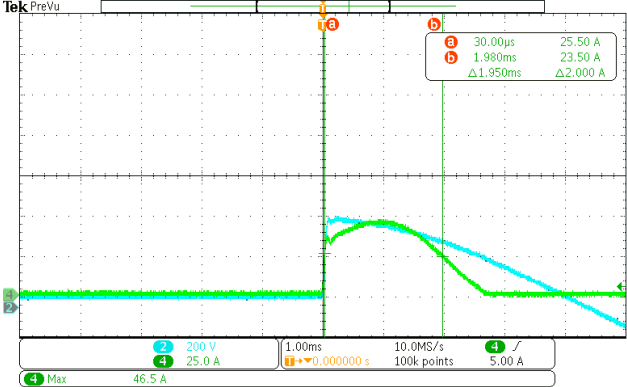
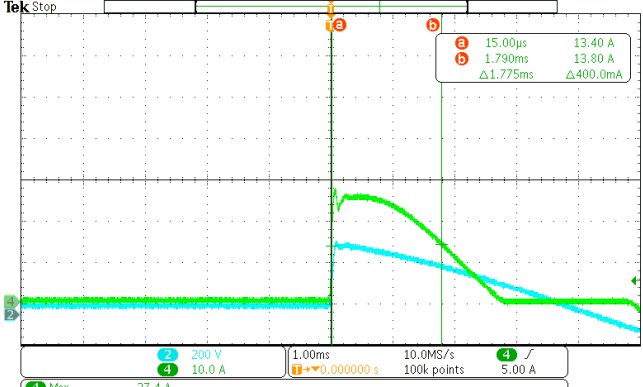
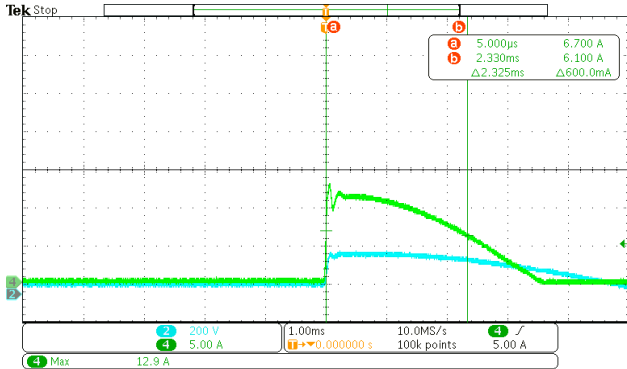


INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	85VAC~305VAC 120VDC~ 431VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD Ta:25°C	(1)72V~308VAC (2) 120Vdc~431Vdc/FULL LOAD 120Vdc~431Vdc/50% LOAD (3) 120Vdc~431Vdc/FULL LOAD 120Vdc~431 Vdc/50% LOAD
			I/P: LOW-LINE-3V=82V HIGH-LINE+10V=315 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST:PASS
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:85VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: PASS
3	INPUT CURRENT (Typ.)	277V/ 5A 230V/ 6A 115V/ 12A	I/P : 277VAC I/P : 230VAC I/P : 115VAC O/P : FULL LOAD Ta : 25°C	I =4.0A/ 277VAC I =4.8A/ 230VAC I =9.8A/ 115VAC
4	LEAKAGE CURRENT	Earth leakage current < 350 μ A(rms)@277VAC	I/P : 277 VAC O/P : Min LOAD Ta : 25°C	L-FG : 230.2 μ A N-FG : 229.6 μ A
		Touch current <100 μ A (rms)@277 VAC		L-V+: 72.4 μ A L-V-: 73.2 μ A N-V+: 73.4 μ A N-V-: 73.4 μ A
5	POWER FACTOR (Typ.)	0.92/277VAC 0.95/ 230VAC 0.98/ 115VAC	I/P : 277VAC I/P : 230VAC I/P : 115VAC O/P : FULL LOAD Ta : 25°C	PF=0.965/277VAC PF=0.984/230VAC PF=0.994/115VAC

P.F vs LOAD

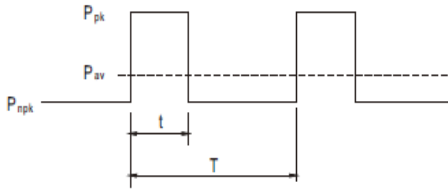
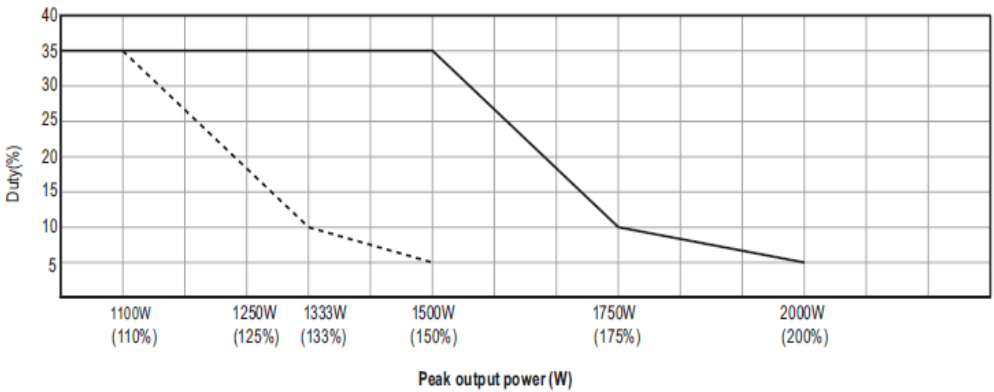


6	EFFICIENCY(Typ.)	94%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	94.5%
EFFICIENCY vs LOAD 				
7	INRUSH CURRENT(Typ.)	50A/277VAC 40A/230VAC 25A/115VAC COLD START	I/P : 277VAC I/P : 230VAC I/P : 115VAC O/P : FULL LOAD Ta : 25°C	I =46.5A/ 277VAC T50=1950us/277V I =27.4A/230VAC T50=1775us/230V I =12.9A/ 115VAC T50=2325us/115V
INPUT=277VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH4 : Input current  INPUT=230VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH4 : Input current  INPUT=115VAC/50HZ @ FULL LOAD CH2 : AC Input Voltage CH4 : Input current 				

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105 % ~ 200 %	I/P: 305VAC I/P: 230VAC I/P: 85VAC O/P: TESTING Ta: 25°C	112%/ 305VAC 112%/ 230VAC 112%/85VAC Protection type : Peak Load Mode: From 105% to 200% of rated output power, unit will shut down after 5 seconds of continuous operation. AC repower on to recover. At >200% of rated output power, constant current limiting is activated. Unit will shut down after 5 seconds of continuous operation. AC repower on to recover. Current Limiting Mode: Constant current limiting, recovers automatically after abnormal condition is removed.
2	OVER VOLTAGE PROTECTION	56V~63V	I/P: 305VAC I/P: 230VAC I/P: 85VAC O/P: MIN LOAD Ta: 25°C	58.7V/ 305VAC 58.7V/ 230VAC 58.7V/ 85VAC Protection type : Shut down and latch off output voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 305VAC I/P: 85VAC O/P: FULL LOAD	O.T.P. Active Protection type : Shut down output voltage, recovers automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC I/P: 85VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Protection type : Peak Load Mode: Constant current limiting, unit will shut down after 5 Sec, AC repower on to recover. Current Limiting Mode: Constant current limiting, recovers automatically after abnormal condition is removed.

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PEAK POWER	■ Function Manual 1. Peak Power $P_{av} = \frac{P_{pk} \times t + P_{npk} \times (T-t)}{T} \leq P_{rated}$ $Duty = \frac{t}{T} \times 100\% \leq 35\%$ $t \leq 5 \text{ sec}$  P_{av}: Average output power (W) P_{pk}: Peak output power (W) P_{npk}: Non-peak output power (W) P_{rated}: Rated output power (W) t: Peak power width(sec) T: Period(sec)  For example (24V model) $V_{in}=220Vac$, $Duty_max=5\%$ $P_{av}=P_{rated}=1000W$ $P_{pk}=2000W$ $t \leq 5sec$ $T \geq \frac{5sec}{5\%} = 100sec$ $P_{npk} \leq \frac{TP_{av}-tP_{pk}}{T-t} = 947.4W$ Note: When the output voltage is adjusted to the upper limit, the peak power is 150% of rated power I/P: 100/200 VAC O/P: PEAK LOAD Ta: 25°C TEST RESULT : PASS		

2

OUTPUT VOLTAGE PROGRAMMABLE(PV)

2. Output Voltage Programming(P.V)

(1)Default by potentiometer (SVR)

(a)Set DIP switch position-3 to OFF(refer to the illustration on the right).

(b)Output voltage can be trimmed by SVR.

(2)By Output Voltage Programming

(a)Set DIP switch position-3 to ON(refer to the illustration on the right).

(b)The output voltage can be trimmed to 0~120% by applying EXTERNAL VOLTAGE between PV and GND on CN1.

Pin5 PV

Pin11 GND

External Voltage (Vdc)

CN1

+Vo

-Vo

DIP switch

128.7(15V)

114.6(48V)

120(other)

OUTPUT VOLTAGE(%)

Non-Linear

1

0

4.7

4.8

Vdc

EXTERNAL VOLTAGE (Vdc)

I/P: 230 VAC

O/P:FULL LOAD

Ta:25°C

TEST RESULT :

External voltage(DC)	<0.4V	1V	2.596V	4.7V	4.8V
SPEC(%)	0%	0%~6%	50%±5%	114.6%±5%	114.6%±5%
Vout(%)	0%	0.461V(0.96%)	23.65V(49.27%)	54.16V(112.84%)	55.5V(115.63%)

3

OUTPUT CURRENT PROGRAMMABLE (PC)

3. Output Current Programming(P.C)

(1)Default Overload Protection(OLP) value

(a)Have the DIP switch position-2 set as

(b)Output current is set default value.

(2)By Constant Current Level Programming

(a)Have the DIP switch position-2 set as

(b)The constant current level can be trimmed to 0~100% of the rated current by applying EXTERNAL VOLTAGE between PC and GND on CN1.

Pin6 PC

Pin11 GND

External Voltage (Vdc)

CN1

+Vo

-Vo

DIP switch

100

OUTPUT CURRENT(%)

Non-Linear

1

0

4.7

4.8

Vdc

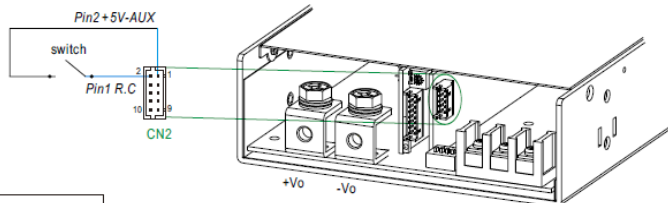
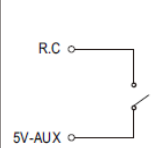
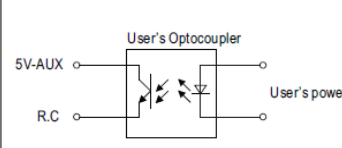
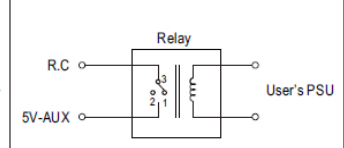
EXTERNAL VOLTAGE (Vdc)

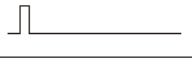
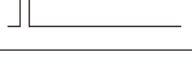
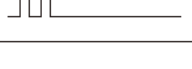
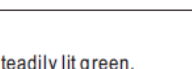
I/P: 230 VAC

O/P:TESTING

Ta:25°C

External voltage(DC)	<0.4V	1V	2.831V	4.7V	4.8V
SPEC(%)	0%	0%~6%	50%±5%	100%±5%	100%±5%
Iout(%)	0%	3%	49.79%	99.52%	101.19%

4	REMOTE CONTROL	4.Remote Control ※ The power supply can be turned ON/OFF individually or along with other units by using the "Remote Control" function with external switch, potocoupler or relay.  <table border="1"><thead><tr><th>PSU Vo Status</th><th>Between +5V-AUX(Pin 2) and R.C(Pin 1)</th></tr></thead><tbody><tr><td>Power ON</td><td>Switch Short</td></tr><tr><td>Power OFF</td><td>Switch Open</td></tr></tbody></table>  R.C. by external switch.  R.C. by user's optocoupler control module.  R.C. by user's Relay control module. I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result : <table border="1"><thead><tr><th>Between +5V-AUX(Pin2) and R.C(Pin1)</th><th>Power Supply Status</th></tr></thead><tbody><tr><td>SW SHORT</td><td>ON</td></tr><tr><td>SW OPEN</td><td>OFF</td></tr></tbody></table>			PSU Vo Status	Between +5V-AUX(Pin 2) and R.C(Pin 1)	Power ON	Switch Short	Power OFF	Switch Open	Between +5V-AUX(Pin2) and R.C(Pin1)	Power Supply Status	SW SHORT	ON	SW OPEN	OFF
PSU Vo Status	Between +5V-AUX(Pin 2) and R.C(Pin 1)															
Power ON	Switch Short															
Power OFF	Switch Open															
Between +5V-AUX(Pin2) and R.C(Pin1)	Power Supply Status															
SW SHORT	ON															
SW OPEN	OFF															
5	REMOTE SENSE	S+ / S->0.5V Compensate voltage drop on the load wiring up to 0.5V.	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	> 0.5V												
6	AUXILIARY POWER	1.Auxiliary voltage output, 10.2~13.8V, referenced to GND-AUX (pin2). The maximum load current is 0.8A. This output has the built-in "Oring diodes" and is not controlled by "Remote ON-OFF". 2.Auxiliary voltage output, 4.25~5.75V, referenced to GND-AUX (pin2). The maximum load current is 0.3A. This output has the built-in "Oring diodes" and is not controlled by "Remote ON-OFF" I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result : <table border="1"><thead><tr><th>AUX</th><th>TOLERANCE</th><th>RIPPLE</th><th>TEST RESULT</th></tr></thead><tbody><tr><td>12V / 0.8A</td><td>10.2~13.8 V</td><td>150mVp-p</td><td>11.92V/ 113mVp-p</td></tr><tr><td>5V / 0.2A</td><td>4.25~5.75 V</td><td>450mVp-p</td><td>4.83V/114 mVp-p</td></tr></tbody></table>			AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.8A	10.2~13.8 V	150mVp-p	11.92V/ 113mVp-p	5V / 0.2A	4.25~5.75 V	450mVp-p	4.83V/114 mVp-p
AUX	TOLERANCE	RIPPLE	TEST RESULT													
12V / 0.8A	10.2~13.8 V	150mVp-p	11.92V/ 113mVp-p													
5V / 0.2A	4.25~5.75 V	450mVp-p	4.83V/114 mVp-p													
7	DC OK SIGNAL	I/P:230VAC O/P: FULL LOAD Ta:25°C TEST : OK														

8	LED Status indicators	※ LED Status Indicators		
		Description		Output of alarm
		Normal operation		Green : Steadily lit 
		Remote off		Red : Steadily lit 
		Internal over-temperature		Orange : 1 Blink/Pause  
		Overload/Short		Red : 1 Blink/Pause  
		Over voltage		Red : 2 Blink/Pause  
		Over temperature		Red : 3 Blink/Pause  
		Fan fail		Red : 4 Blink/Pause  
		AC under voltage		Red : 5 Blink/Pause  
		Others (Note)		Red : 6 Blink/Pause  
Note: 1. Others include hardware fault etc. 2. In PC mode, both OLP and SCP operate in constant current limiting, with the indicator steadily lit green. I/P:230VAC O/P:FULL LOAD Ta:25°C TEST :PASS				
9	FAN NOISE (Typ.)	10% load @18 dB 70% load @24 dB Built-in intelligent fan speed control detect by PSU' S internal temperature	I/P : 230 VAC O/P : TESTING Ta : 25°C	10% load: 16.39dB 70% load: 23.33dB

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q53 Rated:650V/33.7A	AC ON/OFF I/P:High-Line +3V =308V VDS: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8)0%~150%LOAD (9)0%LOAD~SHORT I/P:Low-Line -3V = 82V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C	VDS: (1) 456V (2) 442V (3) 504V (4) 500V (5) 504V (6) 512V (7) 516V (8) 43.2V (9) 51.3V VDS: (1) 540V (2) 520V (3) 516V (4) 516V (5) 512V (6) 504V (7) 508V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated: 650V/53A	I/P:High-Line +3V =308V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load.	VDS: (1) 466V (2) 433V (3) 462V (4) 466V (5) 450V (6) 441V (7) 433V

			I/P:Low-Line -3V =82V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C	VDS: (1) 582V (2) 614V (3) 614V (4) 606V (5) 622V (6) 534V (7) 458V
3	P.F.C DIODE	D4 Rated: 20A/650V	I/P:High-Line +3V =308 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz I/P:Low-Line -3V = 82V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25°C	(1) 483V (2) 483V (3) 504V (4) 508V (1) 524V (2) 495V (3) 532V (4) 520V
4	Diode Peak Voltage	Q100 Rated 60A/250V Q103 Rated 60A/250V	AC ON/OFF I/P:High-Line +3V =308 V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8).NO LOAD Ta:25°C	Q101: VDS: (1) 180V (2) 169V (3) 189V (4) 199V (5) 169V (6) 169V (7) 171V (8) 183V

				Q104: VDS: (1) 185V (2) 163V (3) 181V (4) 177V (5) 183V (6) 173V (7) 157V (8) 185V
5	Input Capacitor Voltage	C5 Rated: 470μ/450V Surge voltage: 495V	I/P:High-Line +3V =308V O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Full Load /Min load Change (4)Full load continue Ta:25°C	(1)454V (2)446V (3)458V (4) 446V
6	Control IC Voltage Test	PWM IC U500 Rated: 8V~30V PFC IC U1 Rated: 11.9V~25V O/P IC U100 Rated: 4.2V~30V	AC ON/OFF I/P:High-Line +3V =308 V O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. (5)NO LOAD VRmin(LOW LINE) Ta:25°C	U500 (1) 17V (2) 17.2V (3) 17V (4) 17.2V (5) 17.2V U1: (1) 17.8V (2) 18V (3) 17.8V (4) 17.6V (5) 17.8V U100 (1) 12.26V (2) 12.26V (3) 12.18V (4) 12.18V (5) 12.18V

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4 K VAC/min I/P-FG : 2 K VAC/min O/P-FG: 1.5 KVAC/min	I/P-O/P: 4.4 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C	I/P - O/P: 3.254 mA I / P - F G : 2.821 mA O / P - F G : 1.849 m A NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500 VDC>100MΩ I / P - F G : 500 VDC>100MΩ O/P-FG: 500 VDC >100MΩ	I/P-O/P: 500 VDC I / P - F G : 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P - O/P: >9999 MΩ I / P - F G : 9999 MΩ O / P - F G : 9999 MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	14mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	EN55032 EN55014-1 EN55011	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	EN55032 EN55014-1 EN55011	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 AIR : 15KV / Contact : 8KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	IEC61000-4-5 L-N : 2KV L,N-PE : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare 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 : NSP-1000-48 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=30.2 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P : 230VAC O/P : FULL LOAD Ta=60.7 °C <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=30.2 °C</th><th>HIGH AMBIENT Ta=60.7 °C</th></tr><tr><td>1</td><td>LF2</td><td>37.1°C</td><td>67.6°C</td></tr><tr><td>2</td><td>BD1</td><td>55.4°C</td><td>85.9°C</td></tr><tr><td>3</td><td>Q1</td><td>52.6°C</td><td>83.1°C</td></tr><tr><td>4</td><td>D4</td><td>50.7°C</td><td>81.2°C</td></tr><tr><td>5</td><td>L1</td><td>44.1°C</td><td>74.6°C</td></tr><tr><td>6</td><td>C5</td><td>39.8°C</td><td>70.3°C</td></tr><tr><td>7</td><td>U1</td><td>43.5°C</td><td>74.0°C</td></tr><tr><td>8</td><td>U2</td><td>46.2°C</td><td>76.7°C</td></tr><tr><td>9</td><td>Q50</td><td>49.6°C</td><td>80.1°C</td></tr><tr><td>10</td><td>Q51</td><td>50.2°C</td><td>80.7°C</td></tr><tr><td>11</td><td>Q52</td><td>46.8°C</td><td>77.3°C</td></tr><tr><td>12</td><td>Q53</td><td>46.5°C</td><td>77.0°C</td></tr><tr><td>13</td><td>L3</td><td>71.9°C</td><td>102.4°C</td></tr><tr><td>14</td><td>T1</td><td>73.8°C</td><td>104.3°C</td></tr><tr><td>15</td><td>D100</td><td>54.5°C</td><td>85.0°C</td></tr><tr><td>16</td><td>L100</td><td>53.1°C</td><td>83.6°C</td></tr><tr><td>17</td><td>C110</td><td>41.6°C</td><td>72.1°C</td></tr><tr><td>18</td><td>U100</td><td>62.1°C</td><td>92.6°C</td></tr><tr><td>19</td><td>Q102</td><td>51.9°C</td><td>82.4°C</td></tr><tr><td>20</td><td>R118</td><td>58.9°C</td><td>89.4°C</td></tr><tr><td>21</td><td>RTH5</td><td>37.6°C</td><td>68.1°C</td></tr><tr><td>22</td><td>RTH6</td><td>49.2°C</td><td>79.7°C</td></tr><tr><td>23</td><td>RT31</td><td>44.9°C</td><td>75.4°C</td></tr><tr><td>24</td><td>RT32</td><td>43.8°C</td><td>74.3°C</td></tr><tr><td>25</td><td>C14</td><td>37.4°C</td><td>67.9°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta=30.2 °C	HIGH AMBIENT Ta=60.7 °C	1	LF2	37.1°C	67.6°C	2	BD1	55.4°C	85.9°C	3	Q1	52.6°C	83.1°C	4	D4	50.7°C	81.2°C	5	L1	44.1°C	74.6°C	6	C5	39.8°C	70.3°C	7	U1	43.5°C	74.0°C	8	U2	46.2°C	76.7°C	9	Q50	49.6°C	80.1°C	10	Q51	50.2°C	80.7°C	11	Q52	46.8°C	77.3°C	12	Q53	46.5°C	77.0°C	13	L3	71.9°C	102.4°C	14	T1	73.8°C	104.3°C	15	D100	54.5°C	85.0°C	16	L100	53.1°C	83.6°C	17	C110	41.6°C	72.1°C	18	U100	62.1°C	92.6°C	19	Q102	51.9°C	82.4°C	20	R118	58.9°C	89.4°C	21	RTH5	37.6°C	68.1°C	22	RTH6	49.2°C	79.7°C	23	RT31	44.9°C	75.4°C	24	RT32	43.8°C	74.3°C	25	C14	37.4°C	67.9°C
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 112 % LOAD Ta : 25°C	TEST : OK																																																																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/90VAC O/P : 60%/ 100 % LOAD Ta= -45/-35 °C	TEST : OK																																																																																																								

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60 °C/95 %R.H NO DAMAGE	I/P : 315 VAC O/P : FULL LOAD Ta= 65 °C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	±0.03 %/°C(0~60°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.003 %/°C(0~60°C)
6	STORAGE TEMPERATURE TEST	-40~85°C	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/output condition : STATIC	
7	THERMAL SHOCK TEST	-30~60°C	1. Thermal shock Temperature : -35°C~ +65°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 16 CYCLE 5. Input/output condition : 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test	
8	VIBRATION TEST	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes	(1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C	
9	CAPACITOR LIFE CYCLE	SUPPOSE C110 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta=25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=60 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=60 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=60 °C LIFE TIME		(1) 951714HRS (2) 148506HRS (3) 187577HRS (4) 226499HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 910.8K hrs min. Telcordia SR-332 (Bellcore) ; 87.5K hrs min. MIL-HDBK-217F (25°C)		
11	Ongoing Reliability Test	I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 50,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQIN/ZHOUBIAO	WENF	WUWQ

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