Test Report: NSP-1000-12

1000W AC/DC High Reliable Multi-Industrial Encolsed 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

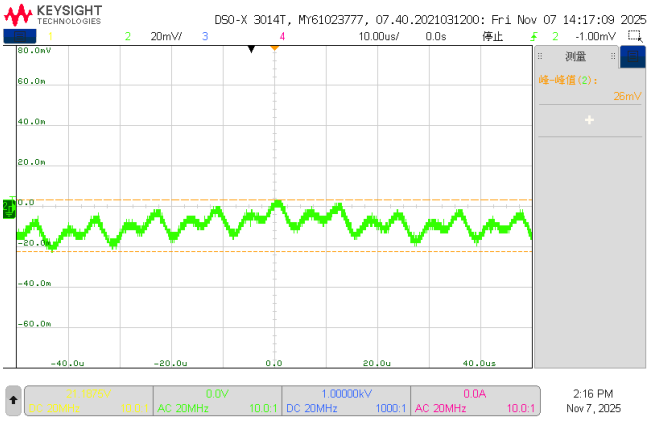
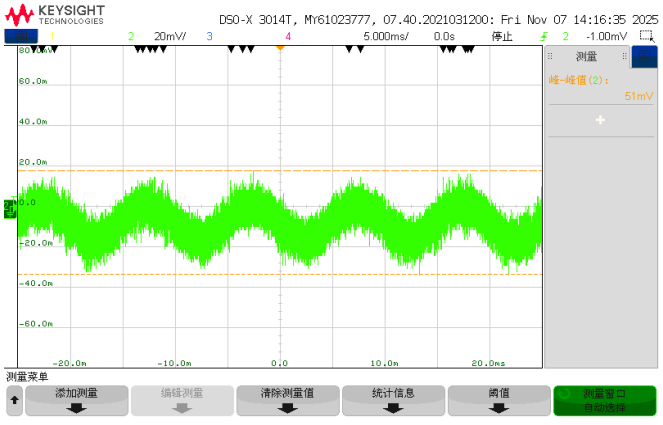
Safety Test
E.M.C. Test

■ RELIABILITY TEST

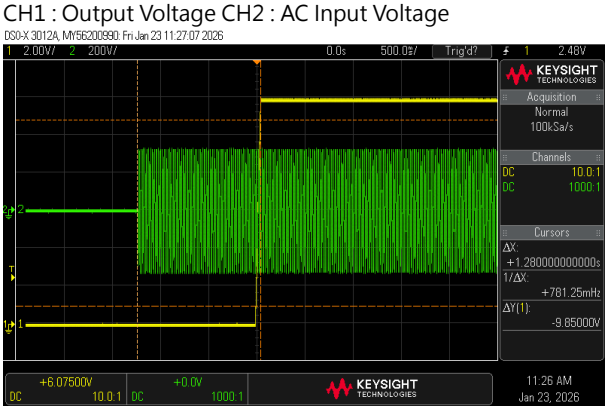
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

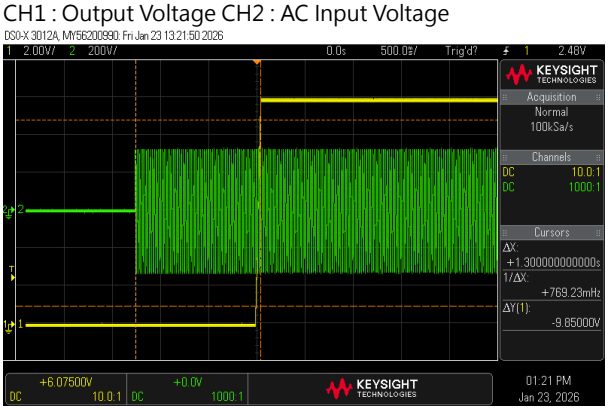
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 10.8V~14.4V	I/P： 230 VAC O/P：MIN LOAD Ta：25℃	10.18V~15.03V/230VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1%~ 1%	I/P: 85VAC /305VAC O/P:FULL/ MIN. LOAD Ta:25℃	V1:0.5%~ 0.75%
3	LINE REGULATION	V1: -0.5%~ 0.5%	I/P: 85VAC~ 305VAC O/P:FULL LOAD Ta:25℃	V1:-0.08%~ 0%
4	LOAD REGULATION	V1: -0.5%~ 0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.16%~0.16%
5	OVER/UNDERSHOOT TEST	<± 5%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	3.9%
6	RIPPLE & NOISE (Max)	V1: 150mVp-p	I/P: 230 VAC O/P: MIN LOAD—FULL LOAD Ta:25℃	V1: 51mVp-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℃	277VAC/1280ms 230VAC/1300ms 115VAC/1640ms

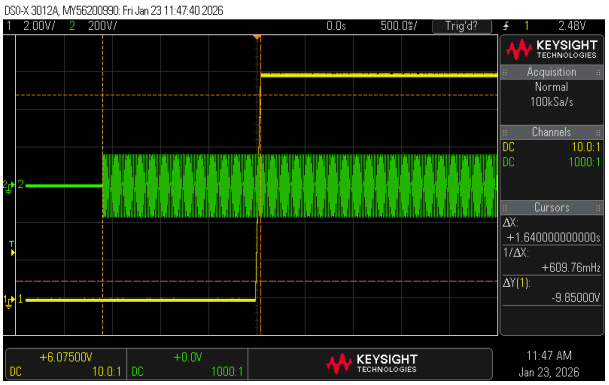
INPUT=277VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage



INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

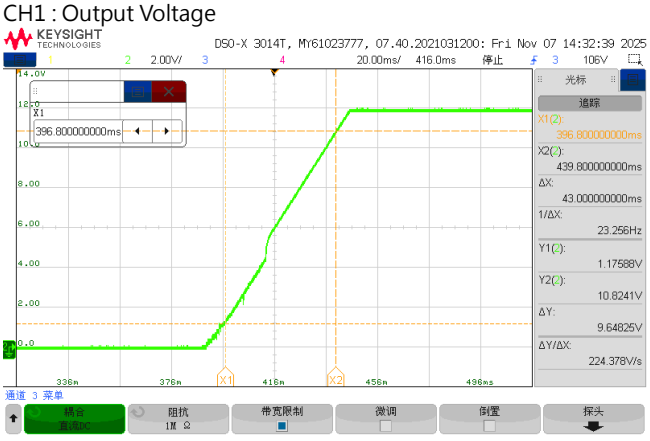


INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

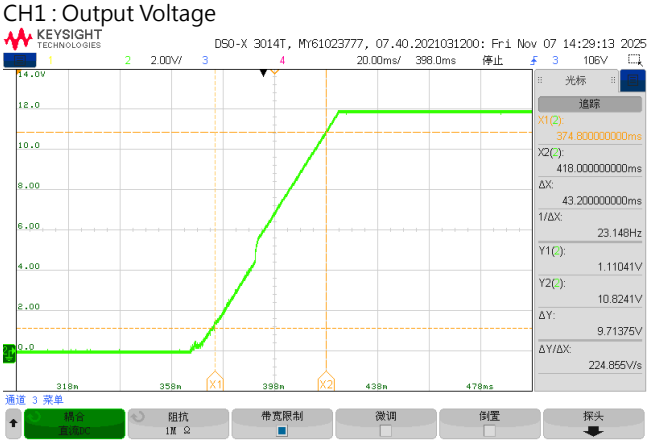


8	RISE TIME (Max)	277VAC/80ms 230VAC/80ms 115VAC/80ms	I/P： 277VAC I/P： 230VAC I/P： 115VAC O/P：FULL LOAD Ta：25℃	277VAC/43ms 230VAC/43.2ms 115VAC/44.4ms

INPUT=277VAC/60HZ @ FULL LOAD
CH1 : Output Voltage

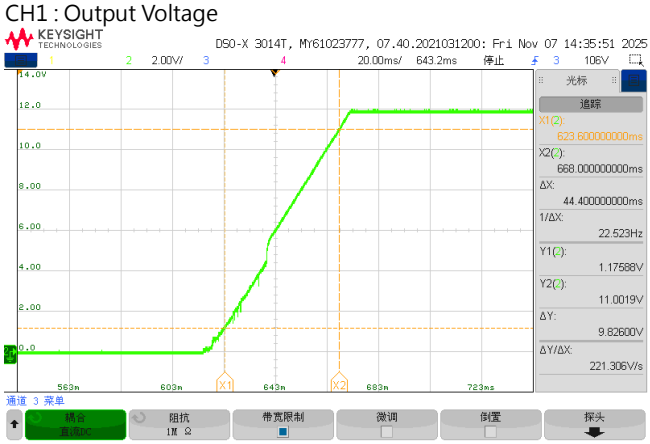


INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage



INPUT=115VAC/60HZ @ FULL LOAD

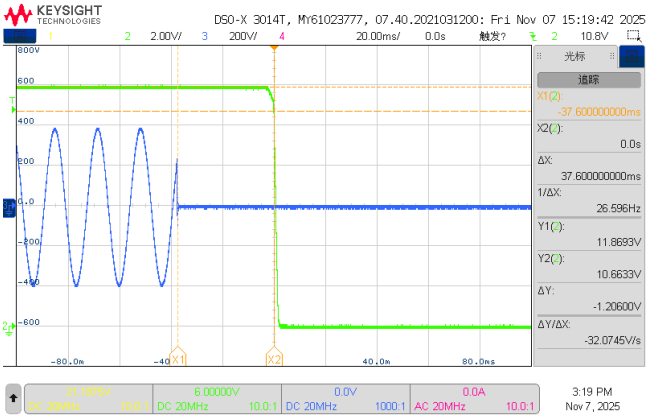
CH1 : Output Voltage



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℃	277VAC: 37.6ms/26.4ms 230VAC: 38.8ms/27.2ms 115VAC: 37.8ms/26.2ms

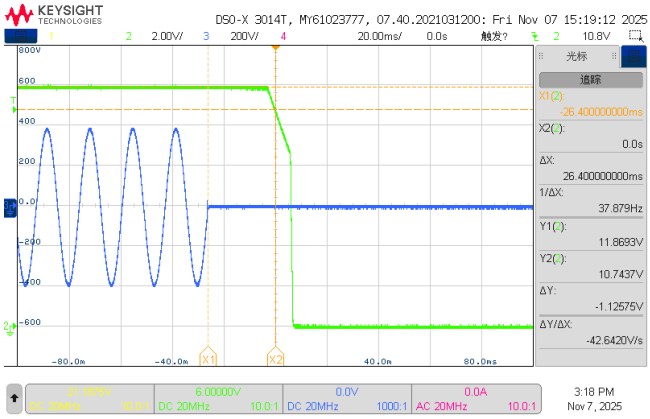
INPUT=277VAC/60HZ@70% LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



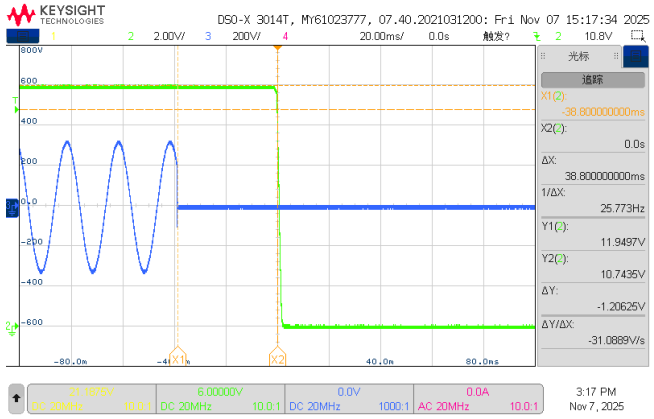
INPUT=277VAC/60HZ@FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



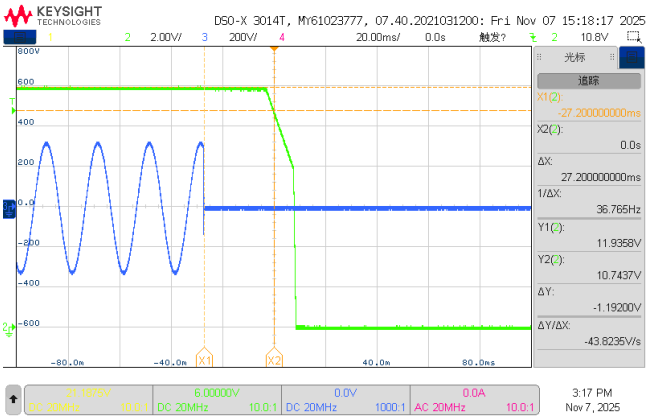
INPUT=230VAC/50HZ@70% LOAD

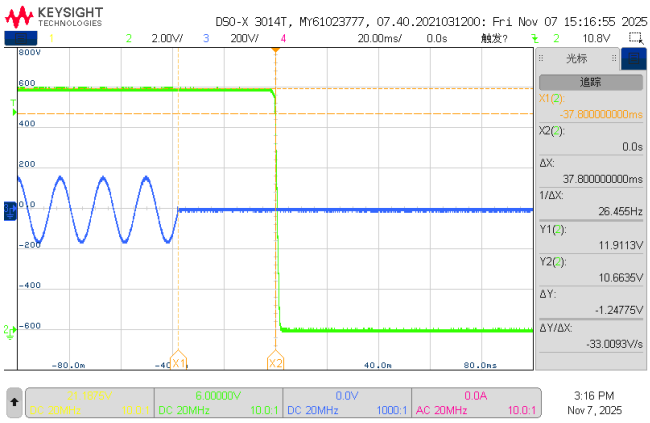
CH1 : Output Voltage CH2 : AC Input Voltage

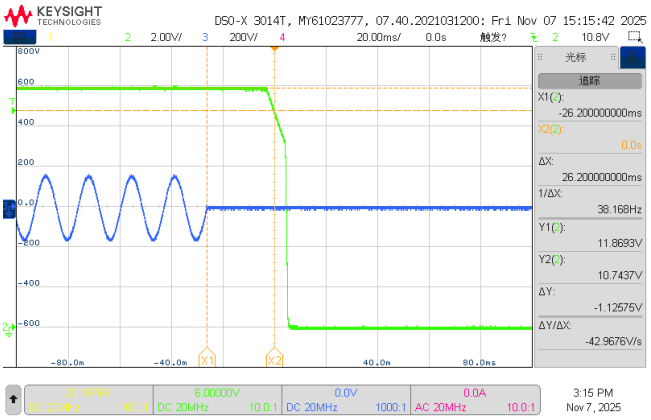


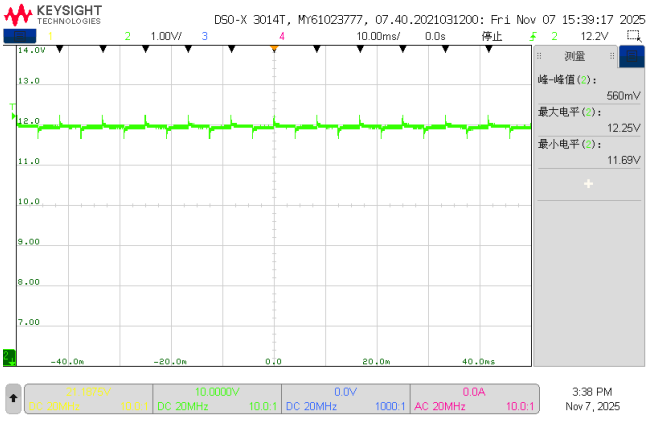
INPUT=230VAC/50HZ@FULL LOAD

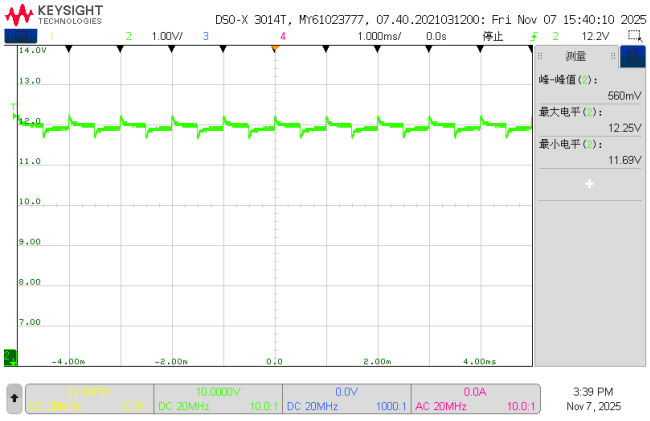
CH1 : Output Voltage CH2 : AC Input Voltage



<table>
<tr><td></td><td colspan="4">INPUT=115VAC/60HZ@70% LOAD
CH1 : Output Voltage CH2 : AC Input Voltage
 

INPUT=115VAC/60HZ@FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage
 
</td></tr>
<tr><td>10</td><td>DYNAMIC LOAD</td><td>V1: 2400mVp-p</td><td>I/P: 230VAC
O/P:
(1)FULL /50% LOAD 50%DUTY / 120HZ
(2)FULL /50% LOAD 50%DUTY / 1KHZ
Ta:25℃</td><td>560mVp-p

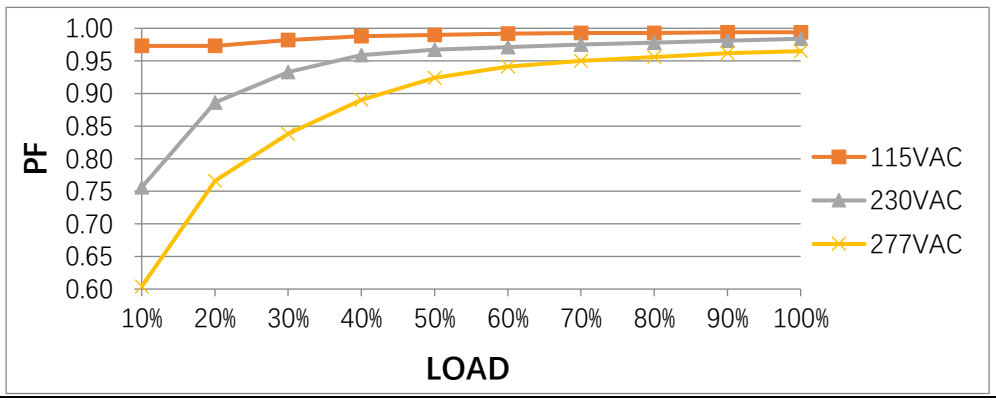
560mVp-p</td></tr>
<tr><td></td><td colspan="4">FULL /50% LOAD 50%DUTY / 120HZ
 

FULL /50% LOAD 50%DUTY / 1KHZ
 
</td></tr>
</table>

INPUT FUNCTION TEST

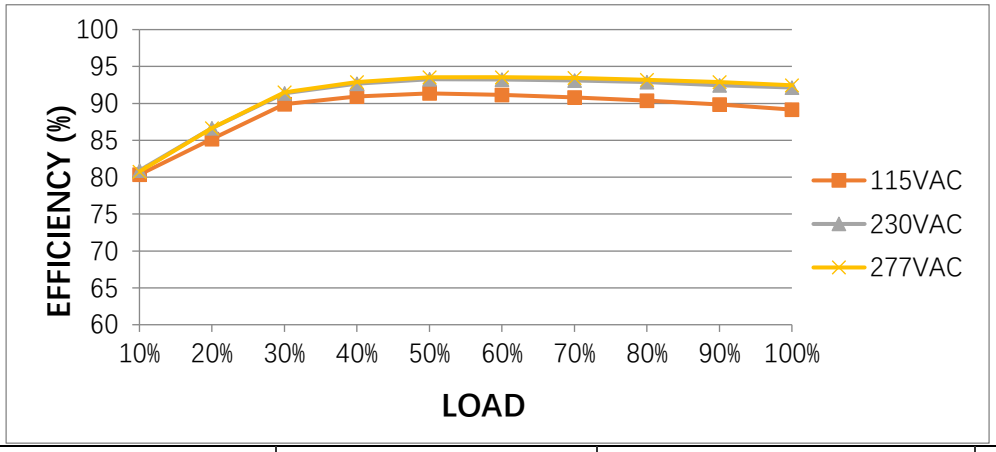
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	85VAC~305VAC 120VDC~ 431VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD Ta:25℃	(1)72V~308VAC (2) 120Vdc~431Vdc/FULL LOAD 120Vdc~431Vdc/50% LOAD (3) 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℃	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℃	I =4.04A/ 277VAC I =4.8A/ 230VAC I =9.79A/ 115VAC
4	LEAKAGE CURRENT	Earth leakage current < 350μA(rms)@277VAC	I/P： 277 VAC O/P：Min LOAD Ta：25℃	L-FG： 222.8 μA N-FG：221.6μA
		Touch current <100μA (rms)@277 VAC		L-V+: 77.4 μA L-V-: 76.2μA N-V+:77.4μA N-V-:76.4μA
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℃	PF=0.965/277VAC PF=0.984/230VAC PF=0.994/115VAC

P.F vs LOAD



6	EFFICIENCY(Typ.)	92%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	92.17%

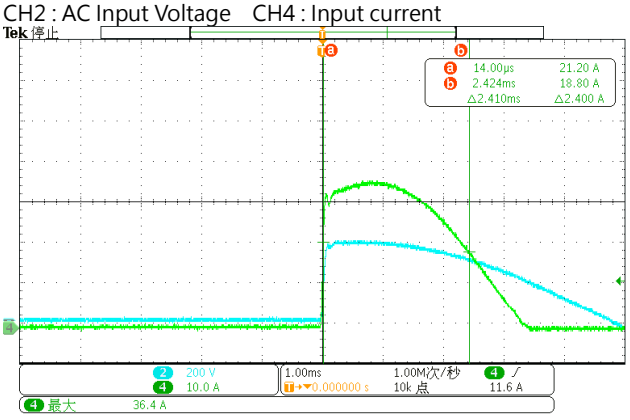
EFFICIENCY vs LOAD



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℃	I =36.4A/ 277VAC T50= 2410us/277V I =26.8A/230VAC T50= 1530 us/230V I =13.2A/ 115VAC T50=1520us/115V

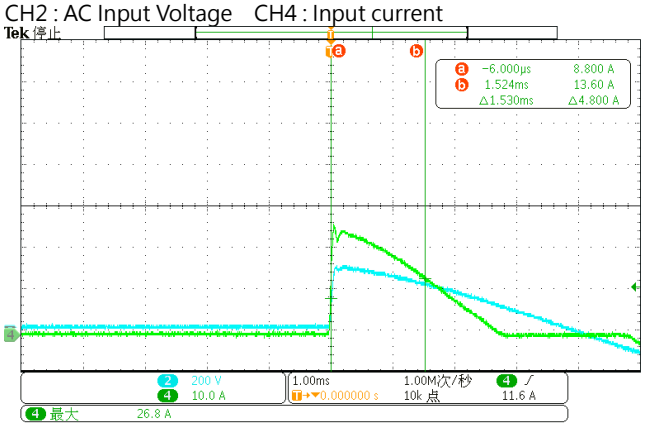
INPUT=277VAC/50HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current



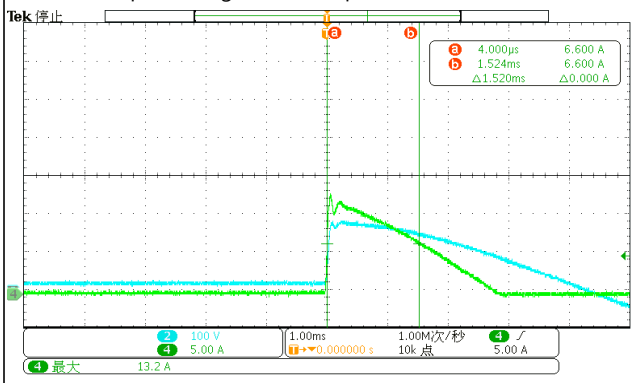
INPUT=230VAC/50HZ @ FULL LOAD

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℃	111.5%/ 305VAC 110.8%/ 230VAC 111.1%/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	15V~19V	I/P: 305VAC I/P: 230VAC I/P: 85VAC O/P:MIN LOAD Ta:25℃	17.0V/ 305VAC 17.0V/ 230VAC 17.0V/ 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℃	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

$$P_{av} = \frac{P_{pk} \times t + P_{npk} \times (T-t)}{T} \leq P_{rated}$$

$$Duty = \frac{t}{T} \times 100\% \leq 35\%$$

$t \leq 5$ sec

P_{av}: Average output power (W)

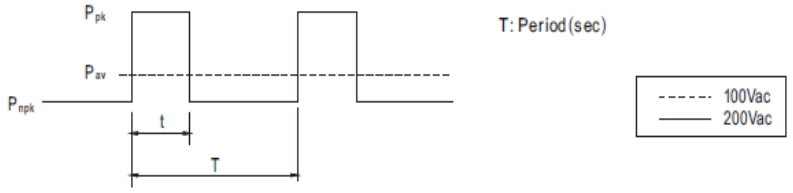
P_{pk} : Peak output power (W)

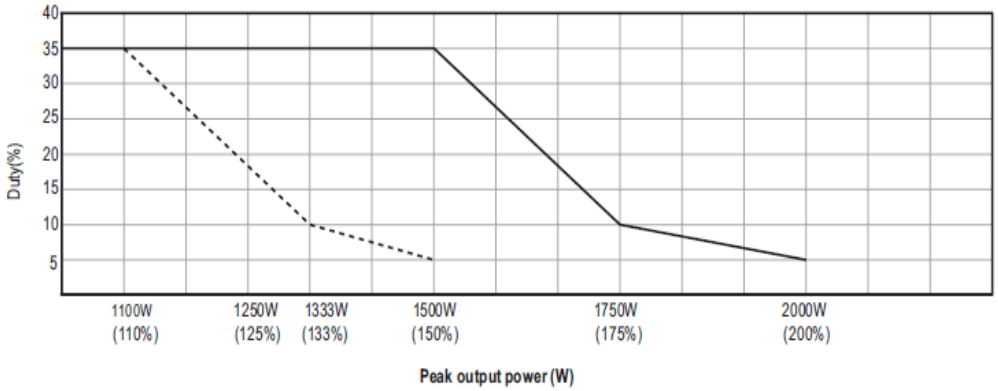
P_{npk} : Non-peak output power (W)

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≤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

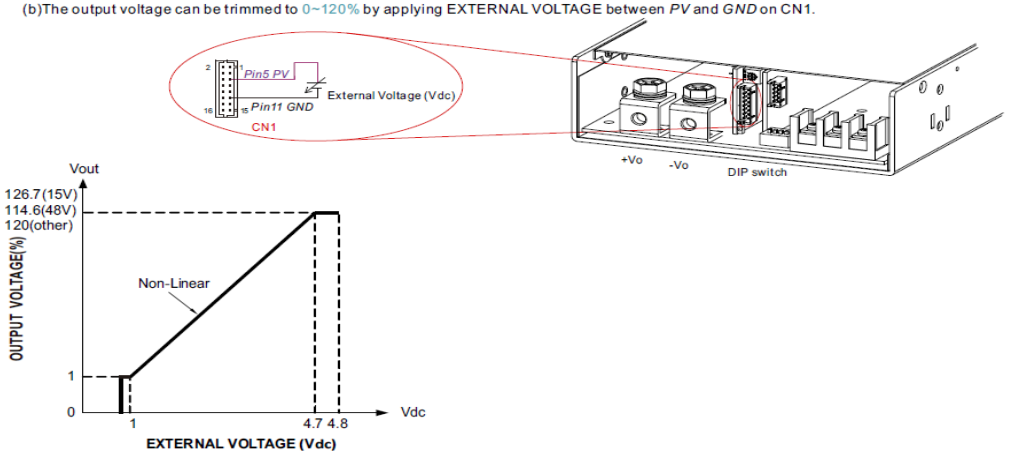
I/P: 100/200 VAC

O/P:PEAK LOAD

Ta:25℃

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.



I/P: 230 VAC

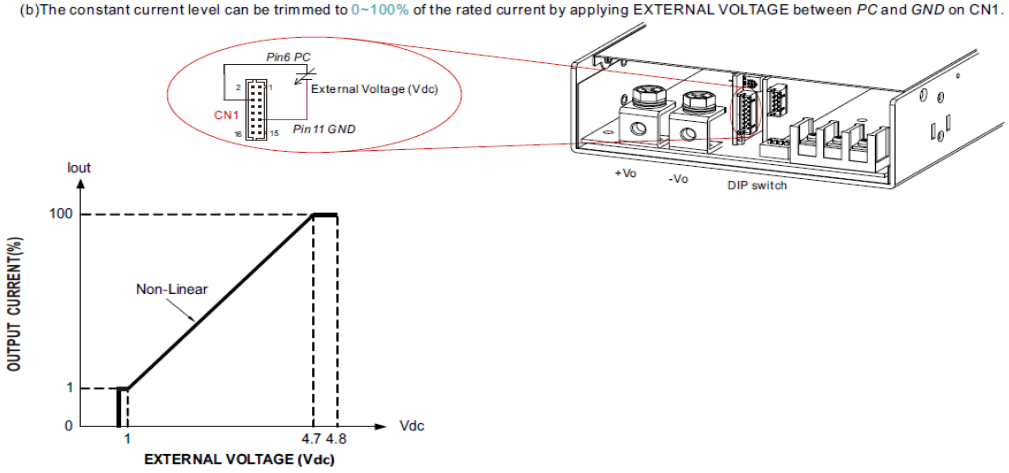
O/P:FULL LOAD

Ta:25℃

TEST RESULT :

External voltage(DC)	<0.4V	1V	2.524V	4.7V	4.8V
SPEC(%)	0%	0%~6%	50%±5%	120%±5%	120%±5%
Vout(%)	0%	0.115V(0.96%)	5.84V(48.67%)	14.18V(118.17%)	14.57V(121.42%)

3	OUTPUT CURRENT PROGRAMMABLE (PC)	**3.Output Current Programming(P.C)** (1)Default Overload Protection(OLP) value (a)Set DIP switch position-2 to OFF(refer to the illustration on the right). (b)Output current is set default value. (2)By Constant Current Level Programming (a)Set DIP switch position-2 to ON(refer to the illustration on the right). (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.



I/P: 230 VAC

O/P:TESTING

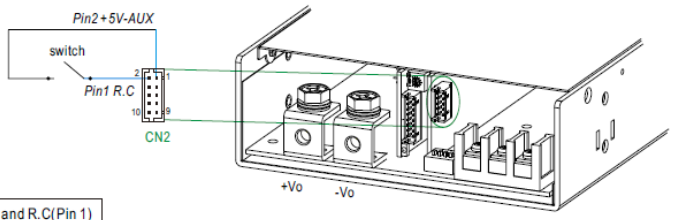
Ta:25℃

External voltage(DC)	<0.4V	1V	2.831V	4.7V	4.8V
SPEC(%)	0%	0%~6%	50%±5%	100%±5%	100%±5%
Iout(%)	0%	2.22%	50.06%	101.17%	102.85%

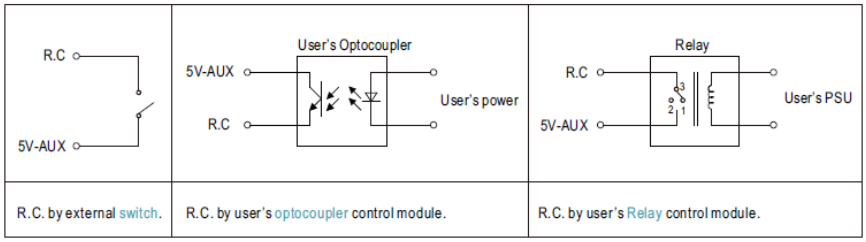
<table>
<tr><td>4</td><td>REMOTE CONTROL</td><td>

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.



PSU Vo Status	Between +5V-AUX(Pin 2) and R.C(Pin 1)
Power ON	Switch Short
Power OFF	Switch Open



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℃
Test Result：

Between +5V-AUX(Pin2)) and R.C(Pin1)	Power Supply Status
SW SHORT	Power on
SW OPEN	Power off

</td></tr>
<tr><td>5</td><td>REMOTE SENSE</td><td>

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℃	>0.52V

</td></tr>
<tr><td>6</td><td>AUXILIARY POWER</td><td>

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 0.2A. 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℃
Test Result：

AUX	TOLERANCE	RIPPLE	TEST RESULT
12V / 0.8A	10.2~13.8V	450mVp-p	11.91V/42mV
5V / 0.2A	4.25~5.75V	150mVp-p	4.70V/34mV

</td></tr>
<tr><td>7</td><td>DC OK SIGNAL</td><td>

I/P:230VAC
O/P: FULL LOAD
Ta:25℃
TEST： OK

</td></tr>
</table>

<table>
<tr>
<td>8</td>
<td>LED Status indicators</td>
<td colspan="3">※ LED Status Indicators
<table>
<tr><th>Description</th><th>Output of alarm</th></tr>
<tr><td>Normal operation</td><td>Green : Steadily lit</td></tr>
<tr><td>Remote off</td><td>Red : Steadily lit</td></tr>
<tr><td>Internal over-temperature</td><td>Orange : 1 Blink/Pause</td></tr>
<tr><td>Overload/Short</td><td>Red : 1 Blink/Pause</td></tr>
<tr><td>Over voltage</td><td>Red : 2 Blink/Pause</td></tr>
<tr><td>Over temperature</td><td>Red : 3 Blink/Pause</td></tr>
<tr><td>Fan fail</td><td>Red : 4 Blink/Pause</td></tr>
<tr><td>AC under voltage</td><td>Red : 5 Blink/Pause</td></tr>
<tr><td>Others (Note)</td><td>Red : 6 Blink/Pause</td></tr>
</table>
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℃
TEST : PASS</td>
</tr>
<tr>
<td>9</td>
<td>FAN NOISE (Typ.)</td>
<td>10% load @18 dB
70% load @24 dB

Built-in intelligent fan speed control detect by PSU’ S internal temperature</td>
<td>I/P：230 VAC
O/P：TESTING
Ta：25℃</td>
<td>10% load: 16.39dB
70% load: 21.05dB</td>
</tr>
</table>

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℃	VDS: (1) 445V (2) 461V (3) 445V (4) 445V (5) 437V (6) 441V (7) 465V (8) 30.1V (9) 55.2V VDS: (1) 461V (2) 477V (3) 465V (4) 469V (5) 453V (6) 457V (7) 485V
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) 485V (2) 465V (3) 461V (4) 461V (5) 465V (6) 453V (7) 465V

			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℃	VDS: (1) 597V (2) 630V (3) 610V (4) 626V (5) 632V (6) 610V (7) 610V
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℃	(1) 449V (2) 461V (3) 457V (4) 457V (1) 457V (2) 493V (3) 453V (4) 453V
4	Diode Peak Voltage	Q100 Rated: 370A/80V Q103 Rated: 370A/80V	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℃	Q100: VDS: (1) 57.7V (2) 57.3V (3) 60.2V (4) 58.1V (5) 57.3V (6) 60.2V (7) 57.3V (8) 59.3V

				Q103: VDS: (1) 58.5V (2) 58.1V (3) 62.6V (4) 58.5V (5) 58.1V (6) 61.8V (7) 58.1V (8) 58.9V
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℃	 (1)438V (2)434V (3)450V (4)438V
6	Control IC Voltage Test	PWM IC U500 Rated: 8V~30V PFC IC U1 Rated: 11.9V~25V O/P 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℃	 U500 (1) 19.2V (2) 20.4V (3) 20.4V (4) 19.4V (5) 19.6V U1 (1) 19.2V (2) 19.2V (3) 19.2V (4) 18.6V (5) 19.0V U100 (1) 12.51V (2) 12.67V (3) 12.51V (4) 12.67V (5) 12.67V
7	AUX POWER PWM Transistor	Q500 Rated : 7A/700V	AC ON/OFF I/P:High-Line +3V =308V O/P: (1)Full Load (2)Remote On/Off I/P:Low-Line -3V =82 V O/P: (1)Full Load (2)Remote On/Off Ta:25℃	 (1)569V (2)553V (1)565V (2)565V

■ 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℃	I/P-O/P: 3.505 mA I/P-FG: 2.39 mA O/P-FG: 2.36 m A NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500 VDC>100MΩ I/P-FG: 500 VDC>100MΩ O/P-FG: 500 VDC >100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25℃	I/P-O/P: >9999 MΩ I/P-FG: >9999 MΩ O/P-FG: >9999 MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	13 mΩ

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℃	PASS
2	CONDUCTION	EN55032 EN55014-1 EN55011	I/P： 230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab
3	RADIATION	EN55032 EN55014-1 EN55011	I/P： 230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	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℃	CRITERIA A
5	E.F.T	EN61000-4-4 INPUT： 2KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	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℃	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

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL : NSP-1000-12
1. ROOM AMBIENT BURN-IN : 2 HRS
I/P : 230VAC O/P : FULL LOAD Ta=27.4 ℃
2. HIGH AMBIENT BURN-IN : 2 HRS
I/P : 230VAC O/P : FULL LOAD Ta=62.8 ℃</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P : 230 VAC
O/P : 118 % LOAD
Ta : 25℃</td><td>TEST : OK</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P : 305VAC/100VAC
O/P : 60%/ 100 % LOAD
Ta= -45/-35 ℃</td><td>TEST : OK</td></tr>
</table>

NO	Position	ROOM AMBIENT Ta=27.4 ℃	HIGH AMBIENT Ta=62.8 ℃
1	LF2	35.3℃	70.7℃
2	BD1	56.7℃	92.1℃
3	Q1	53.9℃	89.3℃
4	D4	51.2℃	86.6℃
5	L1	42.6℃	78.0℃
6	C5	37.0℃	72.4℃
7	U1	42.8℃	78.2℃
8	U2	49.2℃	84.6℃
9	Q50	53.0℃	88.4℃
10	Q51	53.1℃	88.5℃
11	Q52	49.7℃	85.1℃
12	Q53	50.7℃	86.1℃
13	L3	77.5℃	112.9℃
14	T1	79.7℃	115.1℃
15	D100	72.2℃	107.6℃
16	L100	68.4℃	103.8℃
17	C110	61.5℃	96.9℃
18	U100	85.8℃	121.2℃
19	Q102	70.7℃	106.1℃
20	R118	82.2℃	117.6℃
21	RTH5	37.3℃	72.7℃
22	RTH6	44.0℃	79.4℃
23	RT31	55.9℃	91.3℃
24	RT32	46.8℃	82.2℃
25	C14	36.6℃	72.0℃

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60 ℃/95 %R.H NO DAMAGE	I/P：315 VAC O/P：FULL LOAD Ta= 65 ℃ HUMIDITY= 95 %R.H	TEST：OK
5	TEMPERATURE COEFFICIENT	±0.03 %/℃(0~60℃)	I/P： 230 VAC O/P：FULL LOAD	±0.0023 %/℃(0~60℃)
6	STORAGE TEMPERATURE TEST	-40~85℃	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / 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℃	1. Thermal shock Temperature： -35℃~ +65℃ 2. Temperature change rate ：25℃ / 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℃	
9	CAPACITOR LIFE CYCLE	SUPPOSE C110 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Ta=25 ℃ LIFE TIME (2) I/P： 230VAC O/P：FULL LOAD Ta=60 ℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta=60 ℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta=60 ℃ LIFE TIME		(1) 345915HRS (2) 17538HRS (3) 145871HRS (4) 244889HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 910.8K hrs min. Telcordia SR-332 (Bellcore) ; 87.5K hrs min. MIL-HDBK-217F (25℃)		
11	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=50℃ Demonstration Mean Time Between Failure : 50,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQIN/ZHOUBIAO	WENF	WUWQ

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