



Test Report: NSP-1000-12

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

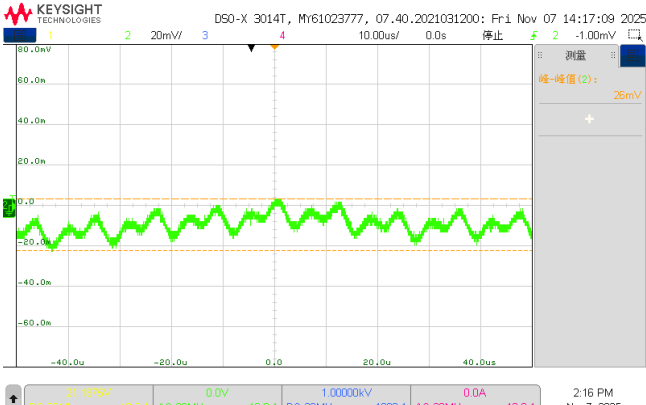
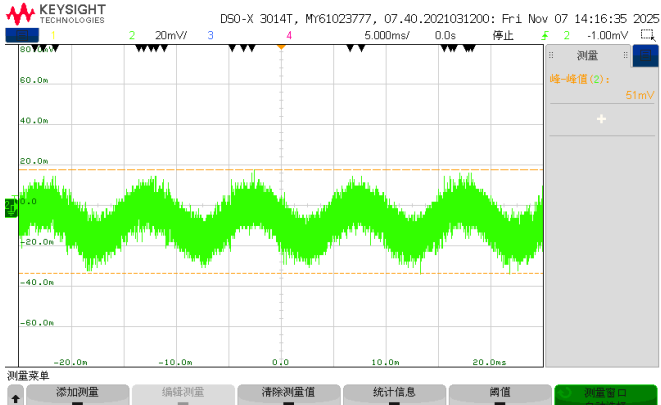
E.M.C. Test

■ RELIABILITY TEST

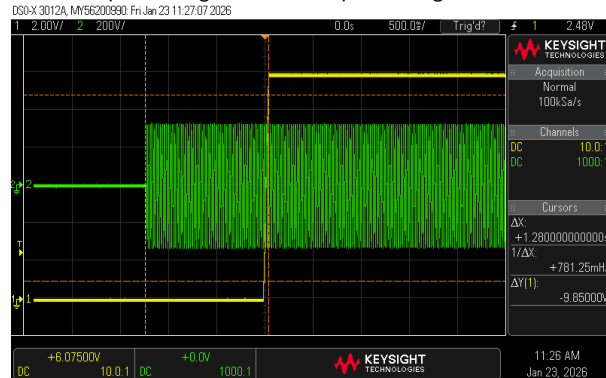
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

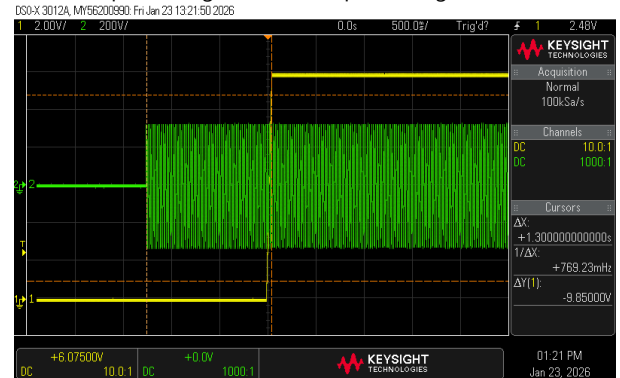
OUTPUT FUNCTION TEST

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

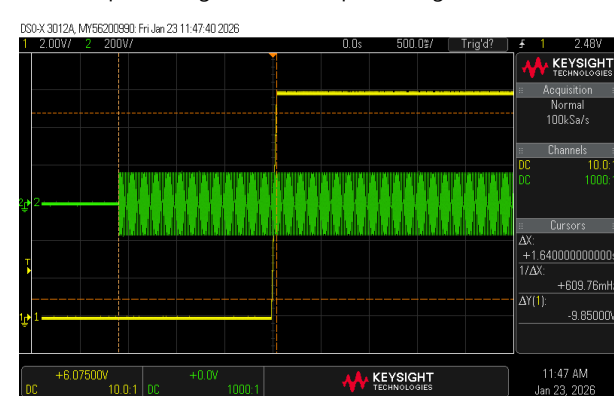
INPUT=277VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage



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



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



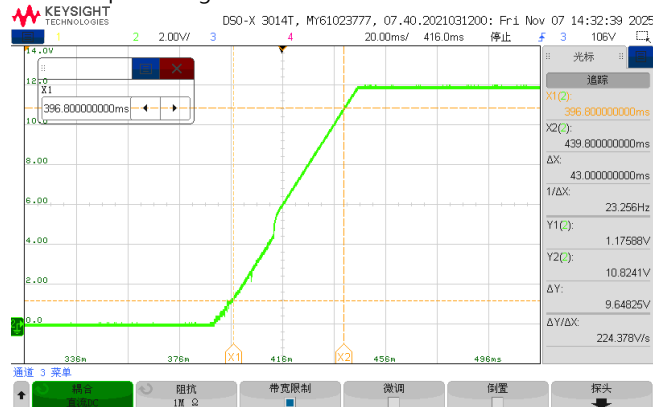
8 RISE TIME (Max)

277VAC/80ms
230VAC/80ms
115VAC/80ms

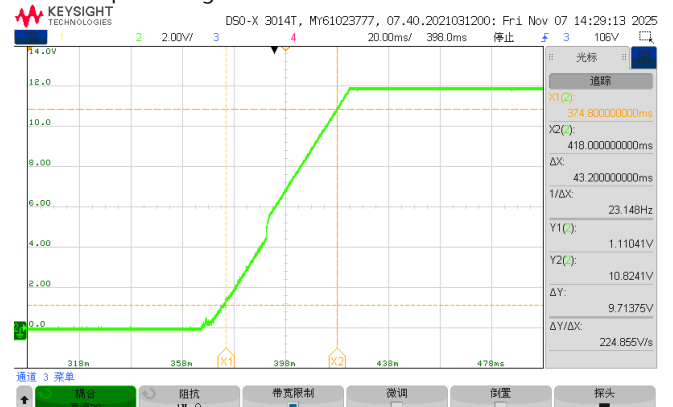
I/P : 277VAC
I/P : 230VAC
I/P : 115VAC
O/P : FULL LOAD
Ta : 25°C

277VAC/43ms
230VAC/43.2ms
115VAC/44.4ms

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

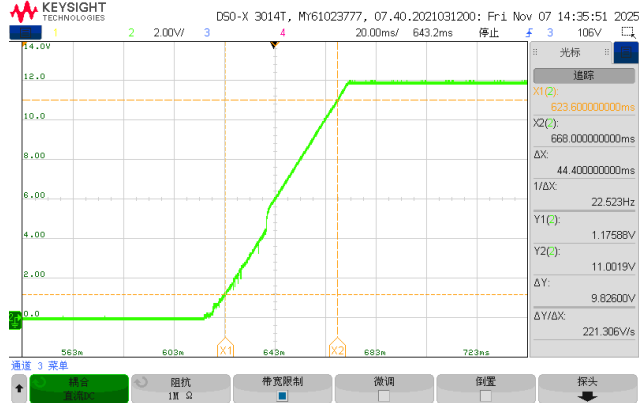


INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage



INPUT=115VAC/60HZ @ FULL LOAD

CH1 : Output Voltage



9

HOLD UP TIME (Typ.)

12ms@70%load
8ms@full load

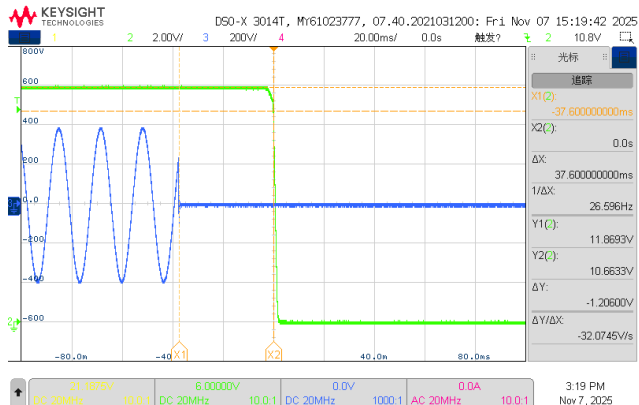
I/P : 277 VAC
I/P : 230VAC
I/P : 115 VAC
O/P : 70%LOAD/FULL LOAD
Ta : 25°C

FULL LOAD
277VAC: 26.4ms
230VAC: 27.2ms
115VAC: 26.2ms

70% LOAD
277VAC: 37.6ms
230VAC: 38.8ms
115VAC: 37.8ms

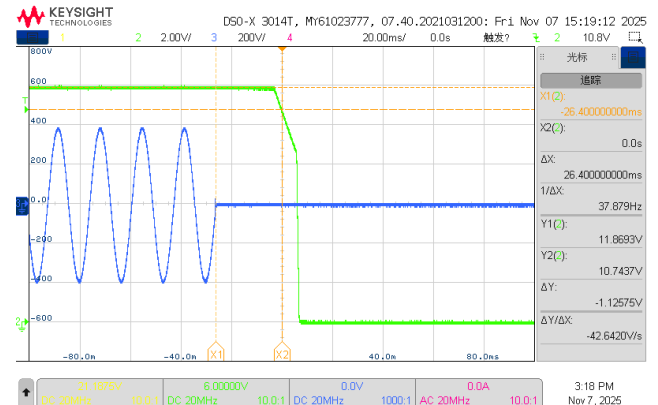
INPUT=277VAC/60HZ@70% LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



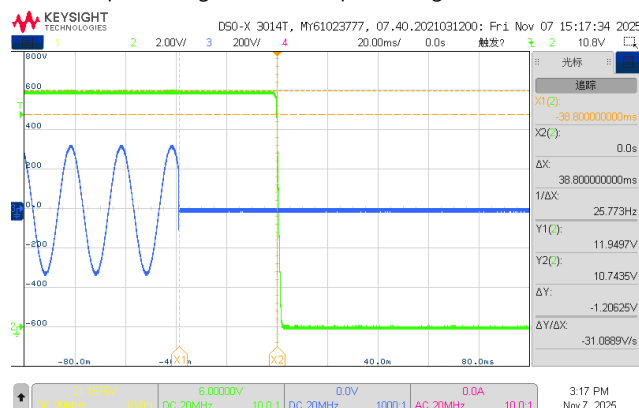
INPUT=277VAC/60HZ@FULL LOAD

CH1 : Output Voltage CH2 : AC Input Voltage



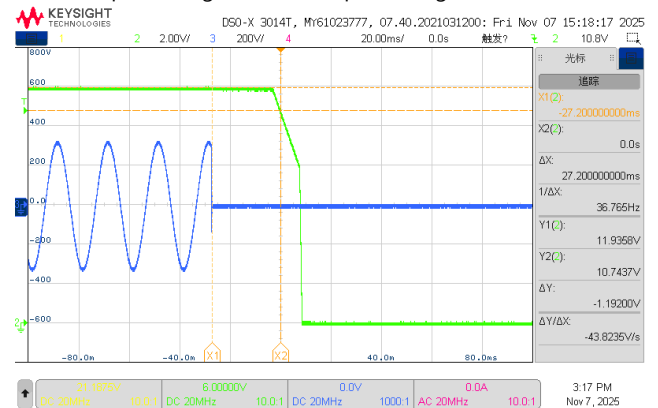
INPUT=230VAC/50HZ@70%LOAD

CH1 : Output Voltage CH2 : AC Input Voltage

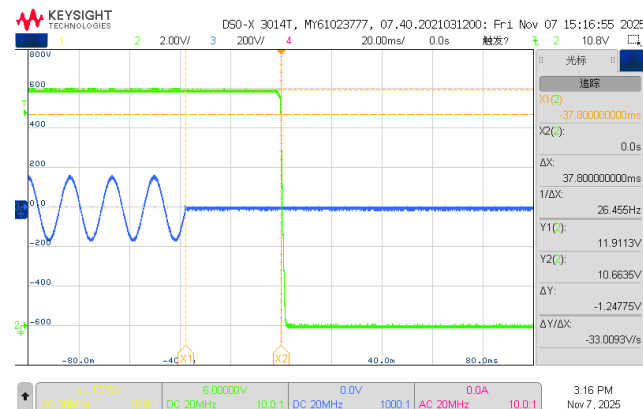


INPUT=230VAC/50HZ@FULL LOAD

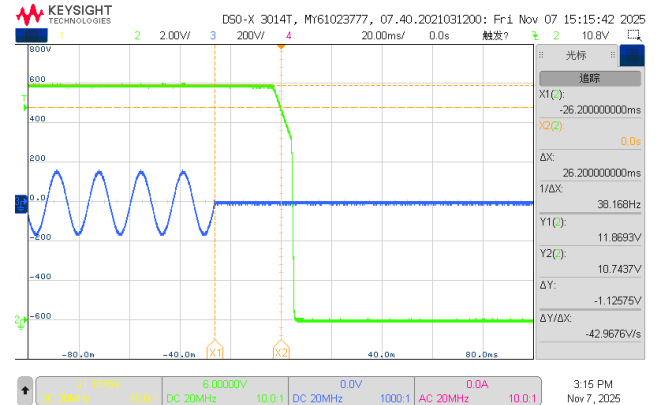
CH1 : Output Voltage CH2 : AC Input Voltage



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: 2400mVp-p

I/P: 230VAC

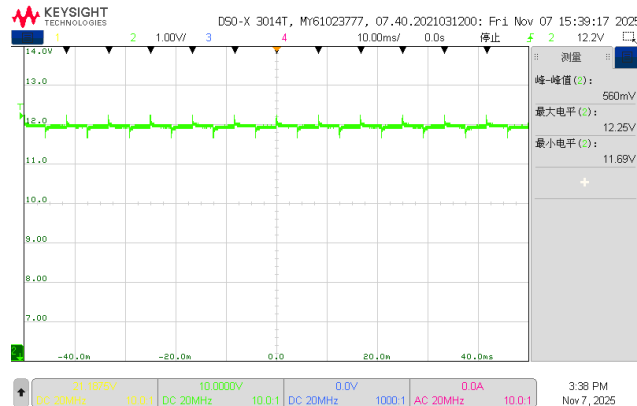
O/P:

(1)FULL /50% LOAD 50%DUTY / 120HZ
(2)FULL /50% LOAD 50%DUTY / 1KHZ
Ta:25°C

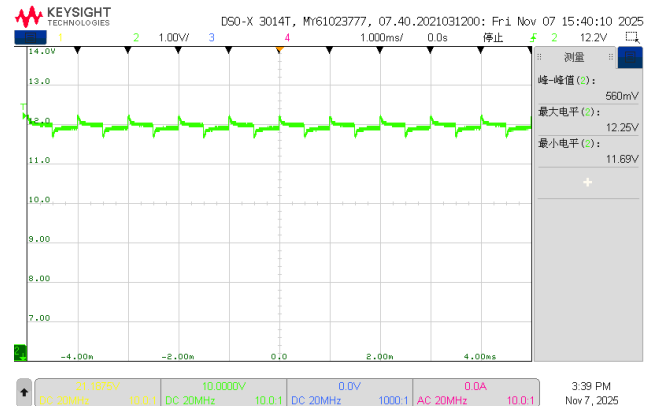
560mVp-p

560mVp-p

FULL /50% LOAD 50%DUTY / 120HZ



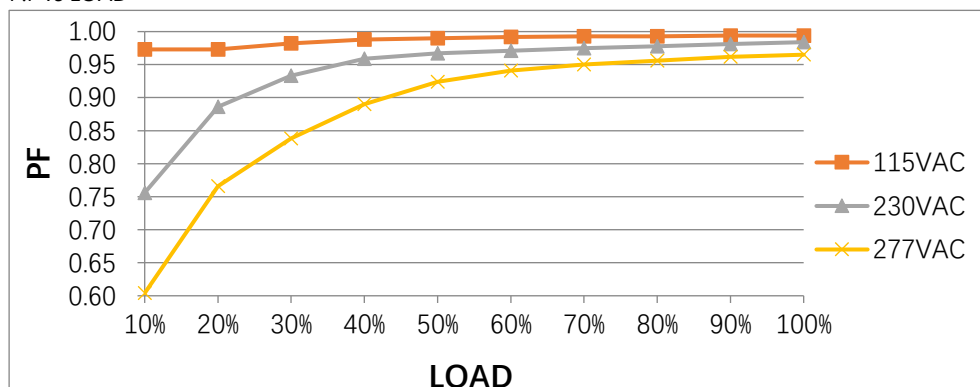
FULL /50% LOAD 50%DUTY / 1KHZ

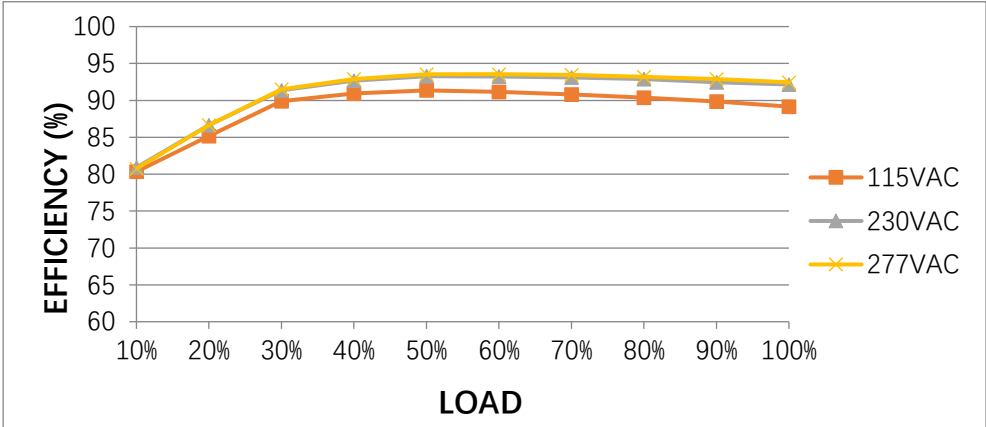
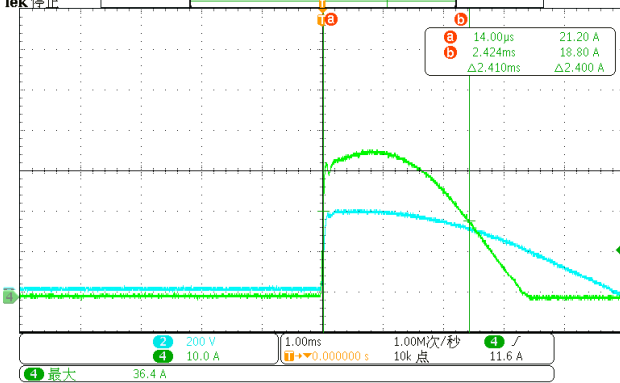
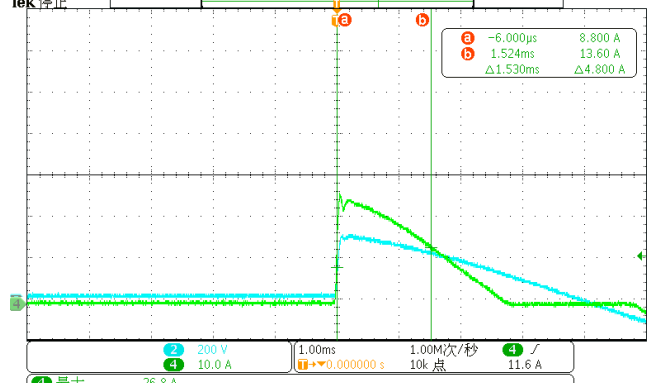
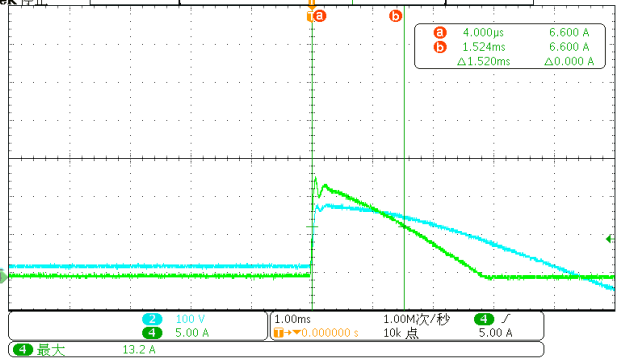


INPUT FUNCTION TEST

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 ~305 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 =4.04A/ 277VAC I =4.8A/ 230VAC I =9.79A/ 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 : 222.8 μ A N-FG : 221.6 μ A
		Touch current <100 μ A (rms)@277 VAC		L-V+: 77.4 μ A L-V-: 76.2 μ A N-V+:77.4 μ A N-V-:76.4 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

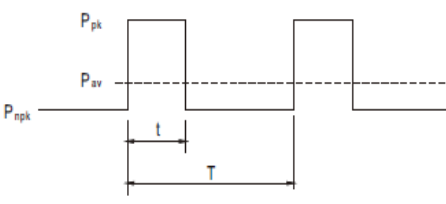


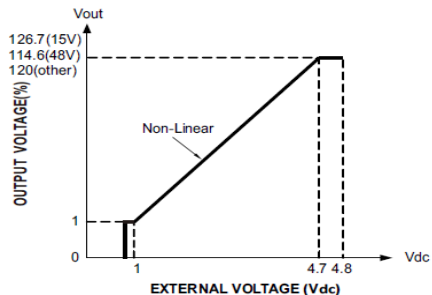
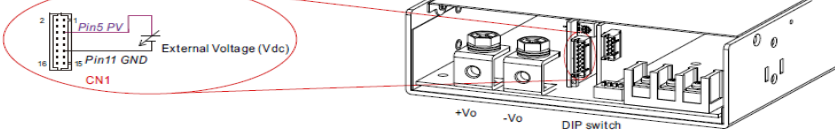
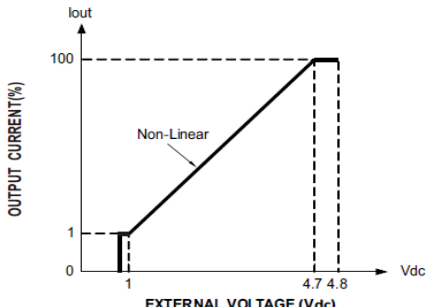
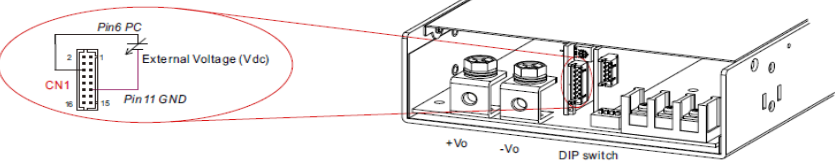
6	EFFICIENCY(Typ.)	92%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	92.17%
EFFICIENCY vs LOAD 				
7	INRUSH CURRENT(Typ.)	50A/277VAC 40A/230VAC 25A/115VAC COLD START	I/P : 277VAC I/P : 230VAC I/P : 115VAC O/P : FULL LOAD Ta : 25°C	I =36.4A/ 277VAC T50= 2410us/277V I =26.8A/230VAC T50= 1530 us/230V I =13.2A/ 115VAC 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°C	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°C	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°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_{npgk}: 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% $P_{av}=P_{rated}=1000W$ $P_{pk}=2000W$ $t \leq 5sec$ $T \geq \frac{5sec}{5\%} = 100sec$ $P_{npgk} \leq \frac{TP_{av}-tP_{pk}}{T-t} = 947.4W$ 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.  I/P: 230 VAC O/P:FULL LOAD Ta:25°C TEST RESULT : <table><tr><td>External voltage(DC)</td><td><0.4V</td><td>1V</td><td>2.524V</td><td>4.7V</td><td>4.8V</td></tr><tr><td>SPEC(%)</td><td>0%</td><td>0%~6%</td><td>50%±5%</td><td>120%±5%</td><td>120%±5%</td></tr><tr><td>Vout(%)</td><td>0%</td><td>0.115V(0.96%)</td><td>5.84V(48.67%)</td><td>14.18V(118.17%)</td><td>14.57V(121.42%)</td></tr></table>	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%)
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°C <table><tr><td>External voltage(DC)</td><td><0.4V</td><td>1V</td><td>2.831V</td><td>4.7V</td><td>4.8V</td></tr><tr><td>SPEC(%)</td><td>0%</td><td>0%~6%</td><td>50%±5%</td><td>100%±5%</td><td>100%±5%</td></tr><tr><td>Iout(%)</td><td>0%</td><td>2.22%</td><td>50.06%</td><td>101.17%</td><td>102.85%</td></tr></table>	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%
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%															

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. Pin2 +5V-AUX switch Pin1 R.C CN2 +Vo -Vo <table><tr><td>PSU Vo Status</td><td>Between +5V-AUX(Pin 2) and R.C(Pin 1)</td></tr><tr><td>Power ON</td><td>Switch Short</td></tr><tr><td>Power OFF</td><td>Switch Open</td></tr></table> R.C 5V-AUX User's Optocoupler User's power Relay User's PSU 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><tr><td>Between +5V-AUX(Pin2)) and R.C(Pin1)</td><td>Power Supply Status</td></tr><tr><td>SW SHORT</td><td>Power on</td></tr><tr><td>SW OPEN</td><td>Power off</td></tr></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	Power on	SW OPEN	Power 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	Power on															
SW OPEN	Power 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	>0.52V												
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 0.2A. 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°C Test Result :<table><tr><td>AUX</td><td>TOLERANCE</td><td>RIPPLE</td><td>TEST RESULT</td></tr><tr><td>12V / 0.8A</td><td>10.2~13.8V</td><td>450mVp-p</td><td>11.91V/42mV</td></tr><tr><td>5V / 0.2A</td><td>4.25~5.75V</td><td>150mVp-p</td><td>4.70V/34mV</td></tr></table>			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
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													
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: 21.05dB

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) 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°C	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°C	(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°C	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°C	(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°C	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°C	(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°C	I/P-O/P: 3.505 mA I/P-FG: 2.39 mA O/P-FG: 2.36 mA 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°C	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°C	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°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-1000-12 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=27.4 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=62.8 °C <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=27.4 °C</th><th>HIGH AMBIENT Ta=62.8 °C</th></tr><tr><td>1</td><td>LF2</td><td>35.3°C</td><td>70.7°C</td></tr><tr><td>2</td><td>BD1</td><td>56.7°C</td><td>92.1°C</td></tr><tr><td>3</td><td>Q1</td><td>53.9°C</td><td>89.3°C</td></tr><tr><td>4</td><td>D4</td><td>51.2°C</td><td>86.6°C</td></tr><tr><td>5</td><td>L1</td><td>42.6°C</td><td>78.0°C</td></tr><tr><td>6</td><td>C5</td><td>37.0°C</td><td>72.4°C</td></tr><tr><td>7</td><td>U1</td><td>42.8°C</td><td>78.2°C</td></tr><tr><td>8</td><td>U2</td><td>49.2°C</td><td>84.6°C</td></tr><tr><td>9</td><td>Q50</td><td>53.0°C</td><td>88.4°C</td></tr><tr><td>10</td><td>Q51</td><td>53.1°C</td><td>88.5°C</td></tr><tr><td>11</td><td>Q52</td><td>49.7°C</td><td>85.1°C</td></tr><tr><td>12</td><td>Q53</td><td>50.7°C</td><td>86.1°C</td></tr><tr><td>13</td><td>L3</td><td>77.5°C</td><td>112.9°C</td></tr><tr><td>14</td><td>T1</td><td>79.7°C</td><td>115.1°C</td></tr><tr><td>15</td><td>D100</td><td>72.2°C</td><td>107.6°C</td></tr><tr><td>16</td><td>L100</td><td>68.4°C</td><td>103.8°C</td></tr><tr><td>17</td><td>C110</td><td>61.5°C</td><td>96.9°C</td></tr><tr><td>18</td><td>U100</td><td>85.8°C</td><td>121.2°C</td></tr><tr><td>19</td><td>Q102</td><td>70.7°C</td><td>106.1°C</td></tr><tr><td>20</td><td>R118</td><td>82.2°C</td><td>117.6°C</td></tr><tr><td>21</td><td>RTH5</td><td>37.3°C</td><td>72.7°C</td></tr><tr><td>22</td><td>RTH6</td><td>44.0°C</td><td>79.4°C</td></tr><tr><td>23</td><td>RT31</td><td>55.9°C</td><td>91.3°C</td></tr><tr><td>24</td><td>RT32</td><td>46.8°C</td><td>82.2°C</td></tr><tr><td>25</td><td>C14</td><td>36.6°C</td><td>72.0°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta=27.4 °C	HIGH AMBIENT Ta=62.8 °C	1	LF2	35.3°C	70.7°C	2	BD1	56.7°C	92.1°C	3	Q1	53.9°C	89.3°C	4	D4	51.2°C	86.6°C	5	L1	42.6°C	78.0°C	6	C5	37.0°C	72.4°C	7	U1	42.8°C	78.2°C	8	U2	49.2°C	84.6°C	9	Q50	53.0°C	88.4°C	10	Q51	53.1°C	88.5°C	11	Q52	49.7°C	85.1°C	12	Q53	50.7°C	86.1°C	13	L3	77.5°C	112.9°C	14	T1	79.7°C	115.1°C	15	D100	72.2°C	107.6°C	16	L100	68.4°C	103.8°C	17	C110	61.5°C	96.9°C	18	U100	85.8°C	121.2°C	19	Q102	70.7°C	106.1°C	20	R118	82.2°C	117.6°C	21	RTH5	37.3°C	72.7°C	22	RTH6	44.0°C	79.4°C	23	RT31	55.9°C	91.3°C	24	RT32	46.8°C	82.2°C	25	C14	36.6°C	72.0°C
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 118%LOAD Ta : 25°C	TEST : OK																																																																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 305VAC/100VAC 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	±0.0023 %/°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) 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°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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