Test Report: NSP-500-48

500W AC/DC High Reliable Multi-Industries 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

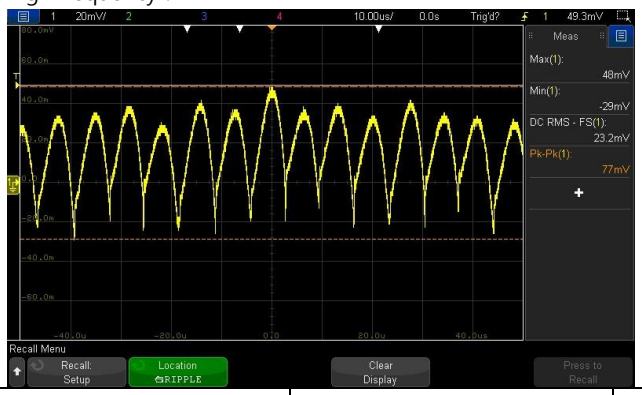
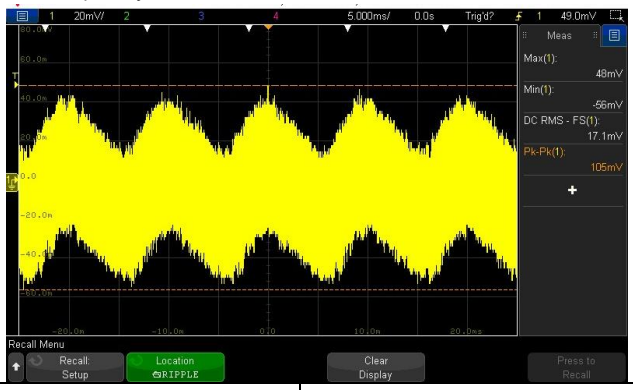
Safety Test
E.M.C. Test

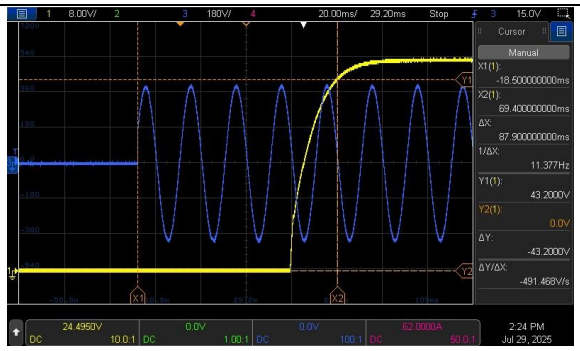
■ RELIABILITY TEST

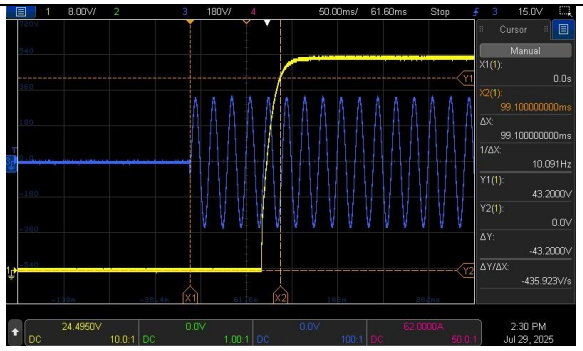
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

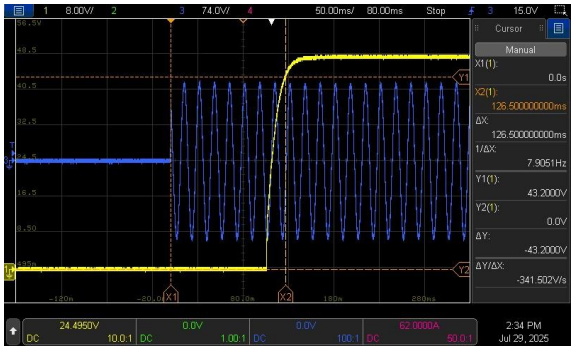
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 44V~57V	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	42.87V~58.48V/277VAC 42.86V~58.49V/230VAC 42.87V~58.48V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	V1: -1% ~ +1%	I/P: 85VAC~305VAC O/P:FULL~MIN. LOAD Ta:25℃	V1: -0.0063% ~0.0063%
3	LINE REGULATION	V1: -0.5% ~ +0.5%	I/P: 85VAC~ 305VAC O/P:FULL LOAD Ta:25℃	V1: -0.0022% ~0.0063%
4	LOAD REGULATION	V1: -0.5% ~ +0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.0063% ~ 0.0022%
5	OVER/UNDERSHOOT TEST	<± 5%	I/P: 230VAC O/P:FULL LOAD / NO LOAD Ta:25℃	1.3%
6	RIPPLE & NOISE (Max)	V1: 240mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	77mVp-p / high frequency 105mVp-p / low frequency
	high frequency：  low frequency： 			
7	SET UP TIME(Max)	277VAC/900ms 230VAC/1000ms 115VAC/1500ms	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	277VAC/87.9ms 230VAC/99.1ms 115VAC/126.5ms
	INPUT=277VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage		INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage	



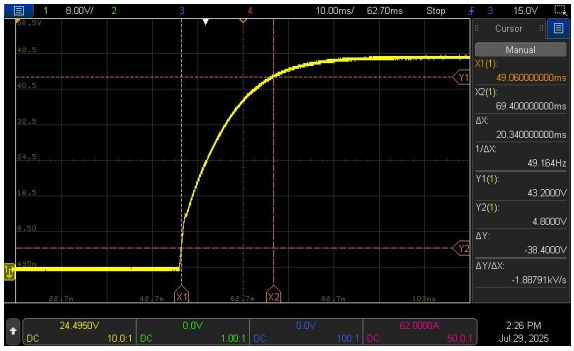


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage



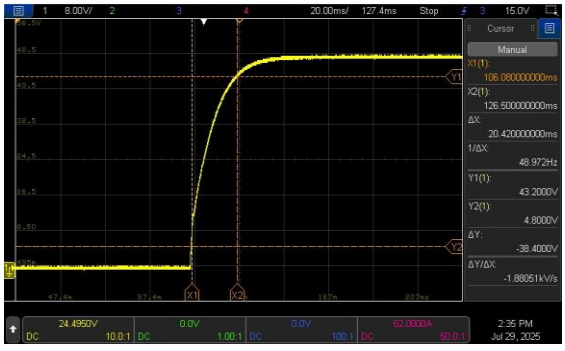
8	RISE TIME (Max)	277VAC/80ms 230VAC/80ms 115VAC/80ms	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	277VAC/20.34ms 230VAC/20.29ms 115VAC/20.42ms

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



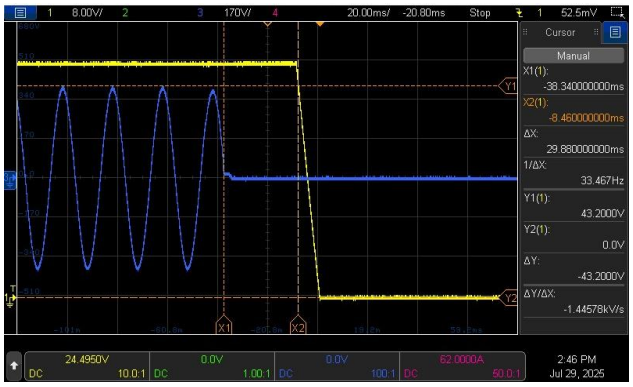
INPUT=230VAC/50HZ @ FULL LOAD
CH1: Output Voltage

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

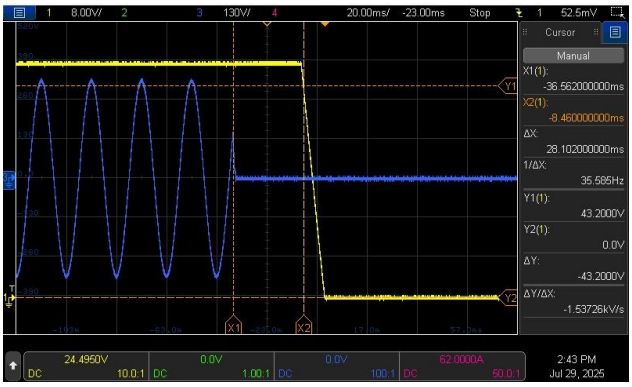


9	HOLD UP TIME (Typ.)	277VAC/16ms 230VAC/16ms 115VAC/16ms	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	277VAC/29.67ms 230VAC/28.102ms 115VAC/29.88ms

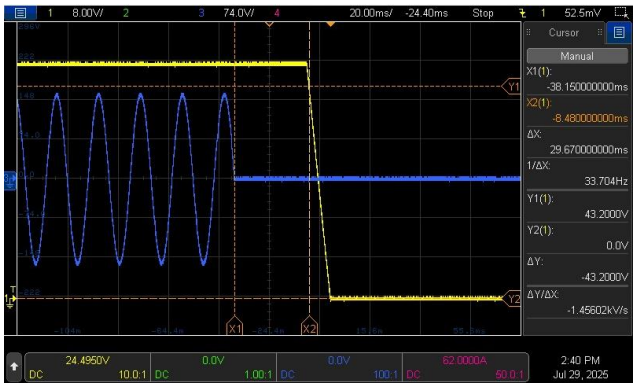
INPUT=277VAC/50HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage



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

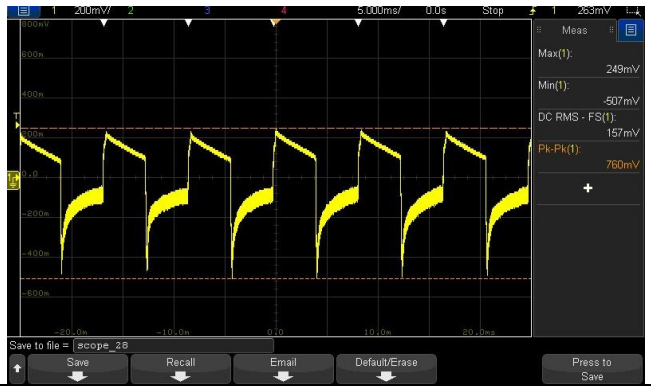


INPUT=115VAC/60HZ @ FULL LOAD
CH1: Output Voltage CH3: AC Input Voltage

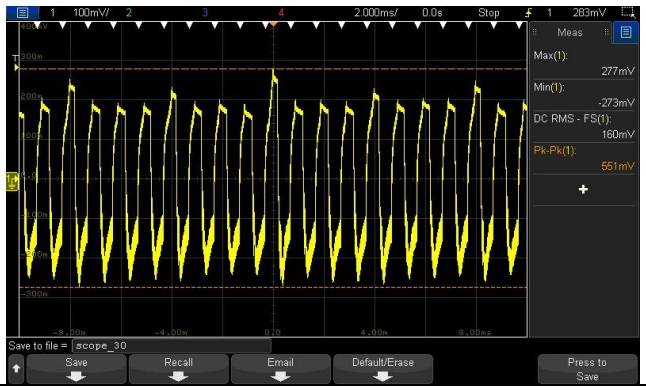


10	DYNAMIC LOAD	V1: 4800mVp-p	I/P: 230VAC O/P: (1) FULL/ MIN LOAD 50%DUTY / 120HZ (2) FULL/ MIN LOAD 50%DUTY / 1KHZ Ta:25℃	760mVp-p 551mVp-p

FULL / MIN LOAD 50%DUTY / 120HZ

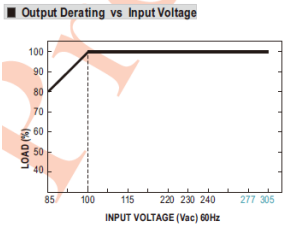


FULL / MIN LOAD 50%DUTY / 1KHZ

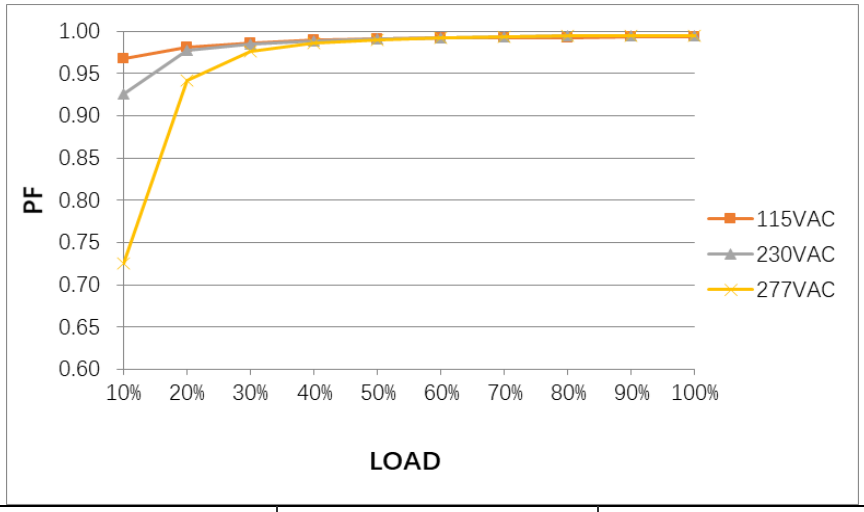


11	TRANSIENT RECOVERY TIME	V1: 4800mVp-p <500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	273mVp-p

INPUT FUNCTION TEST

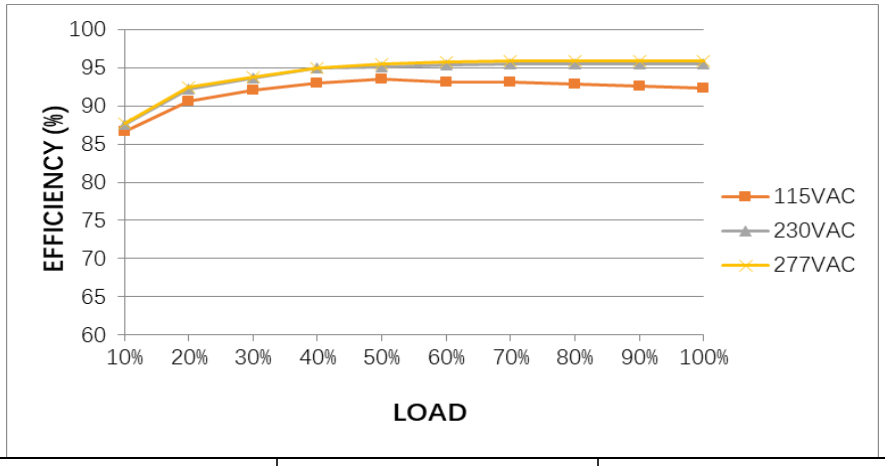
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	85VAC~305VAC 120VDC~ 431VDC 	(1) I/P: TESTING O/P: FULL / 80% LOAD (2) I/P: DC TESTING (L: + N: -) O/P: FULL / 80% LOAD (3) I/P: DC TESTING (L: - N: +) O/P: FULL / 80% LOAD Ta:25℃	(1) 76.4V~305V/ FULL LOAD 76.0V~305V/ 80% LOAD (2) 105Vdc~431Vdc/FULL LOAD 105Vdc~431Vdc/80% LOAD (3) 105Vdc~431Vdc/FULL LOAD 105Vdc~431Vdc/80% LOAD
			I/P: HIGH-LINE+10V=315V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 85VAC~ 305VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK
3	INPUT CURRENT (Typ.)	277V/ 2.2A 230V/ 2.6A 115V/ 5.3A	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =1.9177A/ 277VAC I =2.326A/ 230VAC I =4.8855A/ 115VAC
4	LEAKAGE CURRENT	Earth leakage current < 350uA(rms)@277Vac Touch current < 100uA(rms)@277Vac	I/P： 277 VAC/60HZ O/P：Min LOAD Ta：25℃	292.9uA for Earth 26.8uA for Touch
5	NO LOAD CONSUMPTION	Remote Power OFF: 0.75W/115Vac 0.75W/230Vac 0.75W/277Vac Remote Power ON: 3.3W/115Vac 3W/230Vac 3W/277Vac	I/P：115VAC I/P：230VAC I/P：277VAC O/P：NO LOAD Ta：25℃	TEST： Remote Power OFF / Remote Power ON 115VAC 0.405W 2.566W 230VAC 0.551W 2.185W 277VAC 0.541W 2.111W
6	POWER FACTOR (Typ.)	0.9/ 277VAC 0.93/ 230VAC 0.98/115VAC	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	PF=0.9953/277VAC PF=0.995/230VAC PF=0.9926/115VAC

P.F vs LOAD



7	EFFICIENCY(Typ.)	95%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	95.2%

EFFICIENCY vs LOAD



8	INRUSH CURRENT(Typ.)	277V/50A 230V/40A 115V/20A COLD START	I/P： 277 VAC I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =36.9A/ 277VAC I =28.6A/ 230VAC I =12.8A/ 115VAC T50= 1862.2us/230V

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/ 60HZ @ FULL LOAD
CH2: AC Input Voltage CH4: Input current

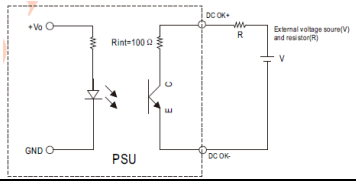
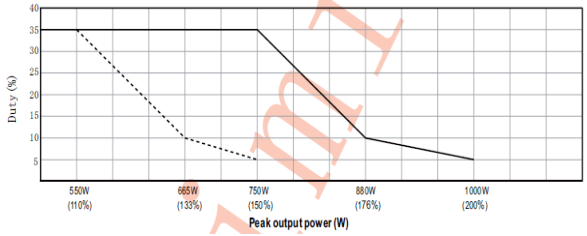
T50@230VAC:

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	Protection type: Normally works within 105 ~ 200% rated output power for more than 5 seconds and then constant current limiting without shutdown(Vout>30%), recovers automatically after fault condition is removed, or shut down o/p voltage when Vout<30%, AC re-power on to recover. Protection type: >200%(150%@100VAC) rated power, constant current limiting (Vout>30%)with auto-recovery after fault condition is removed, or shut down o/p voltage when Vout<30%,AC re-power on to recover.	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P:TESTING Ta:25℃	TEST : 142.87%/305VAC, 143.24%230VAC, 143.52%/100VAC, Protection type: Normally works within 105 ~ 200% rated output power for more than 5 seconds and then constant current limiting without shutdown(Vout>30%), recovers automatically after fault condition is removed, or shut down o/p voltage when Vout<30%, AC re-power on to recover. 228.79 %/305VAC 228.79 %/230VAC 193.33 %/100VAC Protection type: constant current limiting (Vout>30%)with auto-recovery after fault condition is removed,or shut down o/p voltage when Vout<30%,AC re-power on to recover.
2	OVER VOLTAGE PROTECTION	58V~ 70V Protection type: Shut down o/p voltage, AC re-power on to recover	I/P: 305VAC I/P: 85VAC O/P:MIN LOAD Ta:25℃	63.6V/ 305VAC 63.8V/ 85VAC PROTECTION TYPE : Shut down o/p voltage, AC re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection type: Shut down o/p voltage, AC re-power on to recover	I/P: 305VAC I/P: 85VAC O/P:FULL LOAD	TEST: OK O.T.P. Active Protection type : Shut down o/p voltage, AC re-power on to recover

4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Protection type: Constant current limiting for more than 5 seconds (Vout<30%) and then shut down o/p voltage, AC re-power on to recover	I/P: 305VAC I/P: 85VAC O/P:FULL LOAD	NO DAMAGE PROTECTION TYPE : Constant current limiting for more than 5 seconds (Vout<30%) and then shut down o/p voltage, AC re-power on to recover or Hiccup mode ,recovery automatically after fault conditon is removed. Depends on the user's wire impedance

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	REMOTE CONTROL	Power ON: RC+~RC- : 0~0.8Vdc or open Power OFF: RC+~RC- : 3.3~10Vdc	I/P:230VAC O/P:FULL LOAD Ta:25℃	TEST: OK
2	REMOTE SENSE	S+ / S- The remote sensing compensates voltage drop on the load wiring up to 0.3V	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: OK
3	DC OK SIGNAL	15Vdc/10mA resistive load 	I/P:230VAC O/P:FULL LOAD Ta:25℃	TEST: OK
4	FAN CONTROL	(1)Fan ON/OFF control: RTH4≥ 50℃±10℃ FAN ON RTH4≤ 40℃±10℃ FAN OFF (2)Fan＆NOISE:＜45dB	I/P:230VAC O/P:TESTING	TEST: (1) OK (2) 44.8 dB Ta:25℃
5	PEAK Power	I/P: 100/305VAC O/P:  ------100VAC ———200VAC		TEST: OK

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q2/Q3 : Rated: 24A/650V	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) Peak Load Ta:25℃	Q2 Q3 VDS: VDS: (1) 526V (1) 514V (2) 530V (2) 526V (3) 526V (3) 522V (4) 530V (4) 522V (5) 526V (5) 522V (6) 526V (6) 514V (7) 530V (7) 522V (8) 522V (8) 522V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 : Rated: 34A/600V	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) Peak Load Ta:25℃	Q1 VDS: (1) 462V (2) 486V (3) 462V (4) 458V (5) 462V (6) 462V (7) 458V (8) 490V
3	P.F.C DIODE	D5 : Rated: 10A/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 (5) Peak Load Ta:25℃	(1) 453V (2) 469V (3) 453V (4) 445V (5) 465V
4	Diode Peak Voltage	Q100/Q104 : Rated: 76A/150V	AC ON/OFF I/P: High-Line +3V =308 V VO=Vomax	Q101: Q104: VO=Vomax VO=Vomax VDS: 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).NO LOAD (9) Peak Load VO=Vnormal O/P: (1) Full Load Ta:25℃	(1) 133.6V (2) 133.6V (3) 133.6V (4) 133.6V (5) 133.6V (6) 131V (7) 127V (8) 133.6V (9) 129V VO=Vnormal (1) 120.4V	(1) 132.7V (2) 131.9V (3) 132.7V (4) 132.7V (5) 132.7V (6) 134.5V (7) 127V (8) 131.9V (9) 128V VO=Vnormal (1) 118.6V
5	Input Capacitor Voltage	C5： Rated: 100 μ /450V	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 (5) Peak Load on/off (6) Peak Load continue Ta:25℃	(1) 450V (2) 438V (3) 434V (4) 434V (5) 454V (6) 454V	
6	Control IC Voltage Test	PFC/PWM IC U1： Rated：12.5V~ 27.9V IC U2： Rated：4.5V~18V O/P IC U101： Rated：4.75V~38V IC U103： Rated：3~30 V IC U104： Rated：3V ~30V	AC ON/OFF I/P: High-Line +3V =308V O/P: (1) Full Load (2) Output Short (3) O.L.P (4) O.V.P. (5) No Load VR min (Low Line) Ta:25℃	U1/U2 (1) 13.9V (2) 14.4V (3) 14.5V (4) 14.0V (5) 14.0V U101 (1) 15.5V (2) 15.4V (3) 15.4V (4) 15.2V (5) 15.5V U103/U104 (1) 13.0V (2) 13.0V (3) 13.0V (4) 12.8V (5) 12.8V	

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4.2 K VAC/min I/P-FG : 2.1 K VAC/min O/P-FG: 1.5 KVAC/min	I/P-O/P: 4.62 KVAC/min I/P-FG: 2.52 KVAC/min O/P-FG: 1.8 KVAC/min Ta:25℃	I/P-O/P: 2.33 mA I/P-FG: 3.32 mA O/P-FG: 1.669 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: 600 VDC I/P-FG: 600 VDC O/P-FG: 600 VDC Ta:25℃	I/P-O/P: 41276 MΩ I/P-FG: 3738 MΩ O/P-FG: 15420 MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	4mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	BS EN/EN61000-3-2 （IEC61000-3-2） ■ CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25℃	■ PASS □ FAIL
2	CONDUCTION	BS EN/EN55032(CISPR32), CNS 15936 CLASS B BS EN/EN55011（CISPR11） CLASS B	I/P：230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab
3	RADIATION	BS EN/EN55032(CISPR32), CNS 15936 CLASS B BS EN/EN55011（CISPR11） CLASS B	I/P：230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab
4	E.S.D	BS EN/EN61000-4-2 AIR：15KV / Contact：8KV	I/P：230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
5	E.F.T	BS EN/EN61000-4-4 INPUT： 2KV	I/P：230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
6	SURGE	BS EN/EN 61000-4-5 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

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL： NSP-500-24 1. ROOM AMBIENT BURN-IN：2 HRS I/P： 230VAC O/P： FULL LOAD Ta= 26.5℃ 2. HIGH AMBIENT BURN-IN：2 HRS I/P： 230VAC O/P： FULL LOAD Ta= 60.1 ℃		

NO	Position	ROOM AMBIENT Ta=26.5℃	HIGH AMBIENT Ta=60.1℃
1	ZNR1	32.6℃	65.7℃
2	LF1	34.9℃	67.1℃
3	LF2	37.8℃	69.7℃
4	C2	36.1℃	68.8℃
5	LF3	42.6℃	75.0℃
6	RTH1	41.5℃	71.8℃
7	BD1	53.9℃	86.9℃
8	C8	47.3℃	77.0℃
9	Q1	55.9℃	86.7℃
10	RY1	52.9℃	80.6℃
11	C109	44.3℃	75.4℃
12	C116	41.0℃	72.1℃
13	C108	43.6℃	75.3℃
14	U103	38.5℃	71.4℃
15	RTH5	48.4℃	78.8℃
16	L3	52.8℃	77.3℃
17	C42	44.1℃	74.8℃
18	C7	43.8℃	73.3℃
19	C45	44.1℃	74.9℃
20	D5	53.7℃	85.2℃
21	VR1	36.4℃	68.2℃
22	C180	35.3℃	66.4℃
23	U104	36.9℃	67.6℃
24	T2	39.0℃	72.4℃
25	U6	58.7℃	83.3℃
26	U1	54.1℃	84.3℃
27	C92	45.1℃	78.3℃
28	Q2	49.1℃	82.7℃
29	C6	43.6℃	74.4℃
30	Q3	48.6℃	81.7℃
31	T1coil	64.0℃	95.5℃
32	T1core	54.3℃	85.6℃

NO	Position	ROOM AMBIENT Ta=26.5 ℃	HIGH AMBIENT Ta=60.1℃
33	D6	46.2℃	76.3℃
34	Q102	48.6℃	81.2℃
35	U101	50.5℃	81.5℃
36	Q104	48.2℃	81.2℃
37	U5	47.8℃	80.0℃
38	R5	46.4℃	78.6℃
39	J102	47.6℃	79.7℃
40	RTH4	45.2℃	76.7℃
41	D108	38.3℃	70.3℃
42	D101	43.0℃	70.2℃
43	D30	48.1℃	75.9℃
44	RTH3	38.7℃	67.4℃

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 230 VAC O/P：126%LOAD Ta：25℃	TEST：OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 305VAC/100VAC O/P： 80%/100%LOAD Ta= -45℃/-35℃	TEST：OK
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= 60℃ HUMIDITY= 95 %R.H	TEST：OK
5	TEMPERATURE COEFFICIENT	± 0.05%/℃(0~60℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.006%/℃(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 Carton & 1 Set (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 C109 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) 1024704.7HRS (2) 107708.8HRS (3) 150198.4HRS (4) 198847.5HRS

10	MTBF	Conducted by Parts Stress Analysis Prediction 1213.4K hrs min. Telcordia SR-332 (Bellcore) ; 212.1K 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	Yuwei	Liutt	Wangzd

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