



Test Report:RSP-500-12

500W Single Output Switching 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	VERDICT
1	RIPPLE & NOISE	V1 : 150 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 55 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 10 V ~ 13.2 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	9.35 V ~ 13.65 V/ 230 VAC 9.35 V ~ 13.65 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : -1 % ~ +1 % (Max)	I/P : 100 VAC / 264 VAC O/P : FULL / MIN LOAD Ta : 25°C	V1 : 0 % ~ 0.04 %	P
4	LINE REGULATION	V1 : -0.3 % ~ +0.3 % (Max)	I/P : 100 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 % ~ 0.04 %	P
5	LOAD REGULATION	V1 : -0.5 % ~ +0.5 % (Max)	I/P : 230 VAC O/P : FULL ~ MIN LOAD Ta : 25°C	V1 : 0 % ~ 0 %	P
6	SET UP TIME	230VAC : 1500 ms (Max) 115VAC : 3000 ms (Max)	I/P : 230 VAC/115VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 695 ms 115VAC/ 2223 ms	P
7	RISE TIME	230VAC : 80 ms (Max) 115VAC : 80 ms (Max)	I/P : 230 VAC/115VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 23.9 ms 115VAC/ 24.3 ms	P
8	HOLD UP TIME	230VAC : 18 ms (Max) 115VAC : 14 ms (Max)	I/P : 230 VAC/115VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 26.7 ms 115VAC/ 20.8 ms	P
9	OVER/UNDERSHOOT TEST	< +5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5 %	P
10	DYNAMIC LOAD	V1 : 1200 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 90%DUTY/ 3KHZ (3).O/P : FULL /Min LOAD 90%DUTY/ 5KHZ (4).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1) 486 mVp-p (2) 312 mVp-p (3) 300 mVp-p (4) 802 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C I/P : LOW-LINE-3V= 82 V HIGH-LINE+15%=300 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	63 V~264V TEST : OK	P
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 85 VAC ~ 264 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK	P
3	POWER FACTOR	0.95 / 230 VAC(TYP) 0.98 / 115 VAC(TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.971 / 230 VAC PF= 0.991 / 115 VAC	P
4	EFFICIENCY	89 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	89.32 %	P
5	INPUT CURRENT	230V/ 2.65 A (TYP) 115V/ 5.3 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 2.58 A/ 230 VAC I = 5.31 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 40 A (TYP) 115V/ 20 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 34.9 A/ 230VAC I = 14.6 A/115VAC	P
7	LEAKAGE CURRENT	< 2 mA / 240VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.68 mA N-FG : 0.68 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~130 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	107.8 %/230VAC 110.5 %/115VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 13.8 V ~ 16.2 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	14.53 V/230VAC 14.52 V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : Shut down o/p voltage , recovers automatically after temperature goes down	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Constant Current Limiting	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE CONTROL	CN100 POWER ON : < 0~0.8V POWER OFF : 4~10V	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	POWER ON : 0~1.1 V POWER OFF : 1.2~10 V	P
2	FAN ON/OFF CONTROL	RTH2 $\geq 50^{\circ}\text{C} \pm 10^{\circ}\text{C}$ FAN ON RTH2 $\leq 40^{\circ}\text{C} \pm 10^{\circ}\text{C}$ FAN OFF	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	FAN ON: 45.3 °C FAN OFF: 39.8 °C	P
3	REMOTE SENSE	S+ / S- >0.3V	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	0.35	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 4 Rated : 650V 16A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue (4) Dynamic Load 90%Duty/1KHz (5) Dynamic Load 50%Duty/120Hz Ta : 25°C	(1) 396 V (2) 396 V (3) 392 V (4) 396 V (5) 394 V	P
2	Diode Peak Voltage	Q103 Rated : 100V 30 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue (4)NO LOAD TURN ON (5) Dynamic Load 90%Duty/1KHz (6) Dynamic Load 50%Duty/120Hz Ta : 25°C	(1) 77 V (2) 72 V (3) 75 V (4) 69 V (5) 76 V (6) 76 V	P
3	Input Capacitor Voltage	C 5 Rated : 180u /400V/105°C	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 380 V (2) 374 V (3) 392 V	P
4	Control IC Voltage Test	U 1 Rated : 30 V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 16.3 V (2) 15.4 V (3) 16.2 V	P
5	PFC Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated : 600 V 20 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 404 V (2) 388 V (3) 404 V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 2KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 3.6 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 3.05 mA I/P-FG : 3.11 mA O/P-FG : 3.01 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ I/P-FG : 500VDC>100MΩ O/P-FG : 500VDC>100MΩ	I/P-O/P : 500 VDC I/P-FG : 500 VDC O/P-FG : 500 VDC Ta : 25°C / 70%RH	I/P-O/P : 9999 MΩ I/P-FG : 9999 MΩ O/P-FG : 9999 MΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	5 mΩ	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS D	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 INDUSTRY L-N : 2KV L,N-PE : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT	
1	TEMPERATURE RISE TEST	MODEL : RSP-500-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=24.2℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=49.5℃			P	
		NO	Position	ROOM AMBIENT Ta=24.2℃		HIGH AMBIENT Ta= 49.5℃
		1	D5	38.2℃		65.1℃
		2	U202	38.2℃		64.4℃
		3	ZNR1	26.4℃		53.2℃
		4	LF1	27.6℃		54.7℃
		5	BD1	40.9℃		66.9℃
		6	LF2	30.8℃		57.9℃
		7	R15	34.4℃		61.5℃
		8	L1	33.3℃		61.3℃
		9	Q1	44.8℃		71.9℃
		10	Q2	45.1℃		71.9℃
		11	D10	52.4℃		77.1℃
		12	C5	32.9℃		59.4℃
		13	C6	33.4℃		59.8℃
		14	U1	40.4℃		67.3℃
		15	C61	34.6℃		61.5℃
		16	T2	49.8℃		77.2℃
		17	Q3	53.8℃		82.6℃
		18	Q4	58.5℃		86.7℃
		19	T1coil	63.6℃		90.3℃
		20	T1core	55.6℃		82.2℃
		21	Q101	45.0℃		71.1℃
		22	Q102	40.7℃		67.2℃
		23	TSW2	33.5℃		59.4℃
		24	Q103	37.7℃		64.4℃
		25	Q105	45.8℃		71.8℃
		26	L100	56.6℃		84.9℃
		27	C105	36.6℃		63.2℃
		28	RG1	46.9℃		73.7℃
		29	RTH2	50.1℃		77.6℃
		30	TSW1	35.7℃		63.1℃
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 114 % LOAD Ta : 25℃	TEST : OK	P	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -35℃	TEST : OK	P	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=50.1℃ HUMIDITY= 95 %R.H	TEST : OK	P	

5	TEMPERATURE COEFFICIENT	$\pm 0.05\%/^{\circ}\text{C}$ (0~50 $^{\circ}\text{C}$)	I/P : 230 VAC O/P : FULL LOAD	$\pm 0 \%/^{\circ}\text{C}$ (0~50 $^{\circ}\text{C}$)	P
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40 $^{\circ}\text{C}$ ~ +85 $^{\circ}\text{C}$ 2. Temperature change rate : 25 $^{\circ}\text{C}$ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30 $^{\circ}\text{C}$ ~ +70 $^{\circ}\text{C}$ 2. Temperature change rate : 25 $^{\circ}\text{C}$ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25 $^{\circ}\text{C}$		TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 $^{\circ}\text{C}$ LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=50 $^{\circ}\text{C}$ LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 $^{\circ}\text{C}$ LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 $^{\circ}\text{C}$ LIFE TIME		(1) 1307062 HRS (2) 220095 HRS (3) 211170 HRS (4) 269179 HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 187.7 KHRS			P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 50 $^{\circ}\text{C}$			P

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	Shenym	Wangdz

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