



# Test Report:RSP-100-12

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100W 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 : 100 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 68 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 11.4 V ~ 13.2 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	10.39 V ~ 13.86 V / 230 VAC 10.42 V ~ 13.86 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 : -0.15 % ~ 0.16 %	P
4	LINE REGULATION	V1 : -0.5 % ~ +0.5 % (Max)	I/P : 100 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 % ~ 0 %	P
5	LOAD REGULATION	V1 : -0.5 % ~ +0.5 % (Max)	I/P : 230 VAC O/P : FULL ~ MIN LOAD Ta : 25°C	V1 : -0.15 % ~ 0.15 %	P
6	SET UP TIME	230VAC : 600 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC / 358 ms	P
7	RISE TIME	230VAC : 30 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC / 6.9 ms	P
8	HOLD UP TIME	230VAC : 16 ms (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC / 29.8 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) 552 mVp-p (2) 496 mVp-p (3) 448 mVp-p (4) 1080 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 )	63.706 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	0.93 / 230 VAC(TYP) 0.98 / 115 VAC(TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.968 / 230 VAC PF= 0.996 / 115 VAC	P
4	EFFICIENCY	86% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	86.09 %	P
5	INPUT CURRENT	230V/ 0.55 A (TYP) 115V/ 1.1 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.534 A/ 230 VAC I = 1.053 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 30 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 23.6 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 2 mA/ 240VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.44 mA N-FG : 0.43 mA	P

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~135 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	121.3 %/230VAC 121.2 %/115VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 13.2 V ~16.2 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	15.32 V/230VAC 15.35 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**

1	REMOTE CONTROL	CN1 POWER ON : < 0~0.8V" POWEROFF : 4~10 V"	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	POWER ON : <0~0.8 V POWER OFF : 4~10 V	P
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**COMPONENT STRESS TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor ( D to S) or (C to E) Peak Voltage	Q3 Rated : 500 V 19A	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) 404 V (2) 412 V (3) 396 V (4) 404 V (5) 404 V	P
2	Diode Peak Voltage	Q103 Rated : 60V16A	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) 54.5 V (2) 53.6 V (3) 54.4 V (4) 52.8 V (5) 54.5 V (6) 56.6 V	P
3	Clamp Diode Peak Voltage	D22 Rted : 600 V 1 A	I/P : High-Line +3V = 267 V O/P : (1) Dynamic Load 90%Duty/1KHz (2)Full load continue  Ta : 25°C	(1) 390 V (2) 388 V	P
4	Input Capacitor Voltage	C 5 Rated : 68u /400V/105°C Surge Voltage:450V	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) 372 V (2) 376 V (3) 400 V	P
5	Control IC Voltage Test	U 1 Rated : 26 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) 18.5 V (2) 18.2 V (3) 19.6 V	P
6	PFC Transistor ( D to S) or (C to E) Peak Voltage	Q 1 Rated : 500 V 19 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	(3) 388 V (4) 380 V (3) 392 V	P

■ SAFETY & E.M.C. TEST

**SAFETY TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 4 KVAC/min I/P-FG : 2KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 4.4 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 2.536 mA I/P-FG : 2.796 mA O/P-FG : 1.903 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 LIGHT 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 LIGHT INDUSTRY INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 1KV L,N-PE : 2KV	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-100-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=23.8℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=45.9℃	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 23.5℃</th> <th>HIGH AMBIENT Ta= 45.9℃</th> </tr> </thead> <tbody> <tr><td>1</td><td>U100</td><td>52.6℃</td><td>72.6℃</td></tr> <tr><td>2</td><td>LF1</td><td>47.7℃</td><td>67.5℃</td></tr> <tr><td>3</td><td>BD1</td><td>69.2℃</td><td>87.5℃</td></tr> <tr><td>4</td><td>Q1</td><td>62.2℃</td><td>83.9℃</td></tr> <tr><td>5</td><td>D1</td><td>53.1℃</td><td>73.1℃</td></tr> <tr><td>6</td><td>L1</td><td>72.3℃</td><td>92.0℃</td></tr> <tr><td>7</td><td>D5</td><td>54.6℃</td><td>74.3℃</td></tr> <tr><td>8</td><td>C5</td><td>47.5℃</td><td>67.1℃</td></tr> <tr><td>9</td><td>T2</td><td>52.2℃</td><td>72.9℃</td></tr> <tr><td>10</td><td>Q3</td><td>51.1℃</td><td>71.4℃</td></tr> <tr><td>11</td><td>Q4</td><td>49.2℃</td><td>69.3℃</td></tr> <tr><td>12</td><td>U1</td><td>50.7℃</td><td>70.3℃</td></tr> <tr><td>13</td><td>T1</td><td>75.5℃</td><td>95.3℃</td></tr> <tr><td>14</td><td>TSW1</td><td>60.5℃</td><td>81.3℃</td></tr> <tr><td>15</td><td>L100</td><td>76.7℃</td><td>97.6℃</td></tr> <tr><td>16</td><td>Q103</td><td>70.2℃</td><td>89.7℃</td></tr> <tr><td>17</td><td>Q101</td><td>62.0℃</td><td>81.5℃</td></tr> <tr><td>18</td><td>C105</td><td>52.2℃</td><td>76.4℃</td></tr> <tr><td>19</td><td>C202</td><td>60.0℃</td><td>80.3℃</td></tr> <tr><td>20</td><td>C18</td><td>57.0℃</td><td>76.5℃</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 23.5℃	HIGH AMBIENT Ta= 45.9℃	1	U100	52.6℃	72.6℃	2	LF1	47.7℃	67.5℃	3	BD1	69.2℃	87.5℃	4	Q1	62.2℃	83.9℃	5	D1	53.1℃	73.1℃	6	L1	72.3℃	92.0℃	7	D5	54.6℃	74.3℃	8	C5	47.5℃	67.1℃	9	T2	52.2℃	72.9℃	10	Q3	51.1℃	71.4℃	11	Q4	49.2℃	69.3℃	12	U1	50.7℃	70.3℃	13	T1	75.5℃	95.3℃	14	TSW1	60.5℃	81.3℃	15	L100	76.7℃	97.6℃	16	Q103	70.2℃	89.7℃	17	Q101	62.0℃	81.5℃	18	C105	52.2℃	76.4℃	19	C202	60.0℃	80.3℃	20	C18	57.0℃	76.5℃		P
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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℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																																				
5	TEMPERATURE COEFFICIENT	± 0.05%/℃ (0-50℃)	I/P : 230 VAC O/P : FULL LOAD	± 0 %/℃ (0-50℃)	P																																																																																				
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40℃~ +85℃ 2. Temperature change rate : 25℃ / 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°C~ +70°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 : 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°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°C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=50°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50°C LIFE TIME	(1) 348062HRS (2) 53158HRS (3) 81782HRS (4) 106414HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 288.5 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 50°C		P

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	Shenym	Wangdezhaoh

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