



Test Report:RSP-75-24

75W 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 : 120 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 28 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 22.8 V ~ 26.4 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	20.68 V ~ 27.62 V / 230 VAC 20.67 V ~ 27.35 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 : -0.08 % ~ 0.11 %	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 : -0.08 % ~ 0.08 %	P
6	SET UP TIME	230VAC : 600 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC / 502 ms	P
7	RISE TIME	230VAC : 30 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC / 11.5 ms	P
8	HOLD UP TIME	230VAC : 16 ms (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC / 53.4 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 : 2400 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) 456 mVp-p (2) 156 mVp-p (3) 160 mVp-p (4) 1820 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)	72 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= 0.970 / 230 VAC PF= 0.984 / 115 VAC	P
4	EFFICIENCY	87 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	88.58 %	P
5	INPUT CURRENT	230V/ 0.5 A (TYP) 115V/ 0.9 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.386 A/ 230 VAC I = 0.775 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 35 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 30.1 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 2 mA/ 240VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.25 mA N-FG : 0.22 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	124.1 %/230VAC 124.1 %/115VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 26.4 V ~ 32.4 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	31.05 V/230VAC 30.99 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	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

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q4 Rated : 600 V 10 A	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) 424 V (2) 456 V (3) 424 V (4) 424 V (5) 432 V	P
2	Diode Peak Voltage	Q101 Rated : 200 V 10 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 Ta : 25°C	(1) 154 V (2) 140 V (3) 130 V (4) 156 V	P
3	Clamp Diode Peak Voltage	D 22 Rated : 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) 404 V (2) 400 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) 392 V (2) 388 V (3) 404 V	P
5	Control IC Voltage Test	U 1 Rated : 38 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) 23.6 V (2) 23.6 V (3) 23.7 V	P
6	PFC Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated : 600 V 10 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) 432 V (4) 416 V (3) 440 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 : 3.189 mA I/P-FG : 2.795 mA O/P-FG : 1.251 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-75-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=28.2℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=40.2℃	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 28.2℃</th> <th>HIGH AMBIENT Ta= 40.2℃</th> </tr> </thead> <tbody> <tr><td>1</td><td>U100</td><td>47.5℃</td><td>59.7℃</td></tr> <tr><td>2</td><td>U1</td><td>54.4℃</td><td>66.7℃</td></tr> <tr><td>3</td><td>D3</td><td>54.7℃</td><td>66.1℃</td></tr> <tr><td>4</td><td>ZNR1</td><td>42.0℃</td><td>54.3℃</td></tr> <tr><td>5</td><td>LF1</td><td>44.6℃</td><td>56.9℃</td></tr> <tr><td>6</td><td>BD1</td><td>58.7℃</td><td>70.1℃</td></tr> <tr><td>7</td><td>L3</td><td>58.3℃</td><td>70.1℃</td></tr> <tr><td>8</td><td>Q1</td><td>51.6℃</td><td>63.6℃</td></tr> <tr><td>9</td><td>D2</td><td>51.7℃</td><td>63.3℃</td></tr> <tr><td>10</td><td>C5</td><td>60.3℃</td><td>72.5℃</td></tr> <tr><td>11</td><td>T2</td><td>52.1℃</td><td>66.1℃</td></tr> <tr><td>12</td><td>Q3</td><td>55.6℃</td><td>68.6℃</td></tr> <tr><td>13</td><td>Q4</td><td>58.4℃</td><td>71.4℃</td></tr> <tr><td>14</td><td>T1coil</td><td>89.7℃</td><td>101.4℃</td></tr> <tr><td>15</td><td>C105</td><td>54.3℃</td><td>66.5℃</td></tr> <tr><td>16</td><td>C18</td><td>54.3℃</td><td>68.3℃</td></tr> <tr><td>17</td><td>Q101</td><td>68.3℃</td><td>79.4℃</td></tr> <tr><td>18</td><td>C150</td><td>46.3℃</td><td>58.9℃</td></tr> <tr><td>19</td><td>RTH2</td><td>69.3℃</td><td>81.1℃</td></tr> <tr><td>20</td><td>C61</td><td>51.2℃</td><td>63.4℃</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 28.2℃	HIGH AMBIENT Ta= 40.2℃	1	U100	47.5℃	59.7℃	2	U1	54.4℃	66.7℃	3	D3	54.7℃	66.1℃	4	ZNR1	42.0℃	54.3℃	5	LF1	44.6℃	56.9℃	6	BD1	58.7℃	70.1℃	7	L3	58.3℃	70.1℃	8	Q1	51.6℃	63.6℃	9	D2	51.7℃	63.3℃	10	C5	60.3℃	72.5℃	11	T2	52.1℃	66.1℃	12	Q3	55.6℃	68.6℃	13	Q4	58.4℃	71.4℃	14	T1coil	89.7℃	101.4℃	15	C105	54.3℃	66.5℃	16	C18	54.3℃	68.3℃	17	Q101	68.3℃	79.4℃	18	C150	46.3℃	58.9℃	19	RTH2	69.3℃	81.1℃	20	C61	51.2℃	63.4℃		P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 115 % 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= -30℃	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	± 0.01 %/℃ (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 : -25°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) 497289 HRS (2) 86696 HRS (3) 152045 HRS (4) 209091 HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 296.7 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	Wangdz

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