

MODEL : RSP-2400-12

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 : 121 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 10.8 V~ 13.2 V	I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	10.14 V~ 13.92 V/ 230 VAC 10.14 V~ 13.92 V/ 180 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : 1%~ -1% (Max)	I/P : 180VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 0.1%~ -0.1%	P
4	LINE REGULATION	V1 : 0.5%~ -0.5% (Max)	I/P : 180VAC ~ 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 : 0.05%~ -0.05%	P
6	SET UP TIME	230VAC : 1000 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 515 ms	P
7	RISE TIME	230VAC : 80 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 57 ms	P
8	HOLD UP TIME	230VAC : 12 ms (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 22.3 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 O/P : FULL /Min LOAD 90%DUTY/ 1KHZ Ta : 25°C	293 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	170 V~264V	P
			I/P : LOW-LINE-3V= 177 V HIGH-LINE+15%=300 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST : OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 180 VAC ~ 264 VAC O/P : FULL-MIN LOAD Ta : 25°C	TEST : OK	P
3	POWER FACTOR	0.95 / 230 VAC(TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.962 / 230 VAC	P
4	EFFICIENCY	87% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	88.7 %	P
5	INPUT CURRENT	230V/ 12 A (TYP) 180V/ 15.5 A (TYP)	I/P : 230 VAC	I = 10.29 A/ 230 VAC	P
			I/P : 180 VAC O/P : FULL LOAD Ta : 25°C	I = 13.21 A/ 180 VAC	
6	INRUSH CURRENT	230V/ 60 A (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 55 A/ 230 VAC	P
		COLD START			
7	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 1.3 mA N-FG : 1.3 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	100%~112 %	I/P : 230 VAC O/P : TESTING Ta : 25°C	106.8%/ 230 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 13.8V~ 16.8V	I/P : 230 VAC O/P : MIN LOAD Ta : 25°C	15.06V/ 230 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : TSW1 : 95 ± 5°C O.T.P detect on heatsink of power transistor TSW2 : 95 ± 5°C O.T.P detect on heatsink of O/P diode NO DAMAGE	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 CN3 PIN9-10 SHORT: Shut down Re-power ON CN3 PIN9-10 OPEN: Current Limit	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT															
1	AUXILIARY POWER (AUX)	12V @ 0.1A (Only for Remote ON/OFF control)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	11.93V	P															
2	REMOTE CONTROL	Table1.1 Fig1.2(a)(b)(c) Specification of Remote ON/OFF	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	<table border="1"> <thead> <tr> <th colspan="2">Connection Method</th> <th>Fig1.2(a)</th> <th>Fig1.2(b)</th> <th>Fig1.2(c)</th> </tr> </thead> <tbody> <tr> <td>SW on</td> <td>Output on</td> <td>SW Open</td> <td>SW Open</td> <td>SW Close</td> </tr> <tr> <td>Logic off</td> <td>Output off</td> <td>SW Close</td> <td>SW Close</td> <td>SW Open</td> </tr> </tbody> </table>	Connection Method		Fig1.2(a)	Fig1.2(b)	Fig1.2(c)	SW on	Output on	SW Open	SW Open	SW Close	Logic off	Output off	SW Close	SW Close	SW Open	P
Connection Method		Fig1.2(a)	Fig1.2(b)	Fig1.2(c)																
SW on	Output on	SW Open	SW Open	SW Close																
Logic off	Output off	SW Close	SW Close	SW Open																
3	ALARM SIGNAL OUTPUT	Table2.1 Explanation of alarm <table border="1"> <thead> <tr> <th>Function</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>P OK</td> <td>The signal is "Low" when the power supply is 80% of the rated output voltage-Power OK</td> </tr> <tr> <td></td> <td>The signal turns to be "High" when the power supply is under 80% of the rated output voltage-Power Fail</td> </tr> </tbody> </table>	Function	Description	P OK	The signal is "Low" when the power supply is 80% of the rated output voltage-Power OK		The signal turns to be "High" when the power supply is under 80% of the rated output voltage-Power Fail	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	<table border="1"> <thead> <tr> <th>Output of alarm (P OK, relay contact)</th> <th>Output of alarm (P OK2, TTL Signal)</th> </tr> </thead> <tbody> <tr> <td>Low (0.5V max at 500mA)</td> <td>Low (0.5V max at 10mA)</td> </tr> <tr> <td>High or open (External applied voltage 500mA max.)</td> <td>High or open (External applied voltage 10mA max.)</td> </tr> </tbody> </table>	Output of alarm (P OK, relay contact)	Output of alarm (P OK2, TTL Signal)	Low (0.5V max at 500mA)	Low (0.5V max at 10mA)	High or open (External applied voltage 500mA max.)	High or open (External applied voltage 10mA max.)	P			
Function	Description																			
P OK	The signal is "Low" when the power supply is 80% of the rated output voltage-Power OK																			
	The signal turns to be "High" when the power supply is under 80% of the rated output voltage-Power Fail																			
Output of alarm (P OK, relay contact)	Output of alarm (P OK2, TTL Signal)																			
Low (0.5V max at 500mA)	Low (0.5V max at 10mA)																			
High or open (External applied voltage 500mA max.)	High or open (External applied voltage 10mA max.)																			
4	OUTPUT VOLTAGE PROGRAMMABLE(PV)	(1) Adjustment of output voltage is possible between 20-110%(Typ.) of the rated output which is shown in Fig. 3.1 (2) Connecting a resistor externally between PV and-S on CN1 or CN2 that is shown in Fig. 3.2	I/P : 230 VAC O/P : NOL LOAD Ta : 25°C	PV=1V , Vout=2.506 V PV=3V , Vout=7.324 V PV=5V , Vout=12.103 V PV=5.5, Vout= 13.374 V	P															
5	CURRENT SHARING	PSU1-PSU2 < 10%	I/P : 230 VAC O/P : 90%/50% LOAD Ta : 25°C	O/P : 90% LOAD PSU1 : 147.8 A PSU2 : 149.1 A PSU3 : 154.7 A O/P : 50% PSU1 : 81 A PSU2 : 81.7A PSU3 : 88.1A	P															
6	REMOTE SENSE	>0.25V	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	> 0.25 V	P															
7	FAN SPEED CONTROL	-----	I/P : 230 VAC O/P : FULL /NOLOAD Ta : 25°C	NO LOAD Fan Voltage=7.24 V 100% LOAD Fan Voltage=12.412 V	P															

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																																																								
1	TEMPERATURE RISE TEST	MODEL : RSP-2400-24 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 35.7 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 54.2 °C																																																																																																																											
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>P/N</th> <th>ROOM AMBIENT Ta= 35.7 °C</th> <th>HIGH AMBIENT Ta= 54.2 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>TR-807</td><td>63.2°C</td><td>78.9°C</td></tr> <tr><td>2</td><td>BD1</td><td>25A/600V D25XB60</td><td>69.3°C</td><td>86.6°C</td></tr> <tr><td>3</td><td>L1</td><td>CK TF1939</td><td>56.4°C</td><td>71.2°C</td></tr> <tr><td>4</td><td>D2</td><td>STTH3006DPI 30A/600V</td><td>59.5°C</td><td>77.9°C</td></tr> <tr><td>5</td><td>Q5</td><td>SPW20N60C3 20.7A/600V</td><td>49.7°C</td><td>68.8°C</td></tr> <tr><td>6</td><td>C7</td><td>470u/420V 105°C HU</td><td>48.7°C</td><td>67.6°C</td></tr> <tr><td>7</td><td>U900</td><td>UCC2818</td><td>46.1°C</td><td>64.8°C</td></tr> <tr><td>8</td><td>U1</td><td>TNY280</td><td>63.8°C</td><td>82.6°C</td></tr> <tr><td>9</td><td>ZD80</td><td>TVS P6KE200A</td><td>64.5°C</td><td>83.7°C</td></tr> <tr><td>10</td><td>T2</td><td>TF-1806A</td><td>66.1°C</td><td>86.3°C</td></tr> <tr><td>11</td><td>U223</td><td>UCC2895DW</td><td>47.1°C</td><td>66.6°C</td></tr> <tr><td>12</td><td>T6</td><td>TF-1813</td><td>51.4°C</td><td>71.9°C</td></tr> <tr><td>13</td><td>Q51</td><td>TK40J60T 40A/600V</td><td>58.8°C</td><td>82.1°C</td></tr> <tr><td>14</td><td>D980</td><td>BYC8-600 8A/600V</td><td>51.7°C</td><td>72.1°C</td></tr> <tr><td>15</td><td>L2</td><td>TF-1805</td><td>59.7°C</td><td>78.4°C</td></tr> <tr><td>16</td><td>D981</td><td>BYC8-600 8A/600V</td><td>56.3°C</td><td>78.8°C</td></tr> <tr><td>17</td><td>T5</td><td>TF-1811</td><td>69.9°C</td><td>91.7°C</td></tr> <tr><td>18</td><td>D106</td><td>60CPQ150 60A/150V</td><td>67.2°C</td><td>86.3°C</td></tr> <tr><td>19</td><td>L102</td><td>TF1808</td><td>58.1°C</td><td>77.1°C</td></tr> <tr><td>20</td><td>C116</td><td>1500u/35V UL10Kh ZLH</td><td>54.5°C</td><td>73.8°C</td></tr> <tr><td>21</td><td>Q530</td><td>STP60NF06L 60A/60V</td><td>50.0°C</td><td>70.0°C</td></tr> <tr><td>22</td><td>TSW2</td><td>ST-22W-R0 85°C</td><td>62.4°C</td><td>81.0°C</td></tr> <tr><td>23</td><td>TSW1</td><td>ST-22W-R0 100°C</td><td>62.0°C</td><td>85.9°C</td></tr> </tbody> </table>	NO	Position	P/N	ROOM AMBIENT Ta= 35.7 °C	HIGH AMBIENT Ta= 54.2 °C	1	LF1	TR-807	63.2°C	78.9°C	2	BD1	25A/600V D25XB60	69.3°C	86.6°C	3	L1	CK TF1939	56.4°C	71.2°C	4	D2	STTH3006DPI 30A/600V	59.5°C	77.9°C	5	Q5	SPW20N60C3 20.7A/600V	49.7°C	68.8°C	6	C7	470u/420V 105°C HU	48.7°C	67.6°C	7	U900	UCC2818	46.1°C	64.8°C	8	U1	TNY280	63.8°C	82.6°C	9	ZD80	TVS P6KE200A	64.5°C	83.7°C	10	T2	TF-1806A	66.1°C	86.3°C	11	U223	UCC2895DW	47.1°C	66.6°C	12	T6	TF-1813	51.4°C	71.9°C	13	Q51	TK40J60T 40A/600V	58.8°C	82.1°C	14	D980	BYC8-600 8A/600V	51.7°C	72.1°C	15	L2	TF-1805	59.7°C	78.4°C	16	D981	BYC8-600 8A/600V	56.3°C	78.8°C	17	T5	TF-1811	69.9°C	91.7°C	18	D106	60CPQ150 60A/150V	67.2°C	86.3°C	19	L102	TF1808	58.1°C	77.1°C	20	C116	1500u/35V UL10Kh ZLH	54.5°C	73.8°C	21	Q530	STP60NF06L 60A/60V	50.0°C	70.0°C	22	TSW2	ST-22W-R0 85°C	62.4°C	81.0°C	23	TSW1	ST-22W-R0 100°C	62.0°C	85.9°C	P
NO	Position	P/N	ROOM AMBIENT Ta= 35.7 °C	HIGH AMBIENT Ta= 54.2 °C																																																																																																																									
1	LF1	TR-807	63.2°C	78.9°C																																																																																																																									
2	BD1	25A/600V D25XB60	69.3°C	86.6°C																																																																																																																									
3	L1	CK TF1939	56.4°C	71.2°C																																																																																																																									
4	D2	STTH3006DPI 30A/600V	59.5°C	77.9°C																																																																																																																									
5	Q5	SPW20N60C3 20.7A/600V	49.7°C	68.8°C																																																																																																																									
6	C7	470u/420V 105°C HU	48.7°C	67.6°C																																																																																																																									
7	U900	UCC2818	46.1°C	64.8°C																																																																																																																									
8	U1	TNY280	63.8°C	82.6°C																																																																																																																									
9	ZD80	TVS P6KE200A	64.5°C	83.7°C																																																																																																																									
10	T2	TF-1806A	66.1°C	86.3°C																																																																																																																									
11	U223	UCC2895DW	47.1°C	66.6°C																																																																																																																									
12	T6	TF-1813	51.4°C	71.9°C																																																																																																																									
13	Q51	TK40J60T 40A/600V	58.8°C	82.1°C																																																																																																																									
14	D980	BYC8-600 8A/600V	51.7°C	72.1°C																																																																																																																									
15	L2	TF-1805	59.7°C	78.4°C																																																																																																																									
16	D981	BYC8-600 8A/600V	56.3°C	78.8°C																																																																																																																									
17	T5	TF-1811	69.9°C	91.7°C																																																																																																																									
18	D106	60CPQ150 60A/150V	67.2°C	86.3°C																																																																																																																									
19	L102	TF1808	58.1°C	77.1°C																																																																																																																									
20	C116	1500u/35V UL10Kh ZLH	54.5°C	73.8°C																																																																																																																									
21	Q530	STP60NF06L 60A/60V	50.0°C	70.0°C																																																																																																																									
22	TSW2	ST-22W-R0 85°C	62.4°C	81.0°C																																																																																																																									
23	TSW1	ST-22W-R0 100°C	62.0°C	85.9°C																																																																																																																									
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 105 % LOAD Ta : 25°C	TEST : OK	P																																																																																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230 VAC O/P : 100% LOAD Ta= -25°C	TEST : OK	P																																																																																																																								
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																																																								
5	TEMPERATURE COEFFICIENT	± 0.05 %(0-50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.011 %(0-50°C)	P																																																																																																																								
6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10-500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 2G (5) Test Time : 1 hour in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	P																																																																																																																								

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 2 KVAC/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 : 11.2 mA I/P-FG : 10.58 mA O/P-FG : 8.12 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 : 10.28 GΩ I/P-FG : 12.3 GΩ O/P-FG : 10.5 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	8 mΩ	P
4	APPROVAL	TUV : Certificate NO : R50146436 UL : File NO : E183223			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2,-3 CLASS A	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 A	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				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	RSP-2400-24 : SUPPOSE C116 IS THE MOST CRITICAL COMPONENT	I/P : 230VAC O/P : FULL LOAD Ta=25 °C LIFE TIME=843641.5 HRS I/P : 230VAC O/P : FULL LOAD Ta=50 °C LIFE TIME=141071.9 HRS		P
2	MTBF	Conducted by Parts Stress Analysis Prediction 234.1K hrs min. Telcordia SR-332 (Bellcore) ; 83.9K hrs min. MIL-HDBK-217F (25°C)			P
3	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure : Above 50,000 hours @ TA 50°C			P



COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q50 Rated TK40J60T: 40A/600V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25°C	(1) 528 V (2) 412 V	P
2	Diode Peak Voltage	D101 Rated S60SC6MT :60A/60V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short Ta : 25°C	(1) 45.2 V (2) 39.2 V	P
3	Input Capacitor Voltage	C5 Rated 470u/420V 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) 379.7 V (2) 382.8 V (3) 382.5 V	P
4	Control IC Voltage Test	U223 Rated UCC2895DW : 11.8V-17V	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) 12.867 V (2) 12.870 V (3) 12.871 V	P
5	Power Transistor (D to S) or (C to E) Peak Voltage	Q5 Rated SPW20N60C3: 20.7A/600V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25°C	(1) 580 V (2) 408 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/4/21	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/6/23	PRODUCT SAMPLE W0905B39	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023