

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</td> <td>Output on</td> <td>SW Open</td> <td>SW Open</td> <td>SW Close</td> </tr> <tr> <td>Logic</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	Output on	SW Open	SW Open	SW Close	Logic	Output off	SW Close	SW Close	SW Open	P
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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 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					
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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 : 81.7 A PSU3 : 88.1 A	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			P																																																																																																																								
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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 692.3K 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