

MODEL : RPSG-160-5

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 : 32 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 4.5 V- 5.5 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25 °C	4.311 V- 5.611 V / 230 VAC 4.309 V- 5.611 V / 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : 4%~ -4 % (Max)	I/P : 100 VAC / 264 VAC O/P : FULL / MIN LOAD Ta : 25 °C	V1 : 0.12 %~ -0.12 %	P
4	LINE REGULATION	V1 : 0.5 %~ -0.5 % (Max)	I/P : 100 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25 °C	V1 : 0.12 %~ -0.12 %	P
5	LOAD REGULATION	V1 : 1 %~ -1 % (Max)	I/P : 230 VAC O/P : FULL -MIN LOAD Ta : 25 °C	V1 : 0.12 %~ -0.12 %	P
7	SET UP TIME	230VAC : 1200 ms (Max) 115 VAC : 2500 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25 °C	230VAC/ 1080 ms 115VAC/ 2160 ms	P
8	RISE TIME	230VAC : 30 ms (Max) 115VAC : 30 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25 °C	230VAC/ 4.8 ms 115VAC/ 4.8 ms	P
9	HOLD UP TIME	230VAC : 16 ms (TYP) 115VAC : 16 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25 °C	230VAC/ 29 ms 115VAC/ 21 ms	P
10	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25 °C	TEST : < 5 %	P
11	DYNAMIC LOAD	V1 : 1000 mVp-p	I/P : 230 VAC O/P : FULL /Min LOAD 90%DUTY/1KHZ Ta : 25 °C	699 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	100VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25 °C	73V~264V	P
			I/P : LOW-LINE-3V= 97V 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 : 100 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= 0.953 / 230 VAC PF= 0.99 / 115 VAC	P
4	EFFICIENCY	85% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25 °C	86.5 %	P
5	INPUT CURRENT	230V/ 1.1 A (TYP) 115V/ 2 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25 °C	I = 0.82 A/ 230 VAC I = 1.63 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 70 A (TYP) 115V/ 35 A(TYP) COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25 °C	I = 56 A/230 VAC I = 28 A/ 115 VAC	P
7	LEAKAGE CURRENT	EARTH LEAKAGE CURRENT<300 uA PATIENT LEAKAGE CURRENT<100 uA	I/P : 264 VAC O/P : Min LOAD Ta : 25 °C	FOR EARTH : L-FG : 142 uA N-FG : 142 uA FOR PATIENT L-FG : 79 uA N-FG : 79 uA	P
8	No load power consumption	<0.75W/240VAC	I/P : 264 VAC O/P : NO LOAD PS/ON -GND SHORT Ta : 25 °C	0.26W/240VAC	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	117%/ 230 VAC 117%/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 5.75V~6.75 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25 °C	6.10V/ 230 VAC 6.10V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : TSW1 : 110 ± 5°C O.T.P. NO DAMAGE TSW2 : 95 ± 5°C O.T.P. NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active 1、Shut down o/p voltage、recovers automatically after temperature goes down 2、Shut down Re-power ON	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25 °C	NO DAMAGE Hiccup Mode	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	POWER GOOD SIGNAL	DELAY 10ms ~ 500ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25 °C	92ms/ 230 VAC 92ms/ 115 VAC	P
2	POWER FAIL SIGNAL	> 1ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25 °C	4.3ms/ 230 VAC 4.3ms/ 115 VAC	P
3	PS-ON INPUT SIGNAL	Power on : PS-ON="Hi" or ">2V" Power off : PS-ON="Low" or "<0.5V"	I/P : 230 VAC O/P : FULL LOAD Ta : 25 °C	PS-ON= 1.6 V PS-ON= 1.5 V	P
4	REMOTE SENSE	>0.3V	I/P : 230 VAC O/P : FULL LOAD Ta : 25 °C	> 0.3 V	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT		
1	TEMPERATURE RISE TEST	MODEL : RPSG-160-5 WITH FAN				P	
		1. ROOM AMBIENT BURN-IN : 1.5 HRS					
		I/P : 230VAC O/P : FULL LOAD Ta= 42.8 °C					
		2. HIGH AMBIENT BURN-IN : 3 HRS					
		I/P : 230VAC O/P : FULL LOAD Ta= 47.1 °C					
		NO	Position	P/N	ROOM AMBIENT Ta= 42.8 °C		HIGH AMBIENT Ta= 47.1 °C
		1	BD1	4A/800V US4KB80R	62.1°C		66.8°C
		2	L3	TF1669-R2	58.8°C		63.2°C
		3	LF2	TR865	54.2°C		89.0°C
		4	Q4	2SK3568	71.2°C		76.1°C
		5	T2	TR816	63.0°C		68.4°C
		6	D1	BYC10X-600 10A/600V	70.4°C		75.7°C
		7	U1	FAN4801NY	52.5°C		59.4°C
		8	T1	TF1671	78.7°C		82.3°C
		9	Q103	STP85N3LH5 80A/30V	78.3°C		87.2°C
		10	C5	120u/420V 105°C PT	58.3°C		64.4°C
		11	C106	2200u/10V UL10Kh ZLH	52.6°C		60.8°C
		12	L100	TR763	75.5°C		84.1°C
		13	C61	22u/50V L5Kh KY	63.6°C		72.6°C
14	ZD901	ST02D-200 AX078	82.4°C	89.1°C			
15	U903	TNY 275	82.3°C	89.6°C			
16	TSW1	110°C	57.1°C	61.9°C			
17	T900	TF1670	81.4°C	85.6°C			
18	TSW2	95°C	64.3°C	72.0°C			
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 126 % 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	± 0.03 % (0-50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.01 % (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 : 4 KVAC/min I/P-FG : 1.5 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 4.4 KVAC/min I/P-FG : 1.8 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25 °C	I/P-O/P : 1.704 mA I/P-FG : 2.431 mA O/P-FG : 0.202 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 : 30 GΩ I/P-FG : 30 GΩ O/P-FG : 30 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25 °C / 70%RH	7 mΩ	P
4	APPROVAL	TUV : Certificate NO : UL : File NO :			N/A

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 EN55011 CLASS B	I/P : 230 VAC (50HZ)115V/60HZ O/P : FULL/50% LOAD Ta : 25 °C	PASS Test by certified Lab	P
3	RADIATION	EN55022 EN55011 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 MEDICAL AIR : 8KV / Contact : 6KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25 °C	CRITERIA A	P
5	E.F.T	EN61000-4-4 MEDICAL	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25 °C	CRITERIA A	P
6	SURGE	IEC61000-4-5 MEDICAL	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	RPSG-160-5 WITH FAN : SUPPOSE I/P : 230VAC O/P : FULL LOAD I/P : 230VAC O/P : FULL LOAD	C106 IS THE MOST CRITICAL COMPONENT Ta= 25 °C LIFE TIME= 1456243 HRS Ta= 50 °C LIFE TIME= 196462 HRS		P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 230.5 k HRS			P
3	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure : Above 30,000 hours @ TA 40°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	Q 3 Rated 2SK3568 12A/500V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25 °C	(1) 450 V (2) 458 V	P
2	Diode Peak Voltage	Q101 Rated IRL3103PbF 64A/30V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short Ta : 25 °C	(1) 26 V (2) 26.4 V	P
3	PFC Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated IRFP460A 20A/500V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25 °C	(1) 436 V (2) 430 V	P
4	Input Capacitor Voltage	C 5 Rated 120u/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) 379.9 V (2) 380.7 V (3) 380.8 V	P
5	Control IC Voltage Test	U 1 Rated FAN4801 : 12V-30V	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) 14.36 V (2) 14.4 V (3) 14.4 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/9/17	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/3/11	PRODUCT SAMPLE W0810A12	PASS	SANFORD SU	VINCENT TSENG
2009/3/25	PRODUCT SAMPLE W0902B22	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023