



Features:

- Universal AC input / Full range
- Built-in active PFC function
- Protections: Short circuit / Overload / Over voltage / Over temperature
- 5"x3" compact size
- Free air convection for 100W and 145W with 20.5 CFM forced air
- With power good and fail signal output
- No load power consumption under 0.75W by PS-ON control (G model)
- Standby 5V@0.8A with fan, @0.6A without fan (G model)
- 3 years warranty

G: With 5Vsb & no load power consumption < 0.75 W RPT **G** - 160A
Blank: Basic function (without 5Vsb)

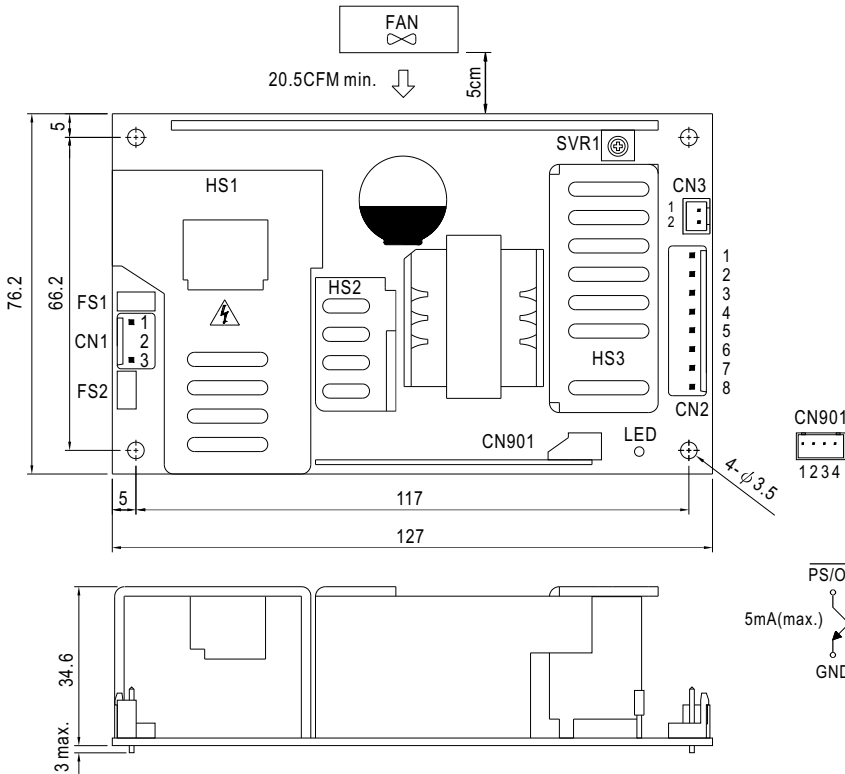


SPECIFICATION

MODEL	RPT□-160A			RPT□-160B			RPT□-160C			RPT□-160D					
OUTPUT NUMBER	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3			
DC VOLTAGE	5V	12V	-5V	5V	12V	-12V	5V	15V	-15V	5V	12V	24V			
RATED CURRENT (20.5CFM)	14A	5.5A	1A	14A	5A	1A	14A	3.6A	1A	11A	5A	1.2A			
CURRENT RANGE (convection)	0.6 ~ 9A	0.2 ~ 3.8A	0.1 ~ 0.6A	0.6 ~ 9A	0.2 ~ 3.4A	0.1 ~ 0.8A	0.6 ~ 9A	0.1 ~ 2.6A	0.1 ~ 0.8A	0.3 ~ 8A	0.2 ~ 2.6A	0.15 ~ 1A			
CURRENT RANGE (20.5CFM)	0.6 ~ 14A	0.2 ~ 5.5A	0.1 ~ 1A	0.6 ~ 14A	0.2 ~ 5A	0.1 ~ 1A	0.6 ~ 14A	0.1 ~ 3.6A	0.1 ~ 1A	0.3 ~ 11A	0.2 ~ 5A	0.15 ~ 1.2A			
RATED POWER (convection) Note.7	98.6W			98.4W			99W			98.2W					
RATED POWER (20.5CFM) Note.8	145W			146W			143W			147.8W					
RIPPLE & NOISE (max.) Note.2	100mVp-p	120mVp-p	120mVp-p	100mVp-p	120mVp-p	120mVp-p	100mVp-p	150mVp-p	150mVp-p	100mVp-p	120mVp-p	200mVp-p			
VOLTAGE ADJ. RANGE	CH1:5 ~ 5.5V														
VOLTAGE TOLERANCE Note.3	±2.0%	±5.0%	-5,+7%	±2.0%	±5.0%	-4,+5%	±2.0%	±4.0%	+8.0%	±2.0%	±5.0%	+7,-5%			
LINE REGULATION	±0.5%	±1.0%	±1.0%	±0.5%	±1.0%	±1.0%	±0.5%	±1.0%	±1.0%	±0.5%	±1.0%	±1.0%			
LOAD REGULATION	±1.5%	±3.0%	-5,+6%	±1.5%	±3.0%	-4,+5%	±2.0%	±3.0%	±8.0%	±1.5%	±3.0%	-3,+4%			
SETUP, RISE TIME	1200ms, 30ms/230VAC			2500ms, 30ms/115VAC at full load											
HOLD UP TIME (Typ.)	16ms/230VAC/115VAC at full load														
VOLTAGE RANGE Note.6	90 ~ 264VAC		127 ~ 370VDC												
FREQUENCY RANGE	47 ~ 63Hz														
POWER FACTOR (Typ.)	PF>0.93/230VAC			PF>0.98/115VAC at full load											
EFFICIENCY (Typ.)	84%			84%			83%			83%					
AC CURRENT (Typ.)	1.8A/115VAC		0.9A/230VAC												
INRUSH CURRENT (Typ.)	COLD START 35A/115VAC			70A/230VAC											
LEAKAGE CURRENT	Earth leakage current <300uA / 264VAC, Patient leakage current <100uA/264VAC														
OVERLOAD	105 ~ 135% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed														
OVER VOLTAGE	CH1: 5.75 ~ 6.75V Protection type : Shut down o/p voltage, re-power on to recover														
OVER TEMPERATURE	105°C (TSW1) detect on heatsink of power transistor 90°C (TSW2) detect on heatsink of power transistor Protection type : (TSW1) Shut down o/p voltage, recovers automatically after temperature goes down Protection type : (TSW2) Shut down o/p voltage, re-power on to recover														
5V STANDBY (G model)	5VSB : 5V@0.6A without fan, 0.8A with fan 20.5CFM ; tolerance ± 2%, ripple : 50mVp-p(max.)														
PS-ON INPUT SIGNAL (G model)	Power on: PS-ON = "Hi" or " > 2 ~ 5V" ; Power off: PS-ON = "Low" or " < 0 ~ 0.5V"														
POWER GOOD / POWER FAIL	500ms>PG>10ms PF>1ms														
WORKING TEMP.	-20 ~ +70°C (Refer to output load derating curve)														
WORKING HUMIDITY	20 ~ 90% RH non-condensing														
STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH														
TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)														
VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes														
SAFETY STANDARDS	UL60601-1, TUV EN60601-1 approved														
WITHSTAND VOLTAGE	I/P-O/P:4KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC														
ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH														
EMI CONDUCTION & RADIATION	Compliance to EN55011 (CISPR11), EN55022 (CISPR22) Class B														
HARMONIC CURRENT	Compliance to EN61000-3-2,-3														
EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, EN60601-1-2, EN61204-3, medical level, criteria A														
MTBF	191.4Khrs min. MIL-HDBK-217F (25°C)														
DIMENSION	127*76.2*34.6mm (L*W*H)														
PACKING	0.33Kg; 36pcs/12.9Kg/0.79CUFT														
NOTE	<ol style="list-style-type: none"> 1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. 5. HS1,HS2 & HS3 can not be shorted. 6. Derating may be needed under low input voltages. Please check the derating curve for more details. 7. The rated power includes 5Vsb @ 0.6A. 8. The rated power includes 5Vsb @ 0.8A. 														

Mechanical Specification

Unit:mm



AC Input Connector (CN1) : JST B3P-VH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	AC/N	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
2	No Pin		
3	AC/L		

DC Output Connector (CN2) : JST B8P-VH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1,2,3,4	COM	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
5,6	CH1		
7	CH2		
8	CH3		

Power Good Connector(CN3):JST B2B-XH or equivalent

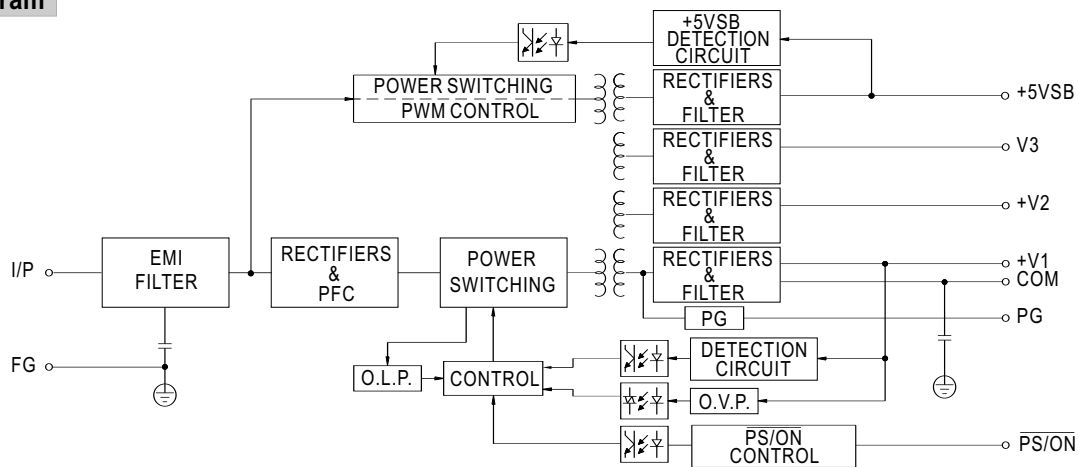
Pin No.	Status	Mating Housing	Terminal
1	PG	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2	GND		

5VSB Connector(CN901) : JST B-XH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	PS/ON	JST XHP or equivalent	JST SXH-001T or equivalent
2,4	GND		
3	5VSB		

⚠ HS1,HS2,HS3 can not be shorted

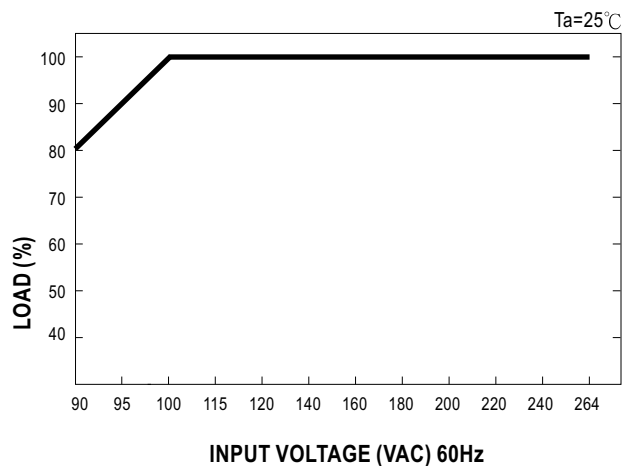
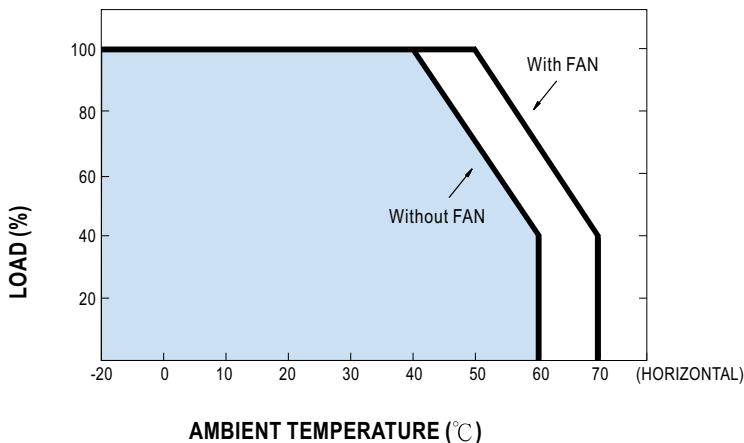
Block Diagram



fosc :100KHz

Derating Curve

Output Derating VS Input Voltage



MODEL : RPT-160C

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 100 mVp-p (Max) V2 : 150 mVp-p (Max) V3 : 150 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 7 mVp-p (Max) V2 : 31 mVp-p (Max) V3 : 14 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 5 V- 5.5 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	4.58 V- 5.65 V/ 230 VAC 4.58 V- 5.65 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : 2 %- -2 % (Max) V2 : 4 %- -4 % (Max) V3 : 8 %- -8 % (Max)	I/P : 100 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 1 %- -1 % V2 : 2.2 %- -2.2 % V3 : 2.9 %- -2.9 %	P
4	LINE REGULATION	V1 : 0.5 %- -0.5 % (Max) V2 : 1 %- -1 % (Max) V3 : 1 %- -1 % (Max)	I/P : 100 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 %- 0 % V2 : 0.04 %- -0.04 % V3 : 0.12 %- -0.12 %	P
5	LOAD REGULATION	V1 : 2 %- -2 % (Max) V2 : 3 %- -3 % (Max) V3 : 8 %- -8 % (Max)	I/P : 230 VAC O/P : FULL -MIN LOAD Ta : 25°C	V1 : 1 %- -1 % V2 : 0.83 %- -0.83 % V3 : 2.9 %- -2.9 %	P
6	CROSS REGULATION	V1 : 2 %- -2 % (Max) V2 : 3 %- -3 % (Max) V3 : 8 %- -8 % (Max)	I/P : 230 VAC O/P : Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta : 25°C	V1 : 0.24 %- -0.24 % V2 : 2.2 %- -1.2 % V3 : 3.7 %- -2.9 %	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/ 974 ms 115VAC/ 1948 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/ 7 ms 115VAC/ 7 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/ 33 ms 115VAC/ 24 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	210 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC-264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	67 V-264V	P
			I/P : LOW-LINE-3V= 87 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 : 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= 0.946 / 230 VAC PF= 0.996 / 115 VAC	P
4	EFFICIENCY	83% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	84.17 %	P
5	INPUT CURRENT	230V/ 0.9 A (TYP) 115V/ 1.8 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.78 A/ 230 VAC I = 1.52 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 = 64 A/ 230 VAC I = 32 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 : 165 uA N-FG : 110 uA FOR PATIENT L-FG : 93.5 uA N-FG : 91.3 uA	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	119 %/ 230 VAC 118 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 5.75 V~ 6.75 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	6.27 V/ 230 VAC 6.17 V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : TSW1 : 105 ± 5°C detect on heatsink of power transistor TSW2 : 90 ± 5°C detect on heatsink of power transistor Protection type : TSW1 : Shut down o/p voltage, recovers automatically after temperature goes down TSW2 : Shut down o/p voltage, re-power on to recover NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active TSW1 : Shut down o/p voltage, recovers automatically after temperature goes down TSW2 : Shut down o/p voltage, re-power on to recover	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	90 ms/ 230 VAC 91 ms/ 115 VAC	P
2	POWER FAIL SIGNAL	> 1ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	33 ms/ 230 VAC 26 ms/ 115 VAC	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : RPT-160A WITH FAN 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 26.7 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 50.7 °C			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 120 % 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	± 0.008 %(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 : 4.2 KVAC/min I/P-FG : 1.8 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 1.914 mA I/P-FG : 2.287 mA O/P-FG : 0.206 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	9 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) 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 INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 MEDICAL 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	RPT-160A WITH FAN : SUPPOSE I/P : 230VAC O/P : FULL LOAD I/P : 230VAC O/P : FULL LOAD	C 105 IS THE MOST CRITICAL COMPONENT Ta= 25 °C LIFE TIME= 201640 HRS Ta= 50 °C LIFE TIME= 26809 HRS		P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 191.4KHRS			P

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 2SK3568 12A/500V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25°C	(1) 412 V (2) 416 V	P
2	Diode Peak Voltage	Q101 Rated IRL3103PbF 64A/30V D200 Rated FME-220A 20A/100V D300 Rated FME-220A 20A/100V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short Ta : 25°C	(1) 25.8 V (2) 25.4 V (1) 57.2 V (2) 57.2 V (1) 89.2 V (2) 75.2 V	P
3	Input Capacitor Voltage	C5 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) 383.2 V (2) 384.1 V (3) 384.1 V	P
4	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) 14.411 V (2) 14.465 V (3) 14.472 V	P
5	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 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) 474 V (2) 404 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/1/10	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/6/16	PRODUCT SAMPLE W0901A22	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023