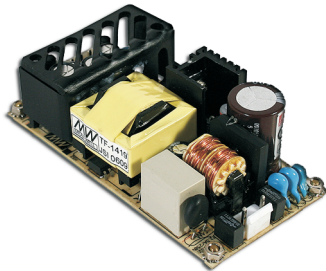
**■ Features :**

- 4"x2" miniature size
- Universal AC input / Full range
- Low leakage current < 200uA
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- UL60601-1/IEC60601-1/EN60601-1 medical safety approved
- UL60950-1/IEC60950-1/EN60950-1 ITE safety approved
- Fixed switch frequency at 100KHz
- 3 years warranty

**SPECIFICATION**

MODEL		RPT-60A			RPT-60B			RPT-60C		
OUTPUT	OUTPUT NUMBER	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3
	DC VOLTAGE	5V	12V	-5V	5V	12V	-12V	5V	15V	-15V
	RATED CURRENT	4A	2A	0.5A	4A	2A	0.5A	4A	1.5A	0.5A
	CURRENT RANGE	0.5 ~ 4.4A	0.1 ~ 2.2A	0.1 ~ 0.55A	0.5 ~ 4.4A	0.1 ~ 2.2A	0.1 ~ 0.55A	0.5 ~ 4.4A	0.1 ~ 1.65A	0.1 ~ 0.55A
	RATED POWER	46.5W			50W			50W		
	PEAK LOAD(10sec.) <small>Note.4</small>	51.15W			55W			55W		
	RIPPLE & NOISE (max.) <small>Note.2</small>	80mVp-p	80mVp-p	80mVp-p	80mVp-p	80mVp-p	100mVp-p	80mVp-p	100mVp-p	150mVp-p
	VOLTAGE TOLERANCE <small>Note.3</small>	+3,-2%	±6.0%	+9,-8%	+3,-2%	±6.0%	+6,-10%	+3,-2%	±6.0%	±8.0%
	LINE REGULATION	±0.5%	±1.0%	±1.0%	±0.5%	±1.0%	±2.0%	±0.5%	±2.0%	±2.0%
	LOAD REGULATION	±1.5%	±2.0%	+5,-7%	±1.5%	±2.0%	±5.0%	±1.5%	±3.0%	±4.0%
	SETUP, RISE TIME	200ms, 15ms/230VAC			200ms, 15ms/115VAC at full load					
HOLD UP TIME (Typ.)	70ms/230VAC		15ms/115VAC at full load							
INPUT	VOLTAGE RANGE	90 ~ 264VAC		127 ~ 370VDC						
	FREQUENCY RANGE	47 ~ 63Hz								
	EFFICIENCY (Typ.)	77%			78%			79%		
	AC CURRENT (Typ.)	1.1A/115VAC		0.7A/230VAC						
	INRUSH CURRENT (Typ.)	COLD START 60A/230VAC		30A/115VAC						
LEAKAGE CURRENT	For earth <200uA/264VAC, For patient <100uA/264VAC									
PROTECTION	OVERLOAD	115 ~ 150% 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								
ENVIRONMENT	WORKING TEMP.	-20 ~ +65°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 ~ 45°C)								
VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes									
SAFETY & EMC <small>(Note 5)</small>	SAFETY STANDARDS	UL60950-1, TUV EN60950-1, UL60601-1, TUV EN60601-1, IEC60601-1 approved								
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC			I/P-FG:1.5KVAC			O/P-FG:1.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC								
	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									
OTHERS	MTBF	677.8Khrs min. MIL-HDBK-217F (25°C)								
	DIMENSION	101.6*50.8*29mm (L*W*H)								
	PACKING	0.15Kg; 96pcs/15.4Kg/0.89CUFT								
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. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power. 5. 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. 6. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time. 									



■ Features :

- 4"x2" miniature size
- Universal AC input / Full range
- Low leakage current <200uA
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- UL60601-1/IEC60601-1/EN60601-1 medical safety approved
- UL60950-1/IEC60950-1/EN60950-1 ITE safety approved
- Fixed switch frequency at 100KHz
- 3 years warranty

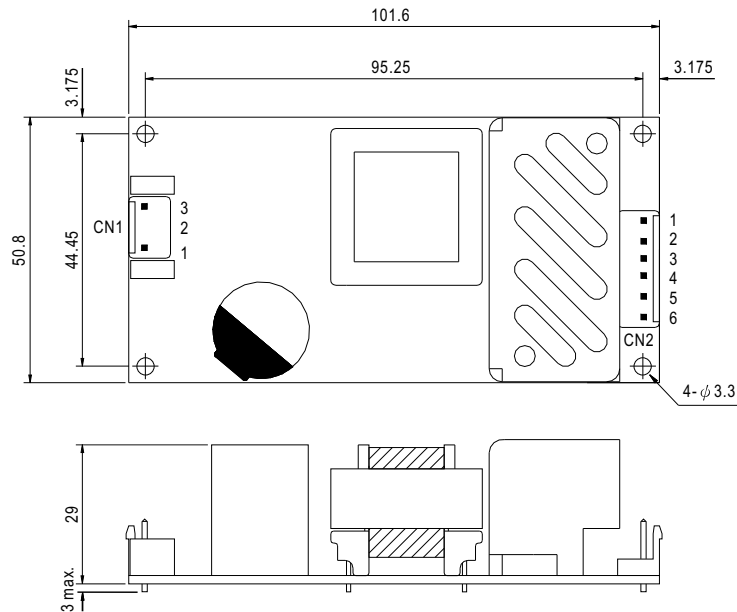


SPECIFICATION

MODEL	RPT-60D			RPT-6003			
OUTPUT	OUTPUT NUMBER	CH1	CH2	CH3	CH1	CH2	CH3
	DC VOLTAGE	5V	24V	12V	3.3V	5V	12V
	RATED CURRENT	3.5A	1A	0.5A	5A	3A	0.7A
	CURRENT RANGE	0.5 ~ 3.85A	0.1 ~ 1.1A	0.1 ~ 0.55A	0.5 ~ 5.5A	0.3 ~ 3.3A	0.1 ~ 0.77A
	RATED POWER	47.5W			39.9W		
	PEAK LOAD(10sec.) Note.4	52.25W			43.9W		
	RIPPLE & NOISE (max.) Note.2	80mVp-p	150mVp-p	80mVp-p	80mVp-p	80mVp-p	80mVp-p
	VOLTAGE TOLERANCE Note.3	+3,-2%	±6.0%	±8.0%	+3,-2%	±8.0%	+6,-10%
	LINE REGULATION	±0.5%	±2.0%	±2.0%	±0.5%	±1.0%	±2.0%
	LOAD REGULATION	±1.5%	±3.0%	±4.0%	±1.5%	±2.0%	+5.5,-5%
	SETUP, RISE TIME	200ms, 15ms/230VAC 200ms, 15ms/115VAC at full load					
HOLD UP TIME (Typ.)	70ms/230VAC 15ms/115VAC at full load						
INPUT	VOLTAGE RANGE	90 ~ 264VAC 127 ~ 370VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY (Typ.)	79%		75%			
	AC CURRENT (Typ.)	1.1A/115VAC 0.7A/230VAC					
	INRUSH CURRENT (Typ.)	COLD START 60A/230VAC 30A/115VAC					
LEAKAGE CURRENT	For earth <200uA/264VAC, For patient <100uA/264VAC						
PROTECTION	OVERLOAD	115 ~ 150% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	CH1: 5.75 ~ 6.75V		CH1: 3.8 ~ 4.45V Protection type : Shut down o/p voltage, re-power on to recover			
ENVIRONMENT	WORKING TEMP.	-20 ~ +65°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 ~ 45°C)					
VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes						
SAFETY & EMC (Note 5)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1, UL60601-1, TUV EN60601-1, IEC60601-1 approved					
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC I/P-FG:1.5KVAC O/P-FG:1.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC					
	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						
OTHERS	MTBF	677.8Khrs min. MIL-HDBK-217F (25°C)					
	DIMENSION	101.6*50.8*29mm (L*W*H)					
	PACKING	0.15Kg; 96pcs/15.4Kg/0.89CUFT					
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. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power. 5. 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. 6. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time. 						

Mechanical Specification

Unit:mm



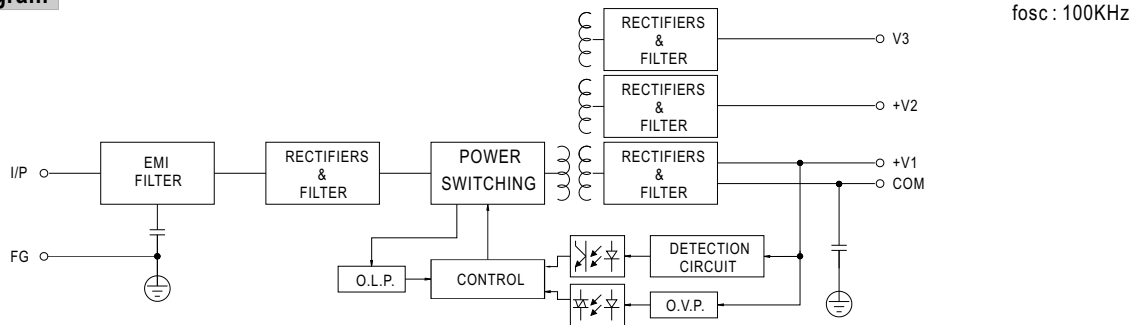
AC Input Connector (CN1) : JST B3P-VH or equivalent

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		

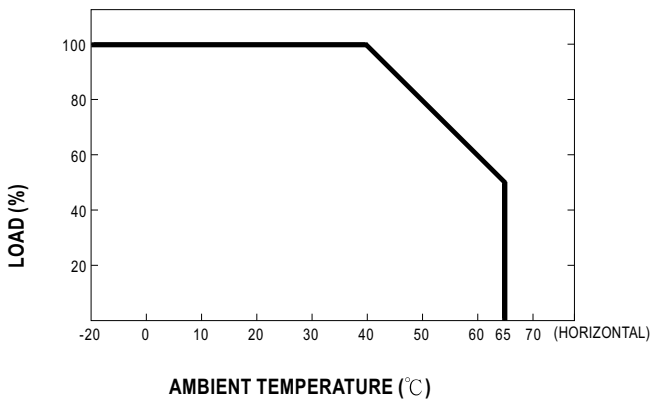
DC Output Connector (CN2) : JST B6P-VH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1,2	V1	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
3,4	COM		
5	V2		
6	V3		

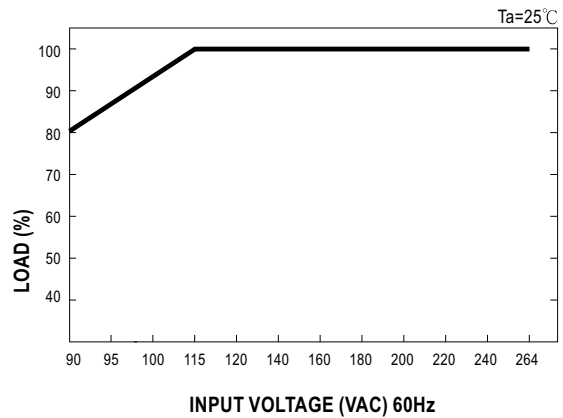
Block Diagram



Derating Curve



Output Derating VS Input Voltage



MODEL : RPT-60D

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 80 mVp-p (Max) V2: 150 mVp-p (Max) V3: 80 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 21 mVp-p (Max) V2: 16 mVp-p (Max) V3: 23 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1: 3 %- -2 % (Max) V2: 6 %- -6 % (Max) V3: 8 %- -8 % (Max)	I/P: 115 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.12 %- -0.12 % V2: 1.7 %- -1.7 % V3: 2.8 %- -2.8 %	P
3	LINE REGULATION	V1: 0.5 %- -0.5 % (Max) V2: 2 %- -2 % (Max) V3: 2 %- -2 % (Max)	I/P: 115 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0 %- 0 % V2: 0.4 %- -0.4 % V3: 1 %- -0.15 %	P
4	LOAD REGULATION	V1: 1.5 %- -1.5 % (Max) V2: 3 %- -3 % (Max) V3: 4 %- -4 % (Max)	I/P: 230 VAC O/P:FULL -MIN LOAD Ta:25°C	V1: 0.12 %- -0.12 % V2: 0.7 %- -0.7 % V3: 1.5 %- -1.5 %	P
5	CROSS REGULATION	V1: 1.5 %- -1.5 % (Max) V2: 3 %- -3 % (Max) V3: 4 %- -4 % (Max)	I/P: 230 VAC O/P: Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta:25°C	V1: 0.12 %- -0.12 % V2: 1.6 %- -1.6 % V3: 2.4 %- -2.4 %	P
6	SET UP TIME	230VAC: 200 ms (Max) 115 VAC: 200 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 160 ms 115VAC/ 148 ms	P
7	RISE TIME	230VAC: 15 ms (Max) 115VAC: 15 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 9 ms 115VAC/ 9 ms	P
8	HOLD UP TIME	230VAC: 70 ms (TYP) 115VAC: 14 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 84 ms 115VAC/ 17.3 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: 1000 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	99 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	67V~264V	P
			I/P: LOW-LINE-3V= 87V 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: 90VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
3	EFFICIENCY	79% (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	79.9 %	P
4	INPUT CURRENT	230V/ 0.7 A (TYP) 115V/ 1.1 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 0.62 A/ 230 VAC I = 0.94 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 60 A (TYP) 115V/ 30 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 58 A/ 230 VAC I = 27 A/ 115 VAC	P
6	LEAKAGE CURRENT	< 200 uA / 264 VAC	I/P: 264 VAC O/P:Min LOAD Ta:25°C	L-FG: 105 uA N-FG: 105 uA	p
		< 100 uA/264 VAC for patient	I/P: 264 VAC O/P:Min LOAD Ta:25°C	L-FG: 36 uA N-FG 36 uA	p

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	115%~ 150%	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C	134 %/ 230 VAC 131 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 5.75V~ 6.75V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	6.4 V/ 230 VAC 6.7 V/ 115 VAC Shunt down Re- power ON	P
3	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

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : RPT-60A 1. ROOM AMBIENT BURN-IN : 1HRS I/P: 230VAC O/P: FULL LOAD Ta= 29.5 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 39.6 °C			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: V1=5.7A V2=2.5A V3=0.55A 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= -20°C	TEST : OK	P
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 40°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	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 4 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 1.5 KVAC/min	I/P-O/P: 4.2 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C	I/P-O/P: 2.14 mA I/P-FG: 1.49 mA O/P-FG: 1.54 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	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	3 mΩ	P
4	APPROVAL	TUV: Certificate NO : R 50112371 UL: File NO : E227340			P

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	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	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 77256 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 26543 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 677.8K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated K2545 : 600V 6 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Output Short Ta:25°C	(1) 502 V (2) 518 V	P
2	Diode Peak Voltage	D100 Rated MBR20H100 : 100V 20A D200 Rated BYQ28X-200 : 200V 10 A D300 Rated HER303 : 200V 3A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 55 V (2) 50 V (1) 186 V (2) 166 V (1) 148 V (2) 130 V	P
3	Clamp Diode Peak Voltage	D1 Rated EGP20J : 600V 2A	I/P:High-Line +3V = 267 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 452 V	P
4	Input Capacitor Voltage	C5 Rated : 100u / 400V/ 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) 386 V (2) 384 V (3) 386 V	P
5	Control IC Voltage Test	U1 Rated 1230D : 18V	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) 13.4 V (2) 13.2 V (3) 13.2 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2006/4/3	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2006/6/2	PRODUCT SAMPLE W0605A33	PASS	VINCENT TSENG	MAX LIN
2006/8/16	PRODUCT SAMPLE W0607C20	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023