



■ Features

- 4"x2" compact size
- Medical safety approved (2 x MOPP) according to ANSI/AAMI ES60601-1 and IEC/EN60601-1
- Suitable for BF application with appropriate system consideration
- Cooling by free air convection
- EMI class B for class I configuration
- Extremely low leakage current
- Protections: Short circuit / Overload / Over voltage
- 3 years warranty

■ Applications

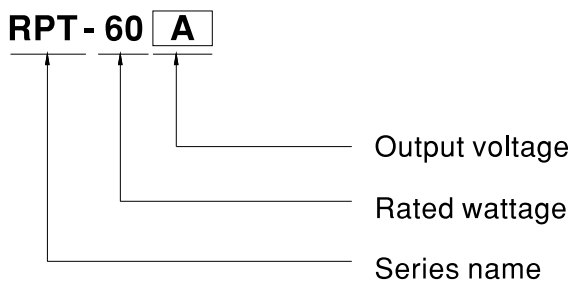
- Oral irrigator
- Hemodialysis machine
- Medical computer monitors
- Sleep apnea devices

■ Description

RPT-60 is a 60W highly reliable green PCB type medical power supply with a high power density on the 4" by 2" footprint. It accepts 90~264VAC input and offers dual output voltages .

RPT-60 is able to be used for Class I (with FG) system design. The extremely low leakage current is less than 150 μ A. In addition, it conforms to international medical regulations (2*MOPP) and EMC EN55011.

■ Model Encoding



SPECIFICATION

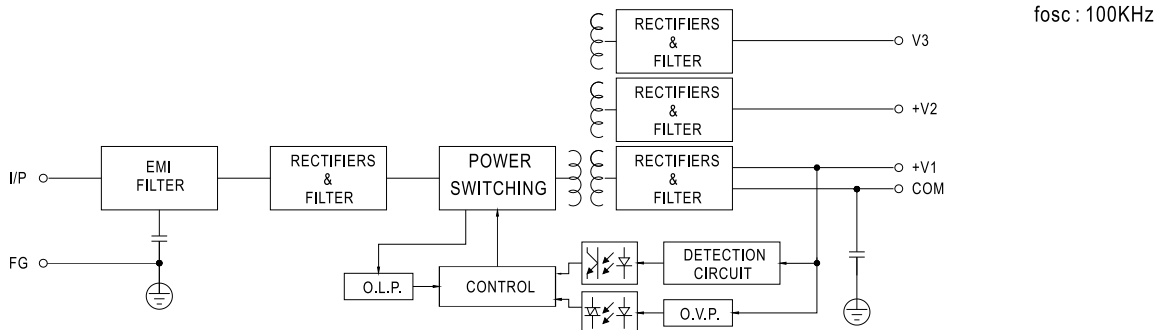
MODEL		RPT-60A			RPT-60B			RPT-60C		
OUTPUT	OUTPUT NUMBER	CH1	CH2	CH3	CH1	CH2	CH3	CH1	CH2	CH3
	DC VOLTAGE	5V	12V	-5V	5V	12V	-12V	5V	15V	-15V
	RATED CURRENT	4A	2A	0.5A	4A	2A	0.5A	4A	1.5A	0.5A
	CURRENT RANGE	0.5 ~ 4.4A	0.1 ~ 2.2A	0.1 ~ 0.55A	0.5 ~ 4.4A	0.1 ~ 2.2A	0.1 ~ 0.55A	0.5 ~ 4.4A	0.1 ~ 1.65A	0.1 ~ 0.55A
	RATED POWER	46.5W			50W			50W		
	PEAK LOAD(10sec.) Note.2	51.15W			55W			55W		
	RIPPLE & NOISE (max.) Note.3	80mVp-p	80mVp-p	80mVp-p	80mVp-p	80mVp-p	100mVp-p	80mVp-p	100mVp-p	150mVp-p
	VOLTAGE TOLERANCE Note.4	+3,-2%	±6.0%	+9,-8%	+3,-2%	±6.0%	+10,-6%	+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	300ms, 15ms/230VAC			300ms, 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 Note.5	Earth leakage current < 150 μA/264VAC , Touch current < 100 μA/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 "Derating Curve")								
	WORKING HUMIDITY	20 ~ 90% RH non-condensing								
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH non-condensing								
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 45°C)								
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes								
OPERATING ALTITUDE Note.6	3000 meters									
SAFETY & EMC (Note 8)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1, IEC60601-1, EAC TP TC 004, UL ANSII/AAMI ES60601-1, CAN/CSA-C22.2 No. 60601-1:14 - Edition 3 approved, TUV EN60601-1 approved								
	ISOLATION LEVEL	Primary-Secondary: 2xMOPP, Primary-Earth: 1xMOPP, Secondary-Earth: 1xMOPP								
	WITHSTAND VOLTAGE	I/P-O/P: 4KVAC I/P-FG: 2KVAC O/P-FG: 1.5KVAC								
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG: 100M Ohms / 500VDC / 25°C / 70% RH								
	EMC EMISSION	Parameter	Standard				Test Level / Note			
		Conducted emission	EN55011 (CISPR11)				Class B			
		Radiated emission	EN55011 (CISPR11)				Class B			
		Harmonic current	EN61000-3-2				Class A			
	Voltage flicker	EN61000-3-3				----				
	EMC IMMUNITY	EN60601-1-2								
Parameter		Standard				Test Level / Note				
ESD		EN61000-4-2				Level 4, 15KV air ; Level 4, 8KV contact				
RF field susceptibility		EN61000-4-3				Level 3, 10V/m(80MHz~2.7GHz) Table 9, 9~28V/m(385MHz~5.78GHz)				
EFT bursts		EN61000-4-4				Level 3, 2KV				
Surge susceptibility		EN61000-4-5				Level 4, 4KV/Line-FG ; 2KV/Line-Line				
Conducted susceptibility		EN61000-4-6				Level 3, 10V				
Magnetic field immunity		EN61000-4-8				Level 4, 30A/m				
Voltage dip, interruption	EN61000-4-11				100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods					
OTHERS	MTBF	677.8K hrs min. MIL-HDBK-217F (25°C)								
	DIMENSION (L*W*H)	101.6*50.8*29mm or 4" * 2" * 1.14" inch								
	PACKING	0.15Kg; 96pcs/15.4Kg/0.89CUFT								
NOTE	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.</p> <p>3. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μf & 47 μf parallel capacitor.</p> <p>4. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>5. Touch current was measured from primary input to DC output.</p> <p>6. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).</p> <p>7. 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.</p> <p>8. Heat Sink HS1, HS2 can not be shorted.</p> <p>9. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies."</p>									

File Name: RPT-60-SPEC 2018-01-12

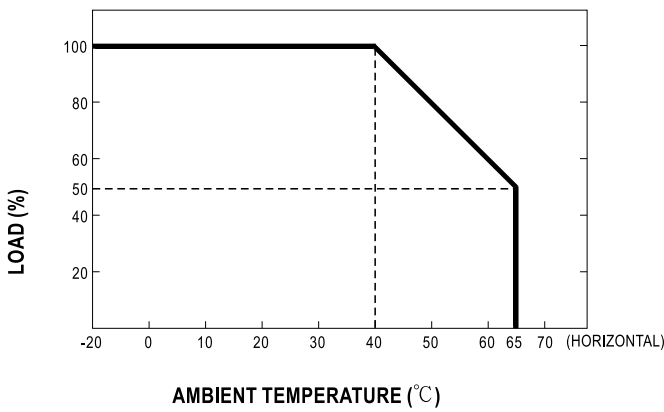
SPECIFICATION

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.2	52.25W			43.89W			
	RIPPLE & NOISE (max.) Note.3	80mVp-p	150mVp-p	80mVp-p	80mVp-p	80mVp-p	80mVp-p	
	VOLTAGE TOLERANCE Note.4	+3,-2%	±6.0%	±8.0%	+3,-2%	±8.0%	+10,-6%	
	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	300ms, 15ms/230VAC 300ms, 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 Note.5	Earth leakage current < 150 μA/264VAC , Touch current < 100 μA/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			
ENVIRONMENT	WORKING TEMP.	-20 ~ +65°C (Refer to "Derating Curve")						
	WORKING HUMIDITY	20 ~ 90% RH non-condensing						
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C , 10 ~ 95% RH non-condensing						
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 45°C)						
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes						
OPERATING ALTITUDE Note.6	3000 meters							
SAFETY & EMC (Note 9)	SAFETY STANDARDS	UL60950-1,TUV EN60950-1,IEC60601-1, EAC TP TC 004,UL ANSI/AAMI ES60601-1, CAN/CSA-C22.2 No. 60601-1:14 - Edition 3 approved, TUV EN60601-1 approved						
	ISOLATION LEVEL	Primary-Secondary: 2xMOPP, Primary-Earth:1xMOPP, Secondary-Earth:1xMOPP						
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC I/P-FG:2KVAC O/P-FG:1.5KVAC						
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25 / 70% RH						
	EMC EMISSION	Parameter	Standard			Test Level / Note		
		Conducted emission	EN55011 (CISPR11)			Class B		
		Radiated emission	EN55011 (CISPR11)			Class B		
		Harmonic current	EN61000-3-2			Class A		
	Voltage flicker	EN61000-3-3			-----			
	EMC IMMUNITY	EN60601-1-2						
Parameter		Standard			Test Level / Note			
ESD		EN61000-4-2			Level 4, 15KV air ; Level 4, 8KV contact			
RF field susceptibility		EN61000-4-3			Level 3, 10V/m(80MHz~2.7GHz) Table 9, 9~28V/m(385MHz~5.78GHz)			
EFT bursts		EN61000-4-4			Level 3, 2KV			
Surge susceptibility		EN61000-4-5			Level 4, 4KV/Line-FG ; 2KV/Line-Line			
Conducted susceptibility		EN61000-4-6			Level 3, 10V			
Magnetic field immunity	EN61000-4-8			Level 4, 30A/m				
Voltage dip, interruption	EN61000-4-11			100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods				
OTHERS	MTBF	677.8K hrs min. MIL-HDBK-217F (25°C)						
	DIMENSION (L*W*H)	101.6*50.8*29mm or 4" * 2" *1.14" inch						
	PACKING	0.15Kg; 96pcs/15.4Kg/0.89CUFT						
NOTE	<ol style="list-style-type: none"> All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μf & 47μf parallel capacitor. Tolerance : includes set up tolerance, line regulation and load regulation. Touch current was measured from primary input to DC output. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft). 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. Heat Sink HS1,HS2 can not be shorted. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." 							

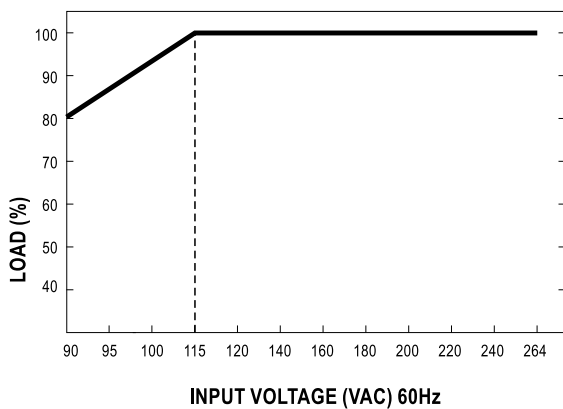
Block Diagram



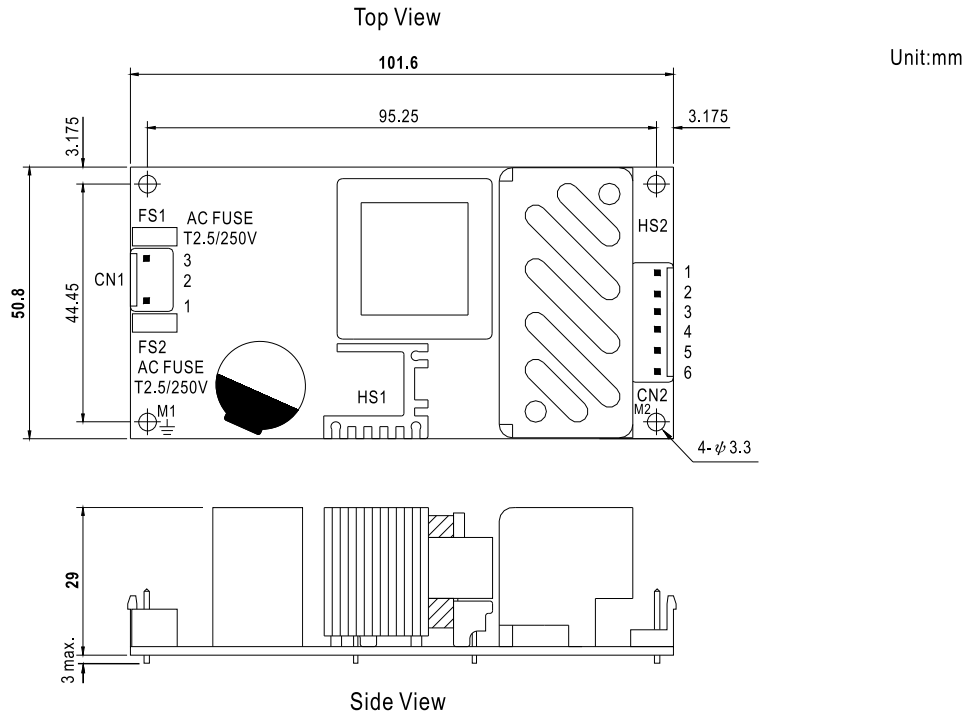
Derating Curve



Output Derating VS Input Voltage



■ Mechanical Specification



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		

⏏ : Grounding Required



- 1.HS1,HS2 cannot be shorted.
- 2.M1 is safety ground. For better EMC performance,
Please secure an electrical connection between
M1,M2 and chassis grounding.