

# RPT-60 series







Suitable for BF application with appropriate system consideration



## Applications

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

## GTIN CODE

MW Search: <u>https://www.meanwell.com/serviceGTIN.aspx</u>

Extremely low leakage current

Features

• 4"×2" compact size

· Cooling by free air convection

• EMI class B for class I configuration

Protections: Short circuit / Overload / Over voltage

· Medical safety approved (2 x MOPP) according to

ANSI/AAMI ES60601-1 and IEC/BS EN/EN60601-1

3 years warranty

### 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  $150 \mu$ A. In addition, it conforms to international medical regulations (2\*MOPP) and EMC BS EN/EN55011.







### SPECIFICATION

MODEL		RPT-60A			RPT-60B			RPT-60C		
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	
					-				0.1 ~ 0.55	
			0.1 0.00/(		0.1 2.2/1	0.1 0.00/1			0.1 0.00	
			90m\/n n		00m\/n n	100m\/n n				
	· · ·								150mVp-p	
	,		,	,	_		,		±8.0%	
									±2.0%	
LOAD REGULATION	±1.5%	±2.0%	+5,-7%	±1.5%	±2.0%	±5.0%	±1.5%	±3.0%	$\pm 4.0\%$	
SETUP, RISE TIME	300ms, 15ms/230VAC 300ms, 15ms/115VAC at full load									
HOLD UP TIME (Typ.)	70ms/230VAC 15ms/115VAC at full load									
VOLTAGE RANGE	90 ~ 264VAC 127 ~ 370VDC									
FREQUENCY RANGE	47 ~ 63Hz									
EFFICIENCY (Typ.)	77%			78% 79%						
AC CURRENT (Typ.)	1.1A/115VA	C 0.7A/	230VAC							
INRUSH CURRENT (Typ.)										
,										
					- 100 <i>µ</i> /120+	Wito				
OVERLOAD										
	-		ioue, recovers a	utomatically a	ner iault condit	ion is removed				
	CH1: 5.75 ~ 6.75V									
	Protection type : Shut down o/p voltage, re-power on to recover									
WORKING TEMP.	-20 ~ +65°C	(Refer to "De	rating Curve")							
WORKING HUMIDITY	20 ~ 90% RH non-condensing									
STORAGE TEMP., HUMIDITY	-40 ~ +85°C	, 10 ~ 95% RH	I non-condensin	g						
TEMP. COEFFICIENT										
VIBRATION	10 ~ 500Hz,									
OPERATING ALTITUDE Note.6	3000 meters	5	· · ·							
ISOLATION LEVEL WITHSTAND VOLTAGE	TUV BS EN/ EN 62368-1:2014+A11, EAC TP TC 004 approved         Primary-Secondary: 2xMOPP, Primary-Earth:1xMOPP, Secondary-Earth:1xMOPP         I/P-O/P:4KVAC       I/P-FG:2KVAC         O/P-FG:1.5KVAC									
ISOLATION RESISTANCE	I/P-O/P, I/P-	FG, 0/P-FG:1	00M Ohms / 500	)VDC/25°C/	70% RH					
	Parameter	,		Standard			Test Level / Note			
							Class B			
EMC EMISSION										
				B3 EN/EN01000-3-3						
				Standard			Te of Level / Nete			
	ESD			BS EN/EN61000-4-2			Level 4, 15KV air ; Level 4, 8KV cont			
EMC IMMUNITY	RF field susceptibility			BS EN/EN61000-4-3						
							Table 9, 9~28V/m( 385MHz~5.78GHz )			
	EFT bursts									
	Surge susceptibility				Level 4, 4KV/Line-FG ; 2KV/Line-Li					
	Conducted	susceptibili	ty	BS EN/EN	BS EN/EN61000-4-6		Level 3, 10V			
	Magnetic fi	eld immunity	/	BS EN/EN61000-4-8		Level 4, 30A/m				
	Voltage dip, interruption BS EN/EN61000-4-11 100% interruption									
MTBF	4415.3K hrs min. Telcordia SR-332 (Bellcore) ; 677.8K hrs min. MIL-HDBK-217F (25℃)									
DIMENSION (L*W*H)	101.6*50.8*29mm or 4" * 2" *1.14" inch									
PACKING	0.15Kg; 96p	cs/15.4Kg/0.8	9CUFT							
<ol> <li>2. 33% Duty cycle maximum with</li> <li>3. Ripple &amp; noise are measured</li> <li>4. Tolerance : includes set up to</li> <li>5. Touch current was measured</li> <li>6. The ambient temperature der</li> </ol>	thin every 30 s at 20MHz of b blerance, line re from primary is rating of $3.5^{\circ}$ C/ sured at cold fil be shorted.	econds. Avera bandwidth by u egulation and l input to DC ou 1000m with far rst start. Turnir	age output power using a 12" twister oad regulation. htput. nless models and	should not ex d pair-wire ter d of 5°C/1000 power supply r	ceed the rated minated with a n with fan mode nay lead to incre	power. 0.1 µf & 47 µf par els for operating ease of the set u	altitude higher p time.	than 2000m(650	,	
	DC VOLTAGE RATED CURRENT CURRENT RANGE RATED POWER PEAK LOAD(10sec.) Note.2 RIPPLE & NOISE (max.) Note.3 VOLTAGE TOLERANCE Note.4 LINE REGULATION LOAD REGULATION SETUP, RISE TIME HOLD UP TIME (Typ.) VOLTAGE RANGE FREQUENCY RANGE EFFICIENCY (Typ.) AC CURRENT (Typ.) INRUSH CURRENT (Typ.) LEAKAGE CURRENT Note.5 OVERLOAD OVER VOLTAGE WORKING TEMP. WORKING HUMIDITY STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION OPERATING ALTITUDE Note.6 SAFETY STANDARDS ISOLATION LEVEL WITHSTAND VOLTAGE ISOLATION RESISTANCE EMC EMISSION ISOLATION RESISTANCE EMC EMISSION I All parameters NOT specially 3 Si% Dub & noise are measure der Tolerance : includes set up to 5. Tolerance : includes set up	OUTPUT NUMBER         CH1           DC VOLTAGE         5V           RATED CURRENT         4A           CURRENT RANGE         0.5 ~ 4.4A           RATED POWER         46.5W           PEAK LOAD(10sec.)         Note.2           PEAK LOAD(10sec.)         Note.3           NOTPP         VOLTAGE TOLERANCE Note.4           VOLTAGE TOLERANCE Note.4         43.72%           LINE REGULATION         ± 1.5%           SETUP, RISE TIME         300ms, 15m           HOLD UP TIME (Typ.)         70ms/230VA           VOLTAGE RANGE         90 ~ 264VAC           FREQUENCY RANGE         47 ~ 63Hz           EFFICIENCY (Typ.)         77%           AC CURRENT (Typ.)         1.1A/115VA           INRUSH CURRENT (Typ.)         COLD STAR           LEAKAGE CURRENT Note.5         Earth leakage           OVERLOAD         Protection ty           OVER VOLTAGE         Protection ty           OVER VOLTAGE         20 ~ +65°C           WORKING TEMP.         -20 ~ +65°C           WORKING TEMP.         -20 ~ +65°C           VBRATION         10 ~ 500Hz,           OPERATING ALTITUDE Note.6         3000 meters           SAFETY STANDARDS         IEC 60601-1	OUTPUT NUMBER         CH1         CH2           DC VOLTAGE         5V         12V           RATED CURRENT         4A         2A           CURRENT RANGE         0.5 ~ 4.4A         0.1 ~ 2.2A           RATED POWER         46.5W         PEAK LOAD(10sec.)         Note.2           PEAK LOAD(10sec.)         Note.2         51.15W         RIPPLE & NOISE (max.) Note.3         80mVp-p           VOLTAGE TOLERANCE Note.4         +3.2%         ± 6.0%         ± 1.0%           LINE REGULATION         ± 1.5%         ± 2.0%         SETUP, RISE TIME         300ms, 15ms/230VAC           VOLTAGE RANGE         90 ~ 264VAC         127 ~ 3         FREQUENCY RANGE         47 ~ 63Hz           EFFICIENCY (Typ.)         77%          AC CURRENT (Typ.)         COLD START 60A/230V           VEAKAGE CURRENT         Note.5         Earth leakage current < 18	OUTPUT NUMBER         CH1         CH2         CH3           DC VOLTAGE         5V         12V         -5V           RATED CURRENT         4A         2A         0.5A           CURRENT RANGE         0.5 ~ 4.4A         0.1 ~ 22A         0.1 ~ 0.5A           CURRENT RANGE         0.5 ~ 4.4A         0.1 ~ 22A         0.1 ~ 0.5A           RATED POWER         46.5W         PEAK LOAD(10sec.)         Note.2         51.15W           RIPPLE & NOISE (max.) Note.3         80mVp-p         80mVp-p         80mVp-p           VOLTAGE TOLERANCE Note.4         43.2%         ± 6.0%         +9.8%           LINE REGULATION         ± 0.5%         ± 1.0%         ± 1.0%           LOAD REGULATION         ± 1.5%         ± 2.0%         +5.7%           SETUP, RISE TIME         300ms, 15ms/230VAC         300ms, 15ms/230VAC         300/ms, 15ms/230VAC           HOLD UP TIME (Typ.)         70ms/230VAC         137 ~ 370VDC         FREQUENCY RANGE         47 ~ 63Hz           EFFICIENCY (Typ.)         1.1A/115VAC         0.7A/230VAC         30A/11           LEAKAGE CURRENT (Typ.)         1.1A/115VAC         0.7A/230VAC         30A/11           LEAKAGE CURRENT (Typ.)         COLD START 60A/230VAC         30A/11         15 ~ 150% A/120 A/120 A/120 A/120	OUTPUT NUMBER         CH1         CH2         CH3         CH1           DC VOLTAGE         5V         12V         -5V         5V           RATED CURRENT         4A         2A         0.5A         4A           CURRENT RANGE         0.5 ~ 4.4A         0.1 ~ 2.2A         0.1 ~ 0.55A         0.5 ~ 4.4A           RATED POWER         46.5W         50W         55W         50W           PEAK LOAD(10sec).         Note.2         51.5W         55W         55W           RIPPLE & NOISE (max.) Note.3         80m/Vp-p         80m/Vp-P <t< td=""><td>OUTPUT NUMBER         CH1         CH2         CH3         CH1         CH2           DC YOLTAGE         5V         12V         5V         5V         12V           RATED CURRENT         4A         2A         0.5A         4A         2A           CURRENT RANGE         0.5 - 4.4A         0.1 - 2.2A         0.1 - 0.55A         0.5 - 4.4A         0.1 - 2.2A           RATED OPWER         46.5W         50W         50W         50W         50W           PEAK LOAD(10sec.)         Note.2         51.15W         55W         50W         50W&lt;</td><td>OUTPUT NUMBER         CH1         CH2         CH3         CH1         CH2         CH3         CH1         CH2         CH3           DC VOITAGE         SV         12V         -5V         5V         12V         12V         12V           RATED CURRENT RANGE         0.5 – 4.4A         0.1 – 0.5SA         0.5 – 4.4A         0.1 – 0.5SA           CURRENT RANGE         0.5 – 4.4A         0.1 – 0.5SA         0.5 – 4.4A         0.1 – 0.5SA           RATED CURRENT GANCE Nees, 3         15.15W         55W         55W         100-%         100-%           RIPPLE &amp; NOISE (max.) Nees, 3         15.15W         55W         10.0%         + 1.0.%         + 2.0%         + 1.0.%         + 2.0%         + 1.0.%         + 2.0%         + 5.0%         55W           LIAR REGULATION         + 1.5%         + 2.0%         + 5.7%         + 1.5%         + 2.0%         + 5.7%         + 1.0.%         + 2.0%         + 5.0%         55W           HOLD UP TIME (Typ.)         70m:230/AC         15ms/115VAC at full load         VOLTAGE TANDE         Farth Issage current - 1.50 At 24264/AC.         TANDE         Earth Issage current - 1.50 At 24264/AC.         TANDE         Earth Issage current - 1.50 At 24264/AC.         TANDE         Earth Issage current - 1.50 At 24264/AC.         TANDE         Eart</td><td>OUTPUT NUMBER         CH1         CH2         CH3         CH1         CH2         CH3         CH1         CH2         CH3         CH1           DC VOLTAGE         SV         T2V         -SV         SV         SV</td><td>QUTPUTNUMBER         CH1         CH2         CH3         CH1         CH2         CH3         CH1         CH2         CH2         CH3         CH1         CH2         <thch2< th=""> <th< td=""></th<></thch2<></td></t<>	OUTPUT NUMBER         CH1         CH2         CH3         CH1         CH2           DC YOLTAGE         5V         12V         5V         5V         12V           RATED CURRENT         4A         2A         0.5A         4A         2A           CURRENT RANGE         0.5 - 4.4A         0.1 - 2.2A         0.1 - 0.55A         0.5 - 4.4A         0.1 - 2.2A           RATED OPWER         46.5W         50W         50W         50W         50W           PEAK LOAD(10sec.)         Note.2         51.15W         55W         50W         50W<	OUTPUT NUMBER         CH1         CH2         CH3         CH1         CH2         CH3         CH1         CH2         CH3           DC VOITAGE         SV         12V         -5V         5V         12V         12V         12V           RATED CURRENT RANGE         0.5 – 4.4A         0.1 – 0.5SA         0.5 – 4.4A         0.1 – 0.5SA           CURRENT RANGE         0.5 – 4.4A         0.1 – 0.5SA         0.5 – 4.4A         0.1 – 0.5SA           RATED CURRENT GANCE Nees, 3         15.15W         55W         55W         100-%         100-%           RIPPLE & NOISE (max.) Nees, 3         15.15W         55W         10.0%         + 1.0.%         + 2.0%         + 1.0.%         + 2.0%         + 1.0.%         + 2.0%         + 5.0%         55W           LIAR REGULATION         + 1.5%         + 2.0%         + 5.7%         + 1.5%         + 2.0%         + 5.7%         + 1.0.%         + 2.0%         + 5.0%         55W           HOLD UP TIME (Typ.)         70m:230/AC         15ms/115VAC at full load         VOLTAGE TANDE         Farth Issage current - 1.50 At 24264/AC.         TANDE         Earth Issage current - 1.50 At 24264/AC.         TANDE         Earth Issage current - 1.50 At 24264/AC.         TANDE         Earth Issage current - 1.50 At 24264/AC.         TANDE         Eart	OUTPUT NUMBER         CH1         CH2         CH3         CH1         CH2         CH3         CH1         CH2         CH3         CH1           DC VOLTAGE         SV         T2V         -SV         SV         SV	QUTPUTNUMBER         CH1         CH2         CH3         CH1         CH2         CH3         CH1         CH2         CH2         CH3         CH1         CH2         CH2 <thch2< th=""> <th< td=""></th<></thch2<>	



### SPECIFICATION

MODEL		RPT-60D			RPT-6003					
	OUTPUT NUMBER	CH1	CH2	CH3	CH1	CH2	CH3			
OUTPUT	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	0.1 1.1/1	0.1 0.00/1	39.9W					
		52.25W			43.89W					
			450	00		00	00			
	RIPPLE & NOISE (max.) Note.3		150mVp-p	80mVp-p	80mVp-p	80mVp-p	80mVp-p			
	VOLTAGE TOLERANCE Note.4	-, _, _	±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								
	VOLTAGE RANGE	90 ~ 264VAC 127 ~ 370VDC								
	FREQUENCY RANGE	47 ~ 63Hz								
NDUT	EFFICIENCY (Typ.)	79% 75%								
NPUT	AC CURRENT (Typ.)	1.1A/115VAC 0.7A/230VAC								
	INRUSH CURRENT (Typ.)	COLD START 60A/230VAC 30A/115VAC								
	LEAKAGE CURRENT Note.5									
	LLANAGE CONNENT Note.5	0	-		00 μA/204VAC					
	OVERLOAD	115 ~ 150% rated output power								
PROTECTION		Protection type : Hiccup mode, recovers automatically after fault condition is removed								
	OVER VOLTAGE	CH1: 5.75 ~ 6.75V CH1: 3.8 ~ 4.45V								
		21	Protection type : Shut down o/p voltage, re-power on to recover							
	WORKING TEMP.	-20 ~ +65°C (Refer	to "Derating Curve'	")						
	WORKING HUMIDITY	20 ~ 90% RH non-condensing								
ENVIRONMENT	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	3 3000 meters								
SAFETY STANDARDS	SAFETY STANDARDS	IEC 60601-1:2005+A1+A2, TUV BS EN/ EN 60601-1:2006+A1+A12+A2, ANSI/AAMI ES60601-1:2005+A2,           CAN/CSA C22.2 No. 60601-1:2014+A2, IEC 62368-1:2014, UL 62368-1, 2nd Ed, CSA C22.2 No. 62368-1-14, 2nd Ed,           TUV BS EN/ EN 62368-1:2014+A11, EAC TP TC 004 approved           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.1/P-FG. O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH								
	IOULATION REDIDIAROE	Parameter	-1 0.1001010111137	Standard						
	EMC EMISSION						Class B			
		Conducted emission			BS EN/EN55011 (CISPR11)		Class B Class B			
		Radiated emission			BS EN/EN55011 (CISPR11)					
SAFETY &		Harmonic current			BS EN/EN61000-3-2		Class A			
EMC (Note 9)		Voltage flicker BS EN/EN610			10-3-3					
(NOLE 5)		BS EN/EN55035, BS EN/EN60601-1-2			Test Level / Note					
	EMC IMMUNITY	Parameter		Standard			ote			
		ESD		BS EN/EN610	BS EN/EN61000-4-2		Level 4, 15KV air ; Level 4, 8KV cont			
		RF field susceptibility		BS EN/EN610	BS EN/EN61000-4-3		Level 3, 10V/m( 80MHz~2.7GHz ) Table 9, 9~28V/m( 385MHz~5.78GHz )			
		EFT bursts		BS EN/EN610	00-4-4	Level 3. 2KV	Level 3, 2KV			
		Surge susceptibility		BS EN/EN610	BS EN/EN61000-4-5		Level 4, 4KV/Line-FG ; 2KV/Line-Line-Line-Line-Line-Line-Line-Line-			
		Conducted susce	•		BS EN/EN61000-4-6		Level 3, 10V			
		Magnetic field im			BS EN/EN61000-4-8		Level 3, 10V Level 4, 30A/m			
		Magnetic field fill	indinty	BOENEROID	0010		ds, 30% dip 25 periods,			
		Voltage dip, interruption BS EN/EN61000-4-17			100% interruptions 250 periods					
	MTBF	4415.3K hrs min. Telcordia SR-332 (Bellcore) ; 677.8K hrs min. MIL-HDBK-217F (25℃)								
OTHERS	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> <li>All parameters NOT specially</li> <li>33% Duty cycle maximum wil</li> <li>Ripple &amp; noise are measured</li> <li>Tolerance : includes set up to</li> <li>Touch current was measured</li> <li>The ambient temperature der</li> <li>Length of set up time is meas</li> <li>Heat Sink HS1, HS2 can not t</li> <li>The power supply is consider 360mm '360mm metal plate v</li> </ol>	thin every 30 seconds I at 20MHz of bandwico plerance, line regulation from primary input to rating of 3.5°C/1000m sured at cold first start be shorted. red a component whick with 1mm of thickness.	Average output po th by using a 12" tw n and load regulatio DC output. with fanless models . Turning ON/OFF th h will be installed int . The final equipmer	wer should not exceed isted pair-wire termina n. and of 5°C/1000m with he power supply may la to a final equipment. A ht must be re-confirme	d the rated power. ated with a 0.1 µf & 47/ th fan models for oper- lead to increase of the all the EMC tests are b d that it still meets EM	#f parallel capacitor. ating altitude higher that set up time. een executed by mouning directives. For guidar	ting the unit on a nee on how to perform the			
	8. Heat Sink HS1,HS2 can not b 9. The power supply is consider	be shorted. red a component which with 1mm of thickness. MI testing of compone	h will be installed int . The final equipmer ent power supplies."	o a final equipment. A nt must be re-confirme (as available on https:	Il the EMC tests are b d that it still meets EM //www.meanwell.com//	een executed by mound C directives. For guidar /Upload/PDF/EMI_state aspx	nce on how to			



# RPT-60 series





## RPT-60 series

## Mechanical Specification (Unit: mm, tolerance ± 1mm)



Side View

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

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

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

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

 $\pm$  : 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.

Installation Manual

Please refer to : http://www.meanwell.com/manual.html