NOT RECOMMENDED FOR NEW DESIGNS

Features

Regulated

Converter

- 60 Watt PCB mount package
- Universal input voltage range
- 4kVAC isolation
- Low output ripple and noise
- Short circuit protected
- Output trim
- UL certified, CE marked

Description

Power module for PCB mounting. This switching converter has a universal input voltage range with single outputs which are trimmable to compensate for any voltage drops on the output connections. Threaded inserts ensure mechanical fixing.



RAC60-B

60 Watt Single Output



Selection Guide							
Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	Max. Capacitive Load [μF]	Output Power max. [W]	
RAC60-05SB	85 - 265	5	10000	82	80000	50	
RAC60-09SB	85 - 265	9	6600	84	28000	60	
RAC60-12SB	85 - 265	12	5000	86	14000	60	
RAC60-15SB	85 - 265	15	4000	86	12000	60	
RAC60-24SB	85 - 265	24	2500	86	4000	60	
RAC60-48SB	85 - 265	48	1250	86	950	60	









Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Model Numbering



Ordering Examples:

RAC60-05SB 60 Watt 5Vout Single Output
RAC60-24SB 60 Watt 24Vout Single Output



UL60950-1 certified EN60950-1 certified CAN/CSA-C22.2 No. 60950-1 certified EN55032 compliant EN55024 compliant

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RAC60-B

Series

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS							
Parameter	Co	ndition	Min.	Тур.	Max.		
Input Voltage Range (2)	nom. Vin = 230VAC		85VAC 100VDC	230VAC	265VAC 370VDC		
Input Current	put Current 115VAC 230VAC				2A 1A		
Inrush Current 2	2ms max., cold start	115VAC 230VAC			30A 50A		
No load Power Consumption	115VAC/230VAC				520mW		
Input Frequency Range	A	C Input	47Hz		63Hz		
Output Voltage Trimming	please refer to Trim table		-10%		+10%		
Minimum Load			1%				
Hold-up Time	115VAC/230VAC		10ms				
Internal Operating Frequency				100kHz			
Output Ripple and Noise (3)	20MHz limited				% Vout + 50mVp-p % Vout + 40mVp-p		

Notes:

Note2: The products were submitted for safety files at AC-Input operation

Note3: Measurements are made with a 0.1µF and 47µF MLCC in parallel across output (low ESR)

Output Voltage Trimming

It allows the user to increase or decrease the output voltage of the module. This is accomplished by connecting an external resistor between the Trim pin and either the +Vout or -Vout pins. With an external resistor between the Trim and -Vout pin, the output voltage increases. With an external resistor between the Trim and +Vout pin, the output voltage decreases. The values for trim resistors shown in trim tables below, the specified percentage may slightly vary.

5V0	out	9V	out	12\	/out	15\	/out	24\	/out	48\	/out	
+10	100	+10	100	+10	100	+10	100	+10	100	+10	100	[%]
500	1M	6k	1M	4k	1M	5k	1M	12k	1M	12k	1M	[Ω]
5V	out	9V	out	12\	/out	15\	/out	24\	/out	48\	/out	
100	-10	100	-10	100	-10	100	-10	100	-10	100	-10	[%]
1M	500	1M	20k	1M	40k	1M	60k	1M	110k	10M	290k	[Ω]
	+10 500 5V	500 1M 5Vout 100 -10	+10 100 +10 500 1M 6k 5Vout 9V 100 -10 100	+10 100 +10 100 500 1M 6k 1M 5Vout 9Vout 100 -10 100 -10	+10 100 +10 100 +10 500 1M 6k 1M 4k 5Vout 9Vout 12V 100 -10 100 -10 100	+10 100 +10 100 +10 100 500 1M 6k 1M 4k 1M 5Vout 9Vout 12Vout 100 -10 100 -10	+10 100 +10 100 +10 100 +10 500 1M 6k 1M 4k 1M 5k 5Vout 9Vout 12Vout 15Vout 15Vout 100 -10 100 -10 100	+10 100 +10 100 +10 100 500 1M 6k 1M 4k 1M 5k 1M 5Vout 9Vout 12Vout 15Vout 15Vout 100 -10 100 -10 </td <td>+10 100 +10 100 +10 100 +10 100 +10 500 1M 6k 1M 4k 1M 5k 1M 12k 5Vout 9Vout 12Vout 15Vout 24V 100 -10 100 -10 100 -10 100</td> <td>+10 100 +10 100 +10 100 +10 100 +10 100 500 1M 6k 1M 4k 1M 5k 1M 12k 1M 5Vout 9Vout 12Vout 15Vout 24Vout 100 -10 100 -10 100 -10</td> <td>+10 100 +10 100 +10 100 +10 100 +10 100 +10 500 1M 6k 1M 4k 1M 5k 1M 12k 1M 12k 5Vout 9Vout 12Vout 15Vout 24Vout 48V 100 -10 100 -10 100 -10 100</td> <td>+10 100 -10 100 -10</td>	+10 100 +10 100 +10 100 +10 100 +10 500 1M 6k 1M 4k 1M 5k 1M 12k 5Vout 9Vout 12Vout 15Vout 24V 100 -10 100 -10 100 -10 100	+10 100 +10 100 +10 100 +10 100 +10 100 500 1M 6k 1M 4k 1M 5k 1M 12k 1M 5Vout 9Vout 12Vout 15Vout 24Vout 100 -10 100 -10 100 -10	+10 100 +10 100 +10 100 +10 100 +10 100 +10 500 1M 6k 1M 4k 1M 5k 1M 12k 1M 12k 5Vout 9Vout 12Vout 15Vout 24Vout 48V 100 -10 100 -10 100 -10 100	+10 100 -10 100 -10

REGULATIONS						
Parameter	Condition	Value				
Output Accuracy		±2.0% max.				
Line Regulation	low line to high line, full load	±1.0% typ.				
Load Regulation (4)	5% to 100% load	1.0% typ.				

Notes:

Note4: Operation below 5% load will not harm the converter, but specifications may not be met

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RAC60-B

Series

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

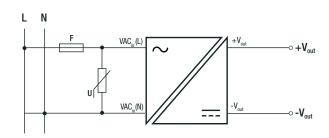
PROTECTIONS			
Parameter		Туре	Value
Short Circuit Protection (SCP)			continuous, hiccup, auto recovery
Over Voltage Protection (OVP)			zener diode clamp
Over Current Protection (OCP)			auto recovery
Over Voltage Category			OVCII
Isolation Voltage	I/P to O/P	tested for 1 minute	4kVAC
Isolation Resistance			100M Ω max.
Leakage Current			0.5mA max.

Notes:

Note5: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

Note6: An external MOV is recommended. The varistor should comply with IEC-61051-2. e.g. 14S471K series

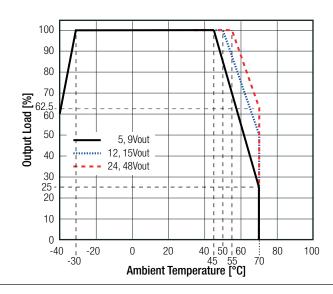
Protection Circuit



ENVIRONMENTAL							
Parameter		Condition		Value			
			5, 9Vout	-30°C to +45°C			
Operating Temperature Range	@ natural convection	full load	12, 15Vout	-30°C to +50°C			
	0.1m/s		24, 48Vout	-30°C to +55°C			
		refer to derating graph		-40°C to +70°C			
Temperature Coefficient				0.02%/K typ.			
Operating Altitude				2000m			
Pollution Degree				PD2			
MTBF	according to MIL-	HDBK-217F, G.B.	+25°C	>300 x 10 ³ hours			

Derating Graph

(@ Chamber and natural convection 0.1 m/s)





RAC60-B

Series

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 2nd Edition, 2007 CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2007
Information Technology Equipment, General Requirements for Safety		EN60950-1:2006 + A2:2013
EAC Safety of Low Voltage Equipment	RU-AT.49.09571	TP TC 004/2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863
EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55032:2015
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
Limitation of voltage fluctuations/flicker in low-voltage systems		EN61000-3-3: 2013

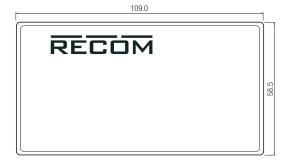
DIMENSION AND PHYSICAL CHARACTERISTICS							
Parameter	Туре	Value					
Material	case	epoxy with fibreglas, (UL94V-0)					
Dimension (LxWxH)		109.0 x 58.5 x 30.0mm					
Weight		310g typ.					

Dimension Drawing (mm)

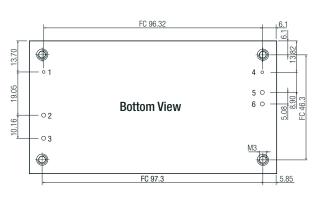




PA-4







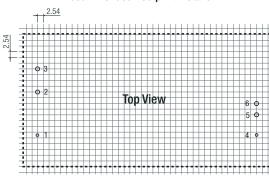
Pinning information

Pin#	Single	Dia. (mm)
1	FG	1.2
2	VAC in (L)	1.8
3	VAC in (N)	1.8
4	Trim	1.2
5	-VDC out	1.8
6	+VDC out	1.8

 $\begin{aligned} \text{FC} &= \text{Fixing Centers} \\ \text{Tolerance:} \quad & \text{xx.x} \pm 0.5 \text{mm} \\ & \text{xx.xx} \pm 0.25 \text{mm} \end{aligned}$



Recommended Footprint Details



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Series

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PACKAGING INFORMATION							
Parameter	Туре	Value					
Packaging Dimension (LxWxH)	cardboard box	120.0 x 65.0 x 55.0mm					
Packaging Quantity		1pcs					
Storage Temperature Range		-50°C to +85°C					
Storage Humidity	non-condensing	95% RH max.					

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