

# Features

# Regulated Converter

- Universal Input 85-305VAC
- 3W PCB Mount Package
- <75mW No Load Power Consumption
- Ultra Low Profile, Compact Size
- -40°C to +85°C Operating Temperature
- Continuous SCP, OCP, OVP
- EN60950, UL60950 & CE Pending, EN55032 Class B

## Description

The RAC03-GB series are low cost AC/DC power supplies, ideal for PCB mounted, compact, board level industrial applications. They feature universal AC input voltage range, regulated and short-circuit -proof isolated DC outputs, low standby power consumption and -40°C to +85°C operating temperature range. The RAC03-GB have a built-in Class B / FCC Part 15 EMC filter, are pending to EN60950 and EN62368 safety standards and come with a three year warranty.

## Selection Guide

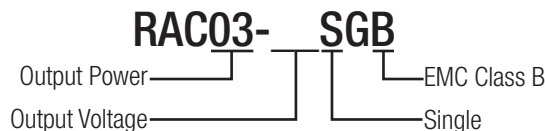
Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	Max. Capacitive Load <sup>(2)</sup> [μF]
RAC03-05SGB	85-305	5	600	72	1500
RAC03-12SGB	85-305	12	250	78	500
RAC03-24SGB	85-305	24	130	80	150

### Notes:

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

Note2: Max. Cap. Load is tested at nominal input and full resistive load

## Model Numbering



### Ordering Example

RAC03-12SGB = 3W Output Power, 12V Output Voltage, Single Output, EMC Class B

## Specifications (measured @ ta=25°C, nom. Vin, full load unless otherwise noted)

BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				Pi-Type
Input Voltage Range		85VAC 120VDC		305VAC 430VDC
Input Current	115VAC 230VAC		70mA 45mA	
Inrush Current	cold start at 25°C 115VAC 230VAC			10A 20A
No Load Power Consumption				75mW
Input Frequency Range	AC Input	45Hz		65Hz
Minimum Load		0%		
Power Factor	115VAC 230VAC		0.53 0.41	
Start-up Time	115VAC, 230VAC		30ms	1s
Hold-up Time	115VAC 230VAC		5ms 40ms	
Internal Operating Frequency	100% load at nominal Vin		65kHz	

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## RAC03-GB

# 3 Watt Single Output EMC Class B



UL60950-1 Pending  
IEC/EN60950-1 Pending  
UL62368-1 Pending  
IEC/EN62368-1 Pending

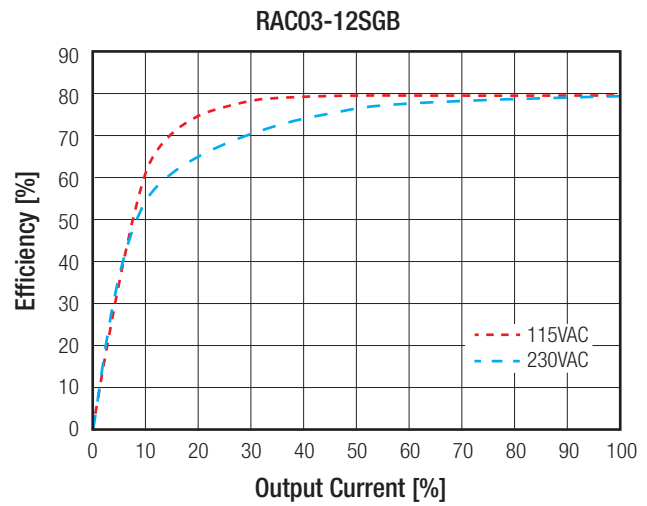
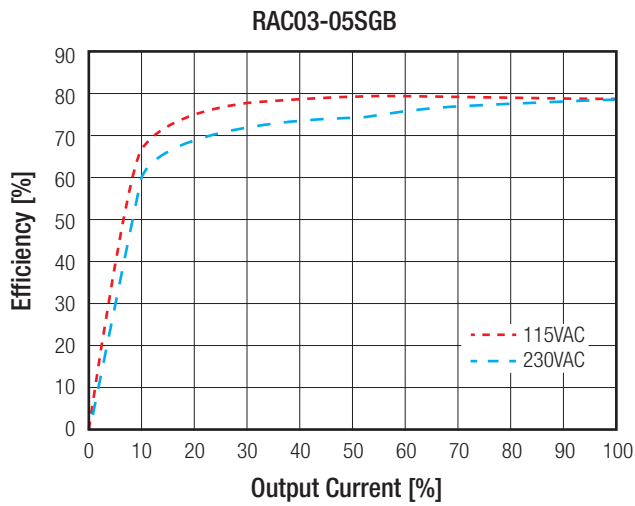
### Specifications (measured @ $t_a=25^\circ\text{C}$ , nom. $V_{in}$ , full load unless otherwise noted)

Output Ripple and Noise <sup>③</sup>	20MHz BW	0°C to 85°C	5Vout 12Vout 24Vout		100mVp-p 150mVp-p 240mVp-p
		-30°C to 0°C	5Vout 12Vout 24Vout		200mVp-p 250mVp-p 300mVp-p

#### Notes:

Note3: Measurements are made with a 12" twisted pair-wire with a 0.1 $\mu\text{F}$  and 10 $\mu\text{F}$  parallel capacitor across output (low ESR).

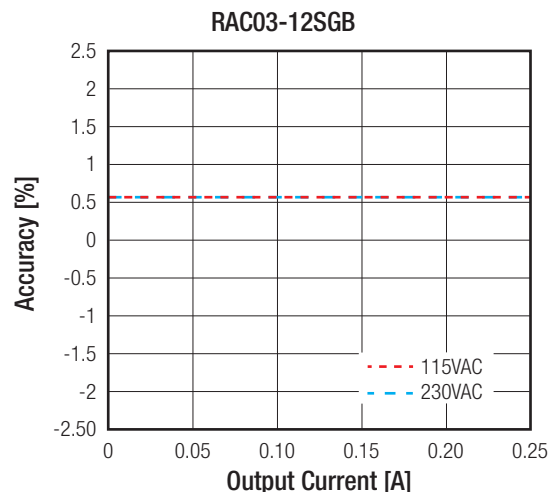
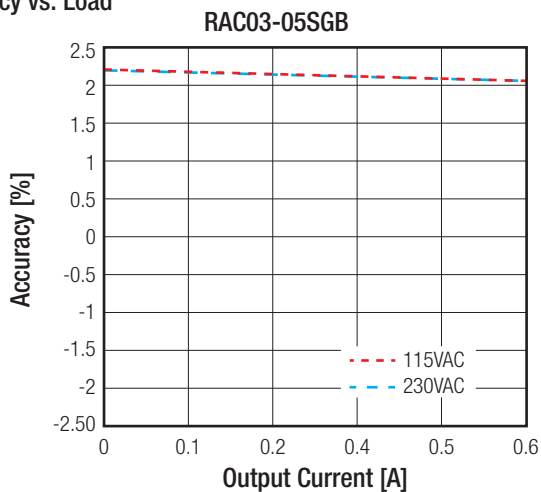
#### Efficiency vs. Load



#### REGULATIONS

Parameter	Condition	Value
Output Accuracy		$\pm 2.5\%$ max.
Line Regulation	low line to high line	$\pm 0.5\%$ max.
Load Regulation	10% to 100% load	$\pm 0.5\%$ max.

#### Accuracy vs. Load



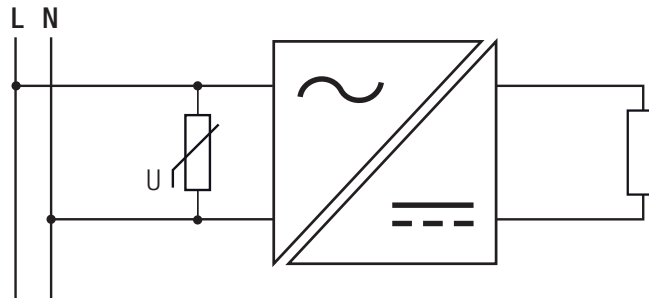
**Specifications** (measured @  $t_a=25^{\circ}\text{C}$ , nom.  $V_{in}$ , full load unless otherwise noted)

PROTECTIONS		
Parameter	Type	Value
Input Fuse	internal	T1A, 300V
Short Circuit Protection (SCP)	below 100m $\Omega$	long-term mode, auto recovery
Over Voltage Protection (OVP)	5Vout	5.3V - 6.8V, hiccup mode auto recovery
	12Vout	12.6V - 16.2V, hiccup mode auto recovery
	24Vout	25.2V - 32.4V, hiccup mode auto recovery
Over Current Protection (OCP)	5Vout	0.91A - 2.2A, hiccup mode auto recovery
	12Vout	0.37A - 0.95A, hiccup mode auto recovery
	24Vout	0.19A - 0.45A, hiccup mode auto recovery
Over Voltage Category (OVC)		OVC II
Isolation Voltage <sup>(4)</sup>	I/P to O/P	rated for 1 minute
Isolation Resistance		10M $\Omega$ min.
Isolation Capacitance		800pF min., 1200pF max.
Insulation Grade		Double
Leakage Current	277VAC, 50Hz	0.1mA max.

**Notes:**

Note4: For repeat Hi-Pot testing, reduce the time and/or the test voltage.

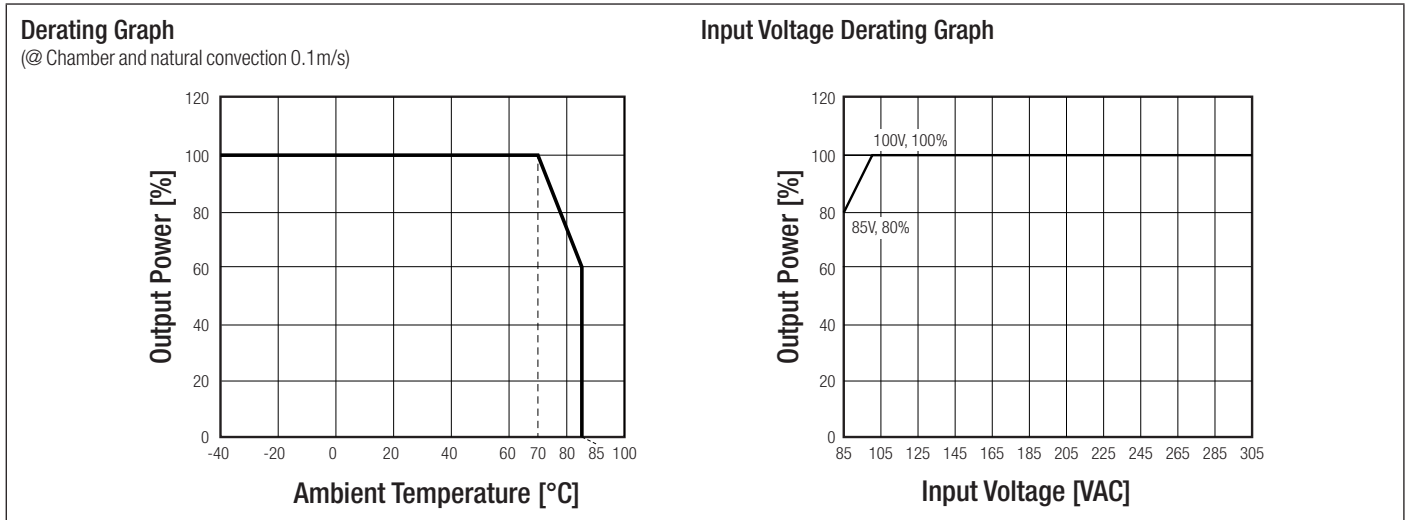
Note5: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC61051-2. eg. EPCOS S14 series.



ENVIRONMENTAL			
Parameter	Condition	Value	
Operating Temperature Range	without derating (@ natural convection 0.1m/s, see graph)	-40°C to +70°C	
Maximum Case Temperature		+100°C	
Temperature Coefficient		±0.03%/°C	
Operating Altitude		3000m	
Operating Humidity	non-condensing	5% - 95% RH	
Pollution Degree		PD2	
Shock		20G/11ms pulse, 3 times at each x, y, z axes	
Vibration		10-150Hz, 2G 10min./1cycle, period 60min. along x,y,z axes for 6 cycles	
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	100 x 10 <sup>3</sup> hours
		+70°C	100 x 10 <sup>3</sup> hours

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**Specifications** (measured @  $t_a=25^\circ\text{C}$ , nom.  $V_{in}$ , full load unless otherwise noted)



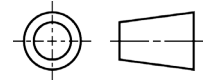
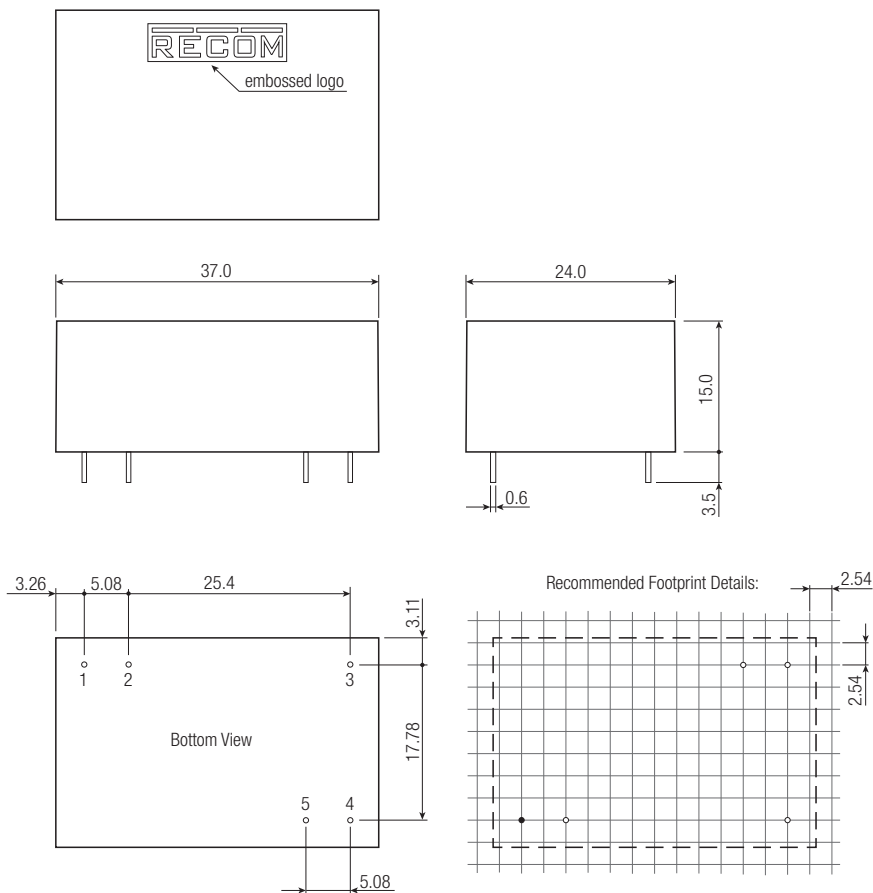
SAFETY AND CERTIFICATIONS PENDING		
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety (LVD)		IEC60950-1 EN60950-1
Information Technology Equipment, General Requirements for Safety		UL60950-1 CAN/CSA C22.2 No. 60950-1-07
Audio/video, information and communication technology equipment. Safety requirements		UL62368-1 CAN/CSA C22.2 No 62368-1
Audio/video, information and communication technology equipment. Safety requirements		IEC62368-1 EN62368-1
RoHs 2+		RoHs 10/10, 2015
EMC Compliance	Condition	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement		EN55032, Class B
Limitations on the amount of electromagnetic interference allowed from digital and electronic devices		FCC Part 15
ESD Electrostatic discharge immunity test		EN61000-4-2, Criteria B
Radiated, radio-frequency, electromagnetic field immunity test		EN61000-4-3, Criteria A
Fast Transient and Burst Immunity		EN61000-4-4, Criteria B
Surge Immunity		EN61000-4-5, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields		EN61000-4-6, Criteria A
Power Magnetic Field Immunity		EN61000-4-8, Criteria B
Voltage Dips and Interruption		EN61000-4-11

DIMENSION and PHYSICAL CHARACTERISTICS		
Parameter	Type	Value
Material	Case	black plastic, (UL94 V-0)
	PCB	FR4, (UL94 V-0)
Package Dimension (LxWxH)		37.0 x 24.0 x 15.0mm
Package Weight		20g typ.

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**Specifications** (measured @  $t_a=25^\circ\text{C}$ , nom.  $V_{in}$ , full load unless otherwise noted)

**Dimension Drawing (mm)**



**Pin Connections**

Pin #	Single
1	VAC in (L)
2	VAC in (N)
3	NC
4	-Vout
5	+Vout

Tolerance: XX.X  $\pm 0.5\text{mm}$   
Pin Width: XX.X  $\pm 0.05\text{mm}$

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	505.0 x 39.7 x 23.2mm
Packaging Quantity		20pcs
Storage Temperature Range		-40°C to +100°C
Storage Humidity	non-condensing	5% - 95% RH max.

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