

# Features

# Regulated Converter

- Universal Input 85-264VAC
- 1W PCB Mount Package
- <250mW No Load Power Consumption
- Ultra Low Profile, Compact Size
- -25°C to +80°C Operating Temperature
- Continuous SCP, OPP, OCP
- UL & CE Pending, EN/IEC60950 & IEC/EN62368 Certified



# RAC01-GB

1 Watt



Single Output  
EMC Class B

## Description

The RAC01-GB series are low cost AC/DC power supplies, ideal for PCB mounted, compact, board level industrial power supplies. They feature universal AC input voltage range, regulated and short-circuit-proof isolated DC outputs, low standby power consumption and -25°C to +80°C operating temperature range. The RAC01-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	nom. Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. [%]	Max. Capacitive Load <sup>(1)</sup> [µF]
RAC01-05SGB	100-240	5	200	63	500
RAC01-12SGB	100-240	12	83	68	200

**Notes:**

Note1: measured with all input voltages at 25°C with constant resistant mode at full load.



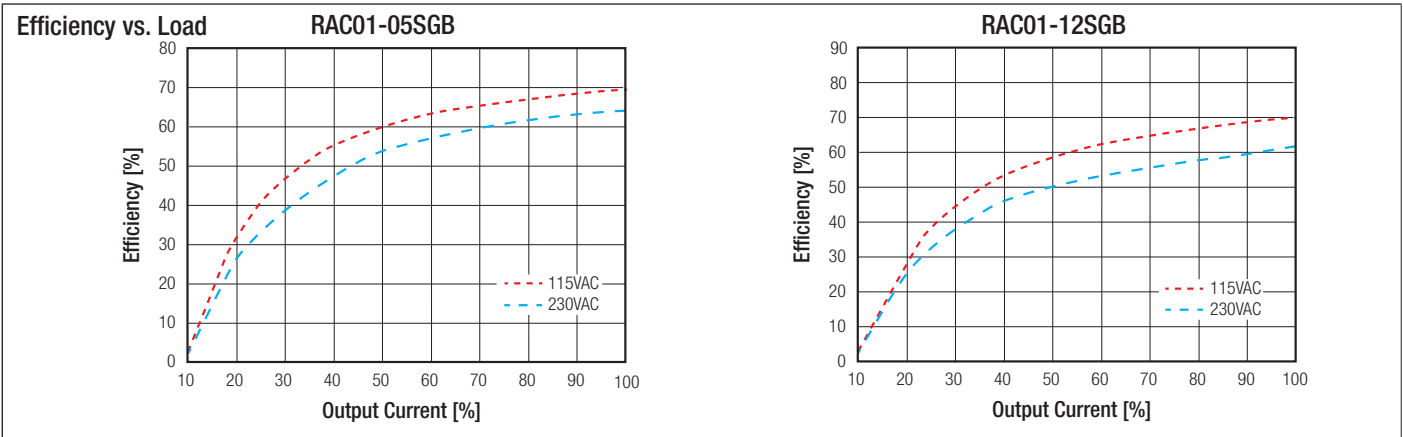
## Specifications (measured @ ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter					Pi-Type
Input Voltage Range <sup>(2)</sup>			85VAC	230VAC	264VAC
Input Current	115VAC 230VAC			25mA 18mA	
Inrush Current	cold start at 25°C	115VAC 230VAC			30A 40A
No load Power Consumption				180mW	250mW
Input Frequency Range	AC Input		47Hz		63Hz
Start-up Time	115VAC 230VAC			250ms 200ms	2s 2s
Hold-up time	115VAC 230VAC				18ms 80ms
Minimum Load			0%		
Internal Operating Frequency	100% load at nominal Vin			65kHz	
Output Ripple and Noise	5Vout	0 °C ... 80°C -25°C ... 0°C			100mVp-p 200mVp-p
	12Vout	0 °C ... 80°C -25°C ... 0°C			200mVp-p 300mVp-p
Power Factor	115VAC 230VAC			0.5 0.38	
<p><b>Notes:</b></p> <p>Note2: no proper operation with DC Input Voltage.</p> <p style="text-align: center;">continued on next page</p>					



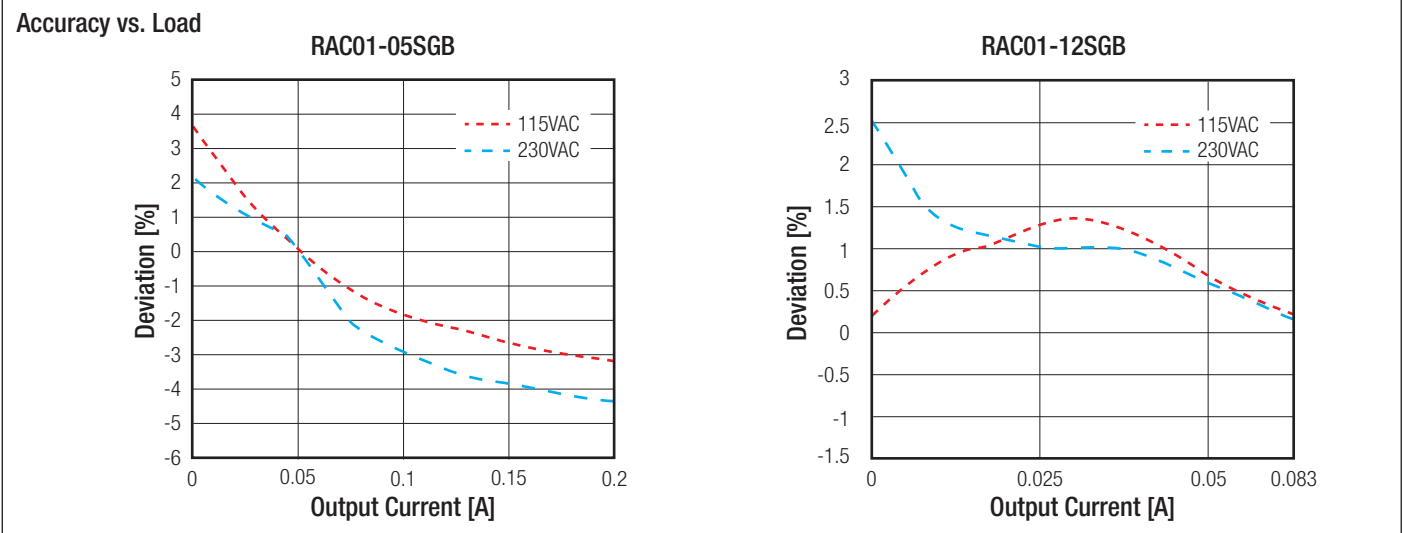
UL60950-1 Pending  
IEC/EN60950-1 Certified  
UL62368-1 Pending  
IEC/EN62368-1 Certified

**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage (115/230VAC), full load and after warm-up)



## REGULATIONS

Parameter	Condition	Value
Output Accuracy	$-25^\circ\text{C}$ to $+80^\circ\text{C}$	$\pm 6.0\%$ max.
Line Regulation	$-25^\circ\text{C}$ to $+80^\circ\text{C}$	$\pm 2.0\%$ max.
Load Regulation	$-25^\circ\text{C}$ to $+80^\circ\text{C}$	$\pm 6.0\%$ max.



## PROTECTIONS

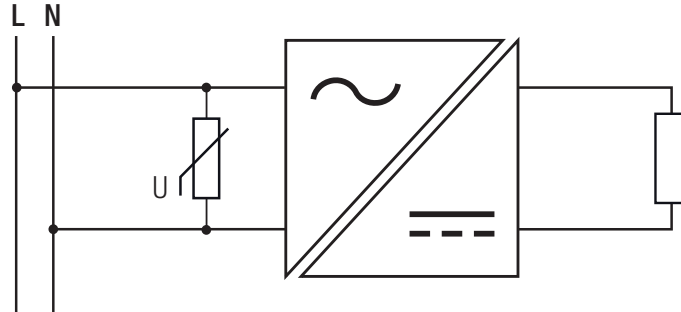
Parameter	Type	Value
Input Fuse	internal	10 $\Omega$ /1W
Short Circuit Protection (SCP)	below 100mW	continuous, auto recovery
Over Power Protection (OPP)	5Vout	1.1W - 2.5W, hiccup mode, auto recovery
	12Vout	1.1W - 3.0W, hiccup mode, auto recovery
Over Current Protection (OCP)	5Vout	0.22A - 0.5A, hiccup mode
	12Vout	0.91A - 0.25A, hiccup mode
Over Voltage Category (OVC)		OVC II
Isolation Voltage	I/P to O/P	rated for 1min
Isolation Resistance		100M $\Omega$ min.
Isolation Capacitance		1nF
Insulation Grade		Double
Leakage Current	I/P to O/P	0.25mA max.

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**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage (115/230VAC), full load and after warm-up)

**Notes:**

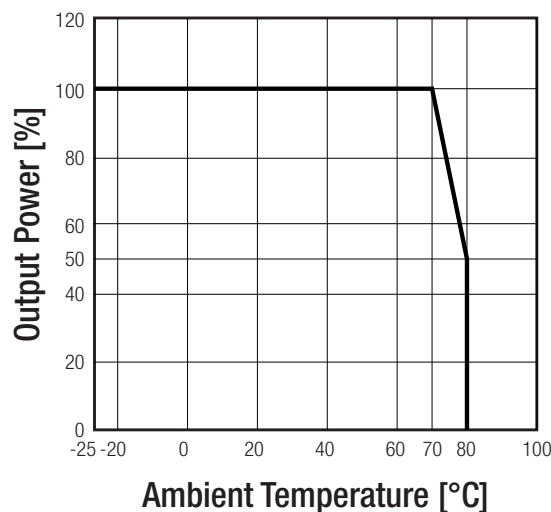
Note3: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 series



ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range <sup>(4)</sup>		-25°C to +70°C
Maximum Case Temperature		+120°C
Temperature Coefficient		±0.03%/°C
Operating Humidity	non-condensing	5% - 90% RH
Pollution Degree		PD2
Vibration		10-150Hz, 2G 10min./1cycle, period 60min. each along x,y,z axes
Shock		20G/11ms pulse, 3 times at each x, y, z axes
MTBF	according to MIL-HDBK-217F, G.B. +25°C +70°C	1691 x 10 <sup>3</sup> h 424 x 10 <sup>3</sup> h

**Derating Graph**

(@ Chamber and natural convection 0.1m/s)



**Notes:**

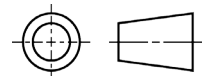
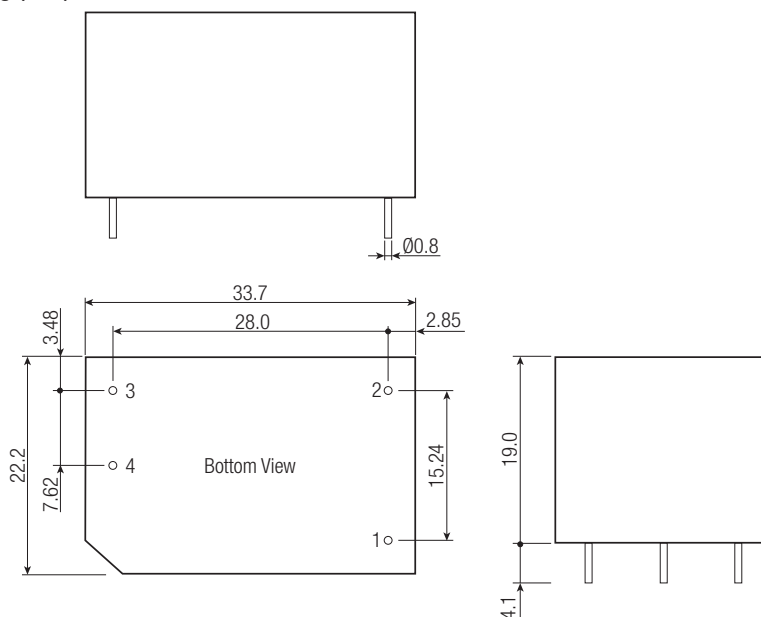
Note4: UL Report certified temperature range: -25°C to +70°C. According to RECOM internal qualification the device is rated up to +80°C with derating.

**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage (115/230VAC), full load and after warm-up)

SAFETY AND CERTIFICATIONS (pending)		
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety (CB)	16BAS1004811	IEC60950-1, 2nd Edition, 2005 + AM2, 2013 EN60950-1, 1st Edition, 2006 + AM2, 2013
Information Technology Equipment, General Requirements for Safety	pending	UL60950-1, 2nd Edition CAN/CSA C22.2 No. 60950-1-07, 2nd Edition
Audio/video, information and communication technology equipment. Safety requirements	pending	UL62368-1, 2nd Edition CAN/CSA C22.2 No 62368-1, 2nd Edition
Audio/video, information and communication technology equipment. Safety requirements	16BCS1004811	IEC62368-1, 2nd Edition, 2014 EN62368-1, 1st Edition, 2014
RoHs 2+		RoHs 2011/65/EU + AM2015/863
EMC Compliance		
Condition	Standard / Criterion	
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement		EN55022, Class B
Limitations on the amount of electromagnetic interference allowed from digital and electronic devices		47 CFR FCC Part 15, Subpart B 2016, Class A & B
ESD Electrostatic discharge immunity test	Air $\pm 8\text{kV}$ , Contact $\pm 4\text{kV}$	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	$\pm 1\text{kV}$	EN61000-4-4, Criteria B
Surge Immunity	$\pm 1\text{kV}$	EN61000-4-5, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	3V	EN61000-4-6, Criteria A
Voltage Dips and Interruption	Voltage Dips >95%	EN61000-4-11, Criteria A
	Voltage Dips 30%	EN61000-4-11, Criteria B
	Voltage Interruptions >95%	EN61000-4-11, Criteria B

DIMENSION and PHYSICAL CHARACTERISTICS		
Parameter	Type	Value
Material	Case PCB	black plastic, (UL94 V-0) FR4, (UL94 V-0)
Package Dimension (LxWxH)		33.7 x 22.2 x 19.0mm
Package Weight		12g typ.

### Dimension Drawing (mm)



### Pin Connections

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

Tolerance: xx.x=  $\pm 0.5\text{mm}$   
Pin width:  $\pm 0.05\text{mm}$

**Specifications** (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage (115/230VAC), full load and after warm-up)

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	470.0 x 36.4 x 26.4mm
Packaging Quantity		20pcs
Storage Temperature Range		-25°C to +85°C
Storage Humidity	non-condensing	5%-95% RH max.

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