

# Features

- Universal input 85-264VAC
- <250mW No load power consumption
- Class II installations (without FG)
- -25°C to +80°C Operating temperature, with derating
- Continuous SCP, OCP
- IEC/EN60950 & IEC/EN/UL62368 certified

# Regulated Converter



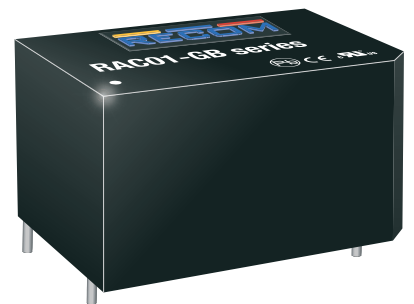
## RAC01-GB

**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 applications. 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 certified 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 [%]	Max. Capacitive Load <sup>(1)</sup> [µF]
RAC01-3.3SGB	85-264	3.3	303	63	500
RAC01-05SGB	85-264	5	200	63	500
RAC01-12SGB	85-264	12	83	68	200
RAC01-24SGB	85-264	24	42	63	200

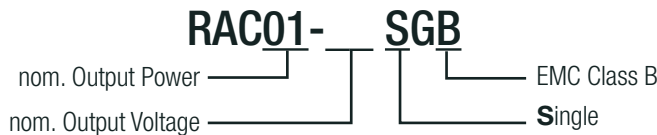
#### Notes:

Note1: Measured with all input voltages at +25°C with constant resistant mode at full load



ULIEC/EN60950-1 certified  
 UL/IEC/EN62368-1 certified  
 CAN/CSA-C22.2 No. 62368 certified  
 IEC/EN62368-1 certified  
 CB Report

### Model Numbering



#### Ordering Examples:

RAC01-12SGB    12Vout    Single Output    EMC Class B

**Specifications** (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

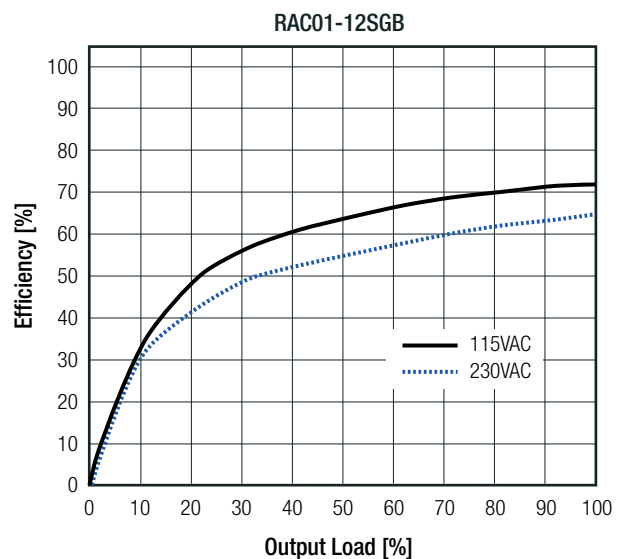
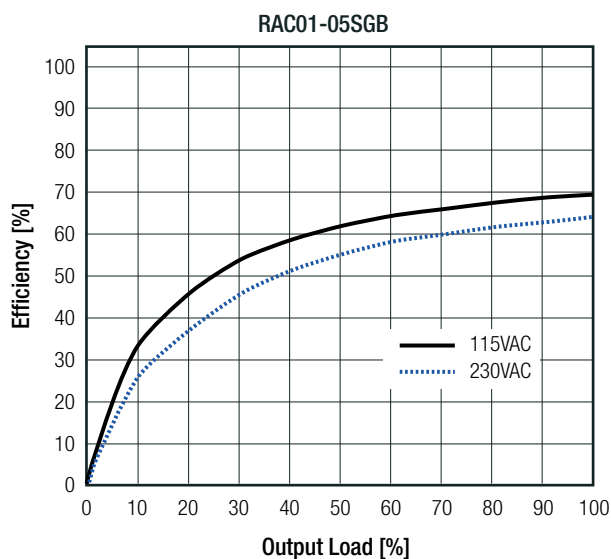
**BASIC CHARACTERISTICS**

Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter			Pi-type		
Input Voltage Range <sup>(2,3,4)</sup>	nom. Vin = 230VAC		85VAC	230VAC	264VAC
Input Current	115VAC 230VAC			25mA 18mA	30mA 20mA
Inrush Current	cold start at +25°C	115VAC 230VAC			30A 40A
No load Power Consumption				180mW	250mW
Input Frequency Range			47Hz		63Hz
Minimum Load			0%		
Power Factor	115VAC 230VAC			0.5 0.38	
Start-up Time	115VAC 230VAC			250ms 200ms	2s 2s
Hold-up time	115VAC 230VAC				20ms 80ms
Internal Operating Frequency	100% load at nominal Vin			65kHz	
Output Ripple and Noise	20MHz BW	0°C to 80°C	3.3Vout 5Vout 12Vout 24Vout		100mVp-p 100mVp-p 200mVp-p 240mVp-p
		-25 °C to 0°C	3.3Vout 5Vout 12Vout 24Vout		200mVp-p 200mVp-p 300mVp-p 300mVp-p

**Notes:**

- Note2: No proper operation with DC input voltage
- Note3: The products were submitted for safety files at AC-Input operation
- Note4: Refer to **"Line Derating"**

**Efficiency vs. Load**

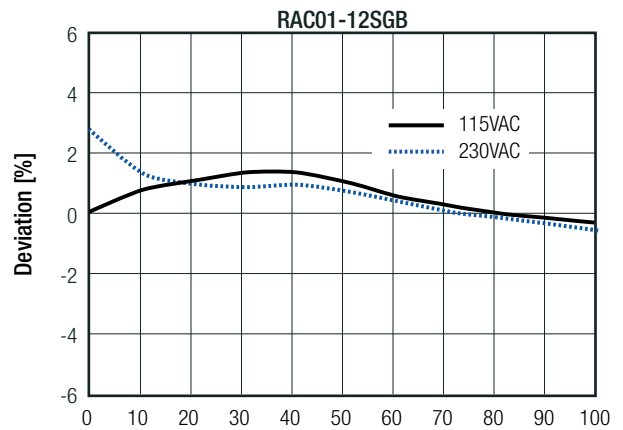
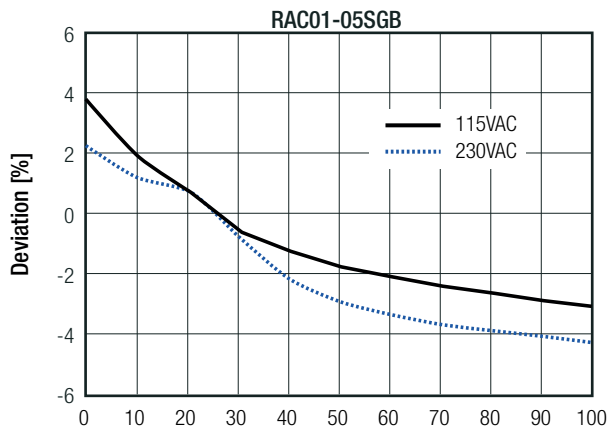


**Specifications** (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

**REGULATIONS**

Parameter	Condition	Value
Output Accuracy	-25°C to +80°C	±6.0% max.
Line Regulation	-25°C to +80°C	±2.0% max.
Load Regulation	-25°C to +80°C	6.0% max.

**Deviation vs. Load**



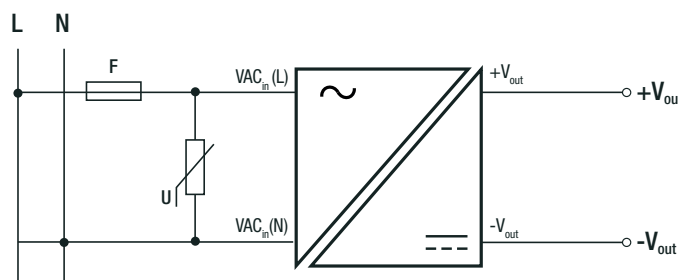
**PROTECTIONS**

Parameter	Type	Value	
Input Fuse <sup>(5)</sup>	internal	fusible resistor, 1Ω/1W	
Short Circuit Protection (SCP)	below 100mΩ	continuous, auto recovery	
Over Voltage Category		OVCII	
Over Current Protection (OCP)	3.3Vout 5Vout 12Vout 24Vout	0.33A - 0.60A 0.22A - 0.50A 0.09A - 0.25A 0.05A - 0.14A	hiccup mode
Class of Equipment		Class II	
Isolation Voltage <sup>(6)</sup>	I/P to O/P	rated for 1 minute	3kVAC
Isolation Resistance			100MΩ min.
Isolation Capacitance			1nF
Insulation Grade			reinforced
Leakage Current	I/P to O/P		0.25mA max.

**Notes:**

- Note5: Refer to local safety regulations if input over-current protection is also required
- Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage
- Note7: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 series

**Protection Circuit**



**Specifications** (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

**ENVIRONMENTAL**

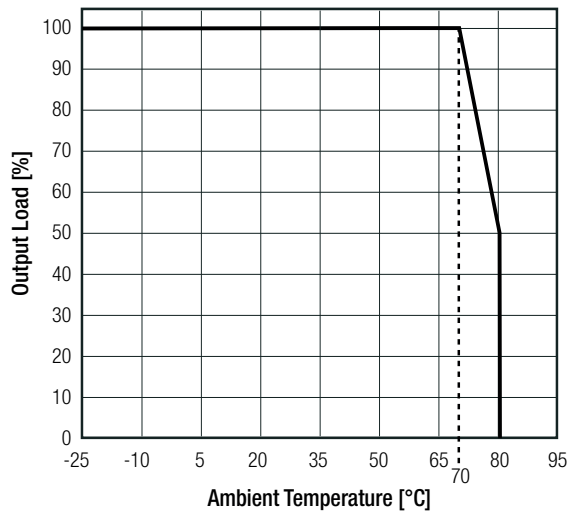
Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/s	full load	-25°C to +70°C
		refer to <b>"Derating Graph"</b>	-25°C to +80°C
Maximum Case Temperature			+120°C
Temperature Coefficient			0.03%/K
Operating Altitude <sup>(8)</sup>			4000m
Operating Humidity	non-condensing		10% - 95% RH max.
Pollution Degree			PD2
Shock			10-150Hz, 2G 10min./1cycle, period 60min. each along x,y,z axes
Vibration	according to MIL-STD-202G		20G/11ms pulse, 3 times at each x, y, z axes
MTBF <sup>(9)</sup>	according to MIL-HDBK-217F, method 2	+25°C	1691 x 10 <sup>3</sup> hours
		+70°C	424 x 10 <sup>3</sup> hours

**Notes:**

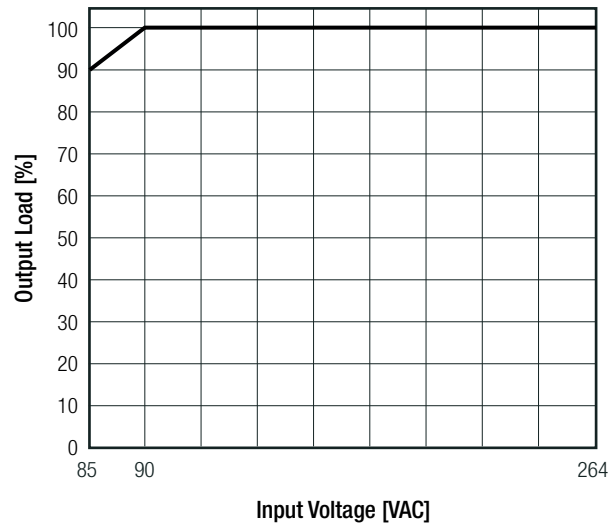
- Note8: Recognized by UL for safe operation up to 4000m. High altitude operation may impact the performance and lifetime. Contact TechsupportAT@RECOM-POWER.com for advice
- Note9: Based on calculation for 5Vout

**Derating Graph**

(@ Chamber and natural convection 0.1m/s)



**Line Derating**



**SAFETY AND CERTIFICATIONS**

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	SA1804152L01001	IEC60950-1:2005 2nd Edition + Am2:2013 EN60950-1:2006 + A12:2011 + A2:2013
Audio/Video, information and communication technology equipment - Part1: Safety requirements	E196683-A5 and E19668-A6001	UL62368-1, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14
Audio/Video, information and communication technology equipment - Part1: Safety requirements (CB Scheme)	SA1804152S 001	IEC62368-1:2014 2nd Edition
Audio/Video, information and communication technology equipment - Part1: Safety requirements		EN62368-1:2014+A11:2017
RoHS2		RoHS 2011/65/EU + AM2015/863

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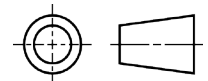
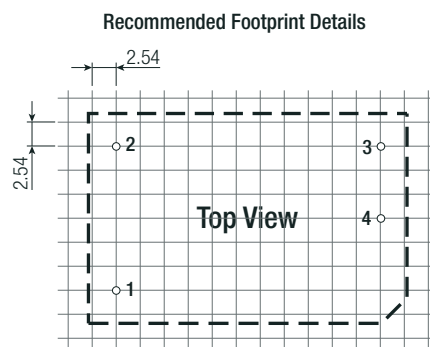
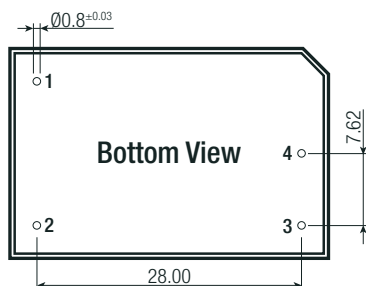
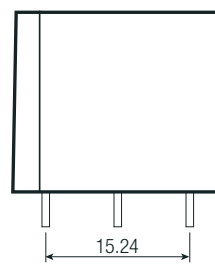
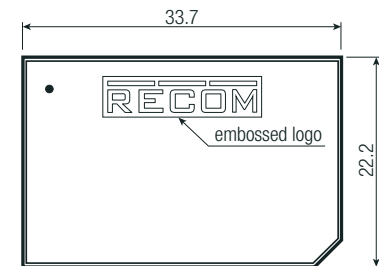
**Specifications** (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	EA1804152E 01001	EN55032, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD Electrostatic discharge immunity test	Air ±2, 4, 8kV Contact ±2, 4kV	EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1.0kV	EN61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port: L-N ±1.0kV	EN61000-4-5:2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port 3V	EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	EN61000-4-8:2009, Criteria A
Voltage Dips and Interruption	Voltage Dips >95%	EN61000-4-11:2004, Criteria A
	Voltage Dips 30%	EN61000-4-11:2004, Criteria B
	Voltage Interruptions >95%	EN61000-4-11:2004, Criteria B
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

### DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case PCB	black plastic (UL94V-2) FR4 (UL94V-0)
Dimension (LxWxH)		33.7 x 22.2 x 19.0mm
Weight		12g typ.

#### Dimension Drawing (mm)



#### Pin Connections

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

Tolerance:  
Pin length: -0.5/+0.9  
xx.x= ±0.5mm  
x.xx= ±0.25mm

**Specifications** (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

### 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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