Features

Regulated Converter

- 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

RECOM
AC/DC 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 (1) [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

RAC01-__ SGB

- nom. Output Power
- nom. Output Voltage
- EMC Class B
- **S**ingle

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 (2,3,4)	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:

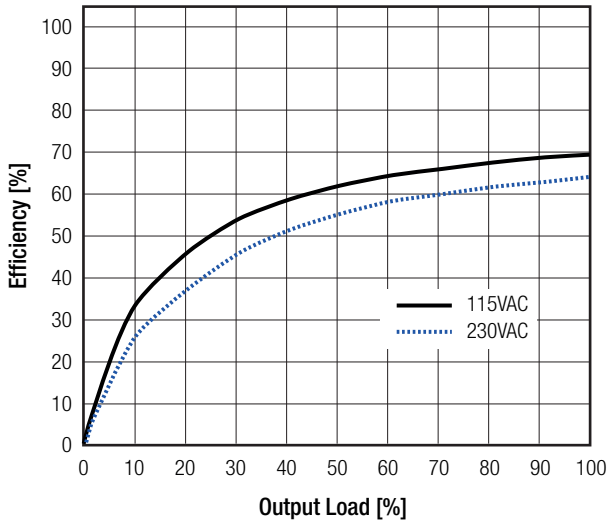
Note2: No proper operation with DC input voltage

Note3: The products were submitted for safety files at AC-Input operation

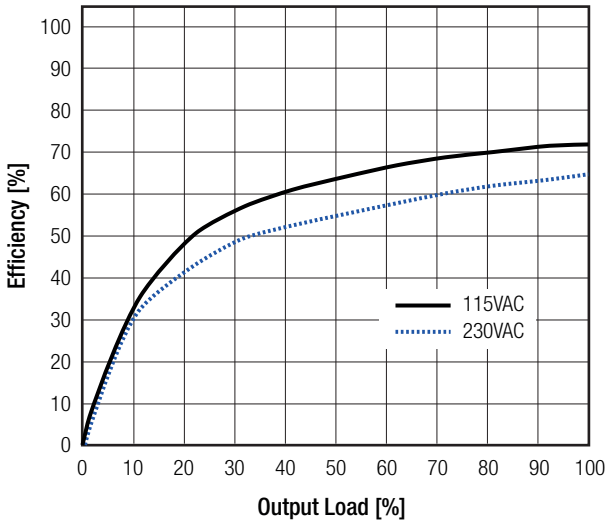
Note4: Refer to line derating graph on page 4

Efficiency vs. Load

RAC01-05SGB



RAC01-12SGB

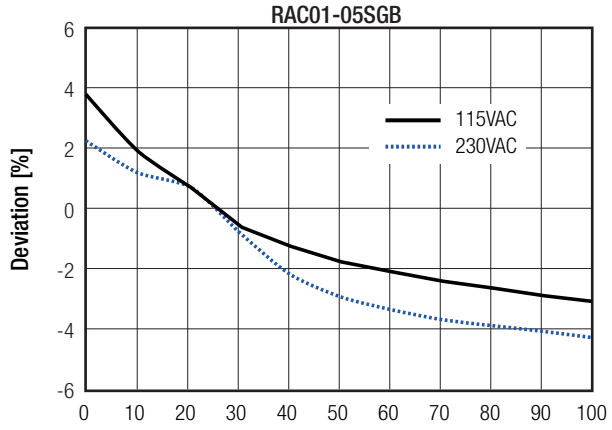


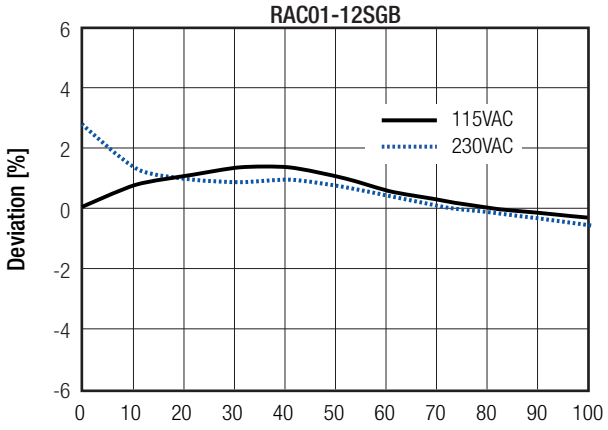
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

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 (5)	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 (6)	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.	

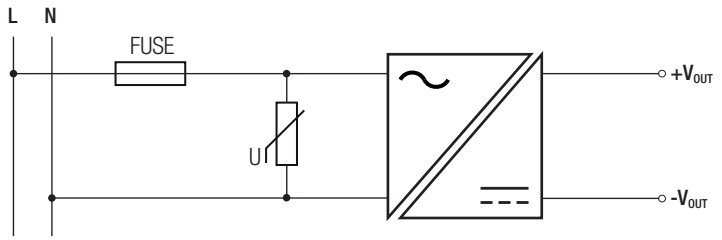
Notes:

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 derating graph	-25°C to +80°C
Maximum Case Temperature			+120°C
Temperature Coefficient			0.03%/K
Operating Altitude [8]			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 [9]	according to MIL-HDBK-217F, method 2	+25°C	1691 x 10^3 hours
		+70°C	424 x 10^3 hours

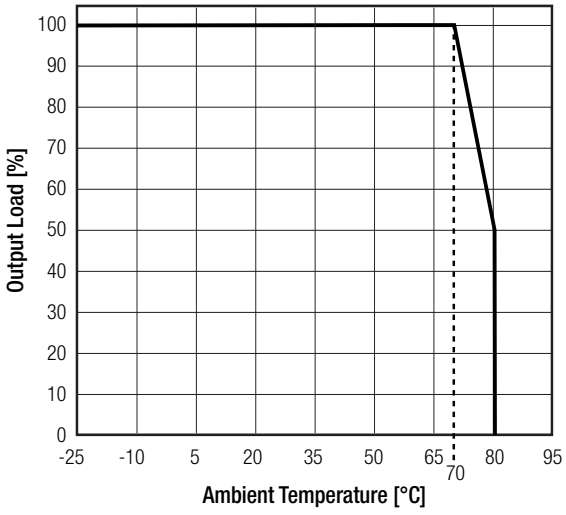
Notes:

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

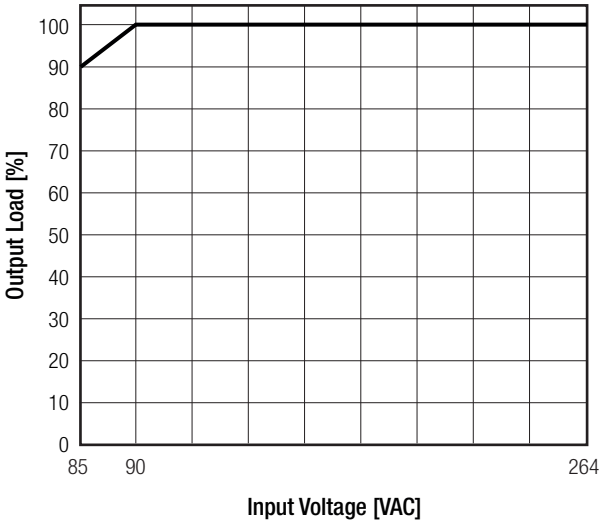
Note9: Based on calculation for 5Vout

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	E196683-A5	UL60950-1, 2nd Edition 2014 CAN/CSA-C22.2 No. 60950-1, 2nd Edition 2015
Information Technology Equipment, General Requirements for Safety	16BAS10048 11 SA1804152L01001	IEC60950-1:2005 2nd Edition + Am2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety (CB Scheme)	16BAS10048 11	IEC60950-1:2005 2nd Edition + Am2:2013

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

Certificate Type (Safety)	Report / File Number	Standard
Audio/Video, information and communication technology equipment - Part1: Safety requirements	E196683-A5 E196683-A6001	UL62368-1, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14
Audio/Video, information and communication technology equipment - Part1: Safety requirements	16BCS1004811	IEC62368-1:2014 2nd Edition EN62368-1:2014+A11:2017
Audio/Video, information and communication technology equipment - Part1: Safety requirements (CB Scheme)	SA1804152S 001	IEC62368-1:2014 2nd Edition
RoHS2		RoHS 2011/65/EU

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	EA1804152E 01001	EN55032:2015, 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: ±1kV	EN61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port: L-N ±1kV	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
Immunity to conducted disturbances, induced by radio-frequency fields	50Hz, 1A/m	IEC61000-4-8:2009; 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.

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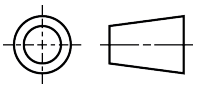
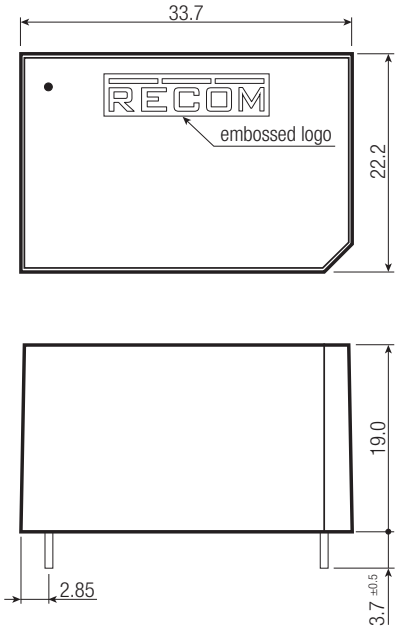
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)

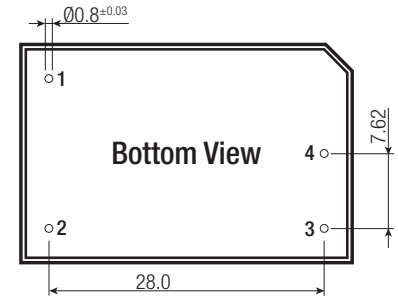




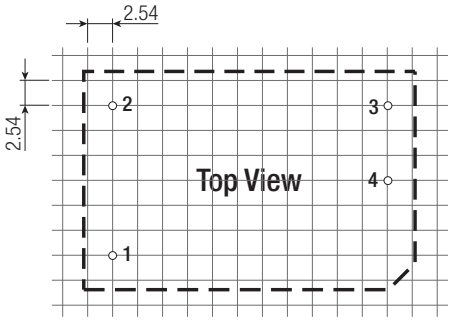
Pin Connections

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

Tolerance: xx.x= ±0.5mm
Pin width: ±0.05mm



Recommended Footprint Details



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.

The product information and specifications may be subject to changes even without prior written notice.The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.