Features

Regulated Converters

- Universal Input 85-264VAC
- 1W PCB Mount Package
- <250mW No Load Power Consumption
- -25°C to +80°C Operating Temperature
- Continuous SCP, OPP, OCP
- EN60335, UL & CE Pending, EN/IEC60950 & IEC/EN62368 Certified

RECOM

AC/DC Converter

RAC02-GA

2 Watt

Single Output EMC Class A

3 YEAR warranty

Description

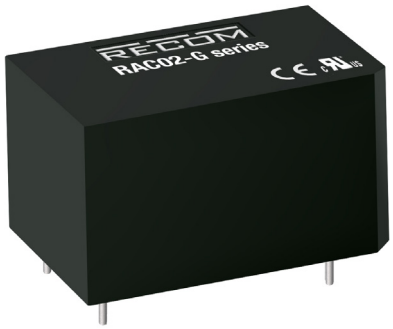
The RAC02-GA series are low cost AC/DC power supplies, ideal for PCB mounted, compact, board level industrial power supplies. They feature universal AC input voltage range, regulated and short-circuit-proof isolated DC outputs, low standby power consumption and -25°C to +80°C operating temperature range. The RAC02-GA have a built-in Class A / FCC Part 15 EMC filter, are pending to EN60335, 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 (1) [µF]
RAC02-05SGA	100-240	5	400	69	500
RAC02-12SGA	100-240	12	167	72	200

Notes:

Note1: measured with all input voltages at 25°C with constant resitant 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(2)			85VAC	230VAC	264VAC
Input Current	115VAC 230VAC				50mA 30mA
Inrush Current	cold start at 25°C	115VAC 230VAC			30A 40A
No load Power Consumption				180mW	250mW
Input Frequency Range	AC Input		47Hz	50Hz	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			0.55 0.42	

Notes:

Note2: no proper operation with DC Input Voltage.

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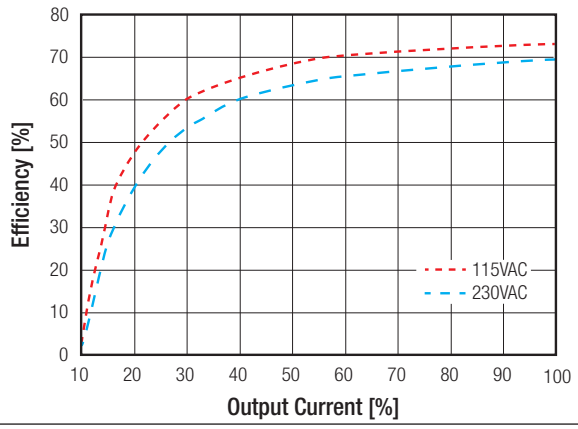
UL60950-1 Pending
IEC/EN60950-1 Certified
UL62368-1 Pending
IEC/EN62368-1 Certified
IEC60335 Pending

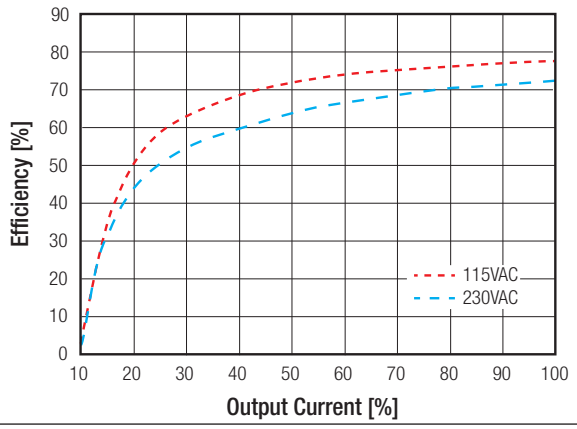
Specifications (measured @ ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

Efficiency vs. Load

RAC02-05SGA



RAC02-12SGA

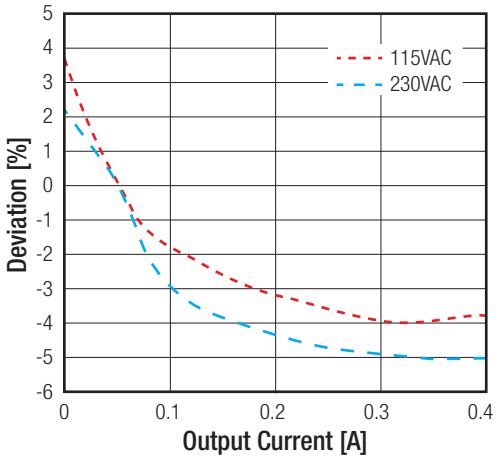


REGULATIONS

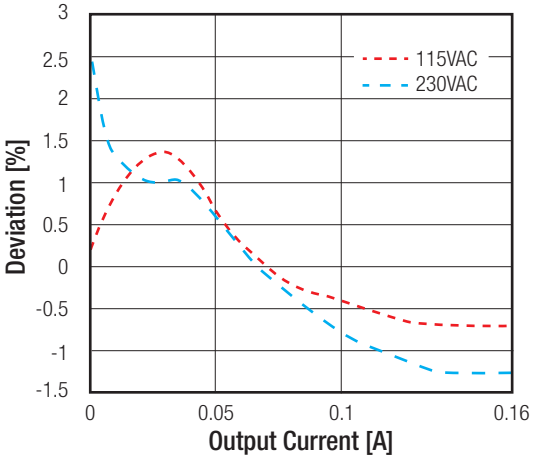
Parameter	Condition	Value
Output Accuracy	-25°C to +80°C	±6.0% max.
Line Regulation	-25°C to +80°C	±2.0% max.
Load Regulation	-25°C to +80°C	±6.0% max.

Accuracy vs. Load

RAC02-05SGA



RAC02-12SGA



PROTECTIONS

Parameter	Type		Value
Input Fuse	internal		10Ω/1W
Short Circuit Protection (SCP)	below 100mW		continuous, auto recovery
Over Power Protection (OPP)			2.2W-6W, hiccup mode, auto recovery
Over Current Protection (OCP)	5Vout 12Vout		0.44A - 1.2A, hiccup mode 0.183A - 0.5A, hiccup mode
Over Voltage Category (OVC)			OVC II
Isolation Voltage	I/P to O/P	rated for 1min	3kVAC/10mA
Isolation Resistance			100MΩ min.
Insulation Grade			Double
Leakage Current	I/P to O/P		0.25mA max.

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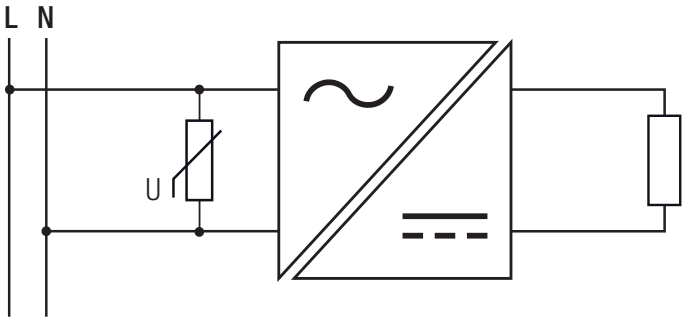
Specifications (measured @ ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

Notes:

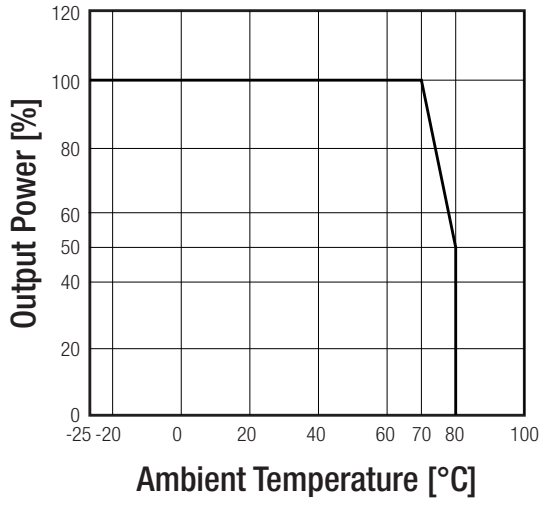
Note3: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 series



ENVIRONMENTAL		
Parameter	**Condition**	**Value**
Operating Temperature Range[4]		-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 10^3h 424 x 10^3h

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

SAFETY AND CERTIFICATIONS (pending)

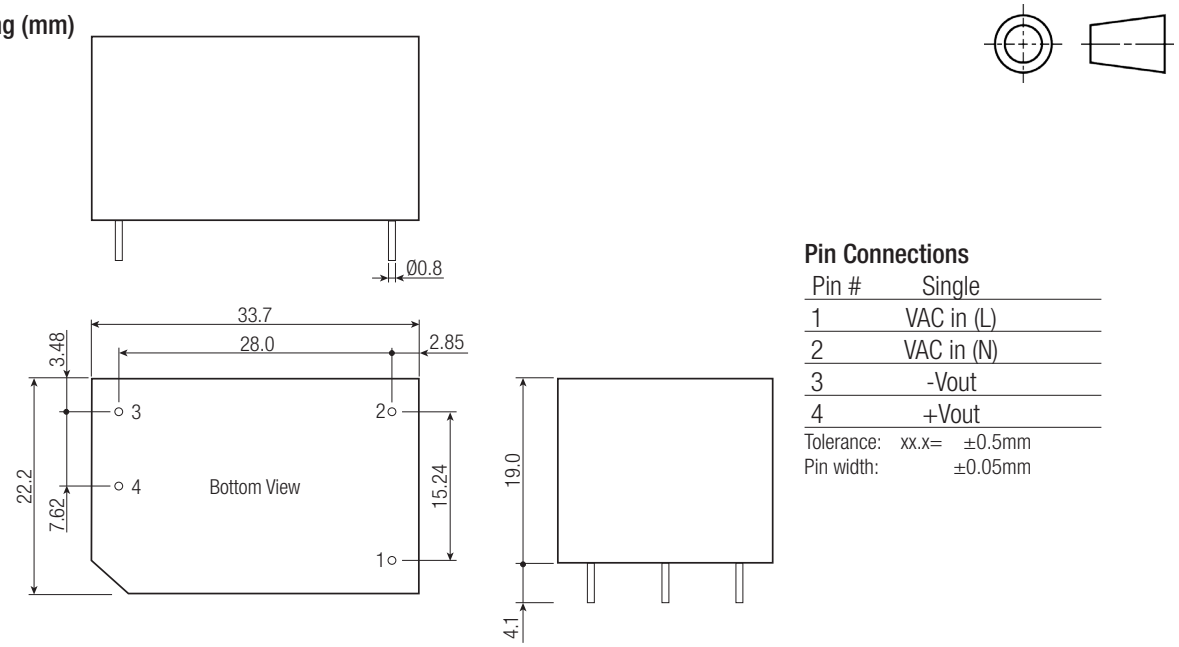
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety (CB)	16BAS1004811	IEC60950-1, 2nd Edition, 2005 + AM2, 2013 EN60950-1, 1st Edition, 2006 + AM2, 2013
Information Technology Equipment, General Requirements for Safety	pending	UL60950-1, 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
Household and similar electrical appliances - Safety. General requirements	pending	EN60335-1, 1st Edition, 2012 +AM11, 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 A
Limitations on the amount of electromagnetic intererence allowed from digital and electronic devices		47 CFR FCC Part 15, Subpart B 2016, Class A & B
ESD Electrostatic discharge immunity test	Air ±8kV, Contact ±4kV	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	±1kV	EN61000-4-4, Criteria B
Surge Immunity	±1kV	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= ±0.5mm
Pin width: ±0.05mm

Specifications (measured @ ta= 25°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 Humidtiy	non-condensing	5% - 95% RH max.