

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
- EN60335, UL & CE Pending, EN/IEC60950 & IEC/EN62368 Certified



RAC01-GA

1 Watt



Single Output
EMC Class A

Description

The RAC01-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 RAC01-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] |
|--------------|--------------------------------|----------------------|---------------------|---------------------|--|
| RAC01-05SSGA | 100-240 | 5 | 200 | 63 | 500 |
| RAC01-12SSGA | 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 ⁽²⁾ | | | 85VAC | 230VAC | 264VAC |
| Input Current | 115VAC 230VAC | | | | 0.25A 0.25A |
| Inrush Current | cold start at 25°C | 115VAC 230VAC | | | 30A 40A |
| No load Power Consumption | | | | | 0.15W |
| Input Frequency Range | AC Input | | 47Hz | | 63Hz |
| Start-up Time | 115VAC 230VAC | | | | 1s 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 | | 0.4 | | 0.6 |

Notes:

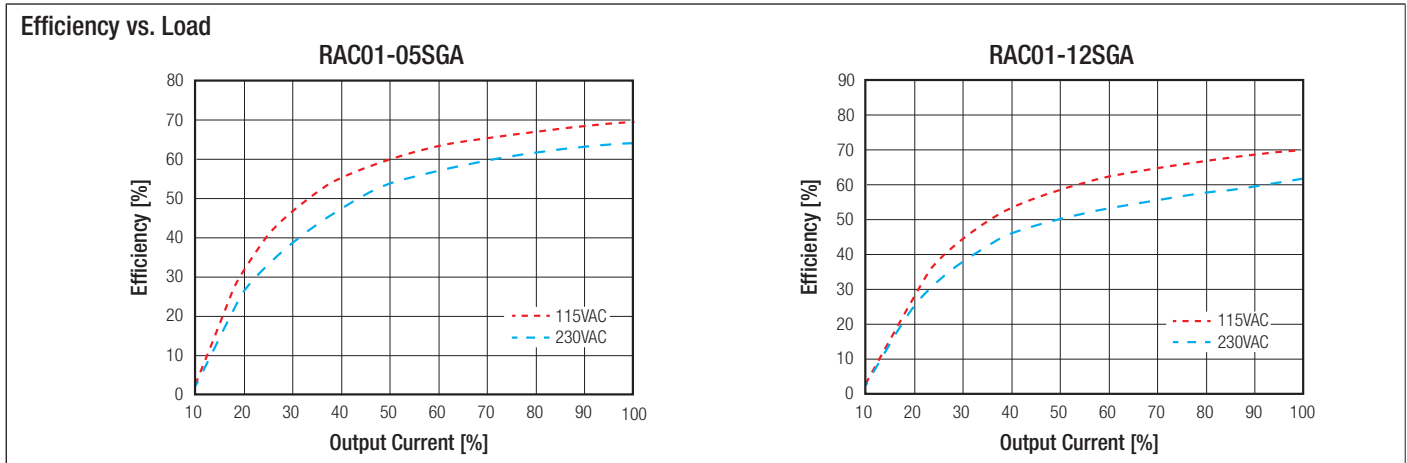
Note2: no proper operation with DC Input Voltage.

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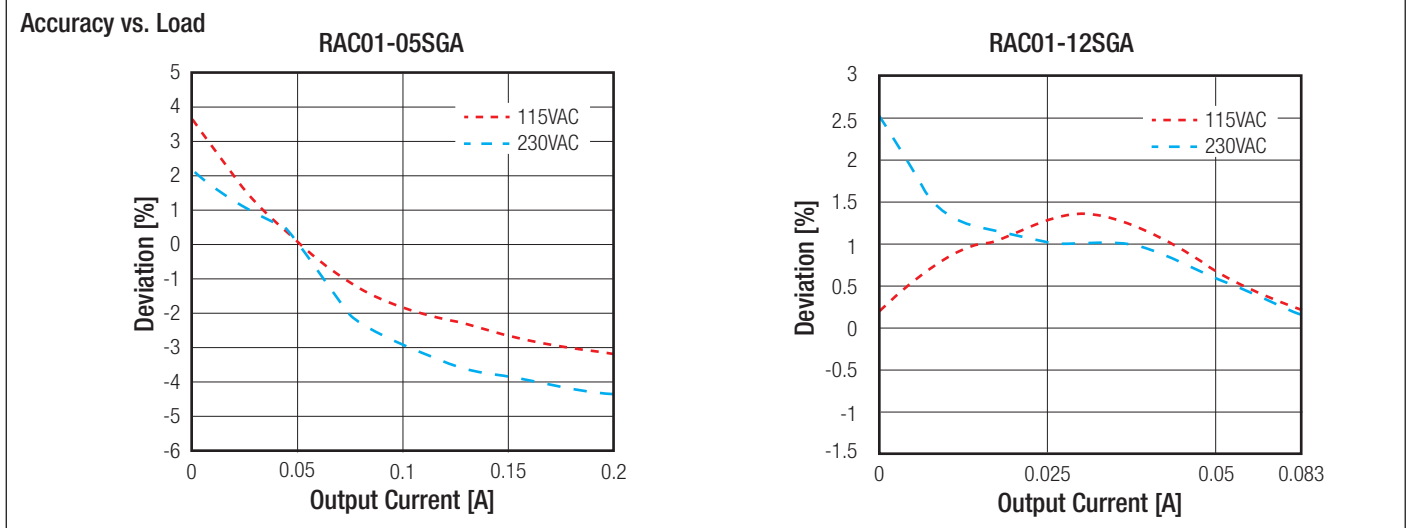
UL60950-1 Pending
IEC/EN60950-1 Certified
UL62368-1 Pending
IEC/EN62368-1 Certified
EN60335 Pending

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°C to $+80^\circ\text{C}$ | $\pm 6\%$ max. |
| Line Regulation | -25°C to $+80^\circ\text{C}$ | $\pm 2\%$ max. |
| Load Regulation | -25°C to $+80^\circ\text{C}$ | $\pm 6\%$ max. |



PROTECTIONS

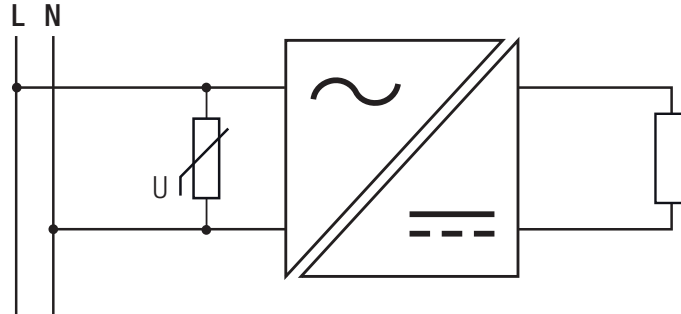
| Parameter | Type | Value |
|--------------------------------|-------------|---|
| Input Fuse | internal | $10\Omega/1\text{W}$ |
| Short Circuit Protection (SCP) | below 100mW | continuous, auto recovery |
| Over Power Protection (OPP) | 5Vout | 1.1W - 2.5W, hiccup mode, auto recovery |
| | 12Vout | 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 | | $100\text{M}\Omega$ min. |
| 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:

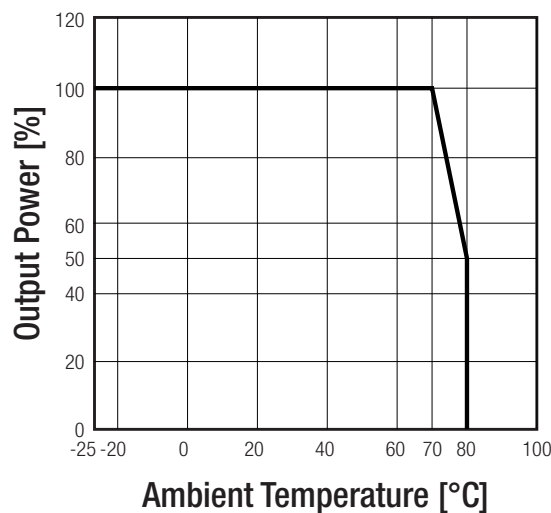
Note3: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 series



| ENVIRONMENTAL | | |
|--|--|---|
| Parameter | Condition | Value |
| Operating Temperature Range ⁽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 ³ h 424 x 10 ³ 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.

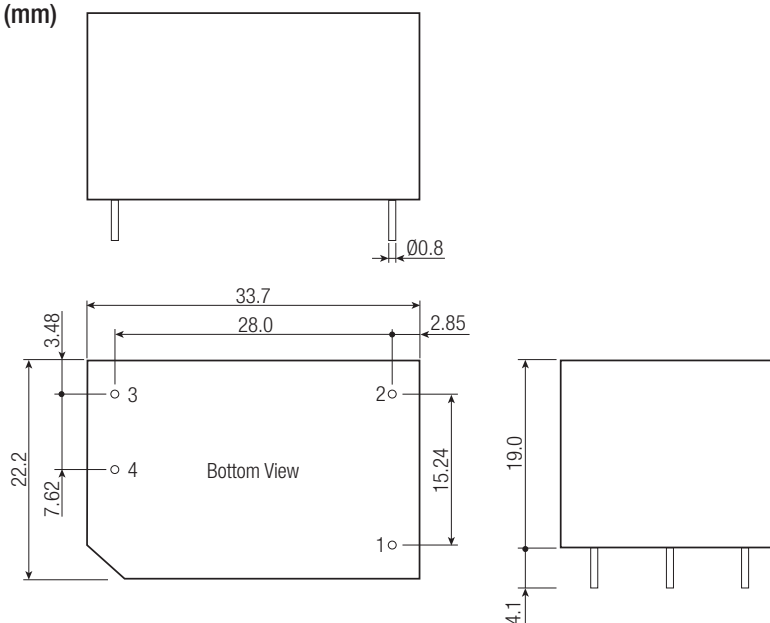
Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage (115/230VAC), full load and after warm-up)

| 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 |
| 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 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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