NOT RECOMMENDED FOR NEW DESIGNS

Features

Regulated

Converter

- 35mW max. no load power consumption
- Efficiency up to 76%
- Isolated output 3kVAC / 1 minute
- SCP, OVP protection
- Wide operating temperature range: -40°C to +85°C
- Universal input 85-305VAC



RAC02-SE/277/W

2 Watt Single Output





Description

The ultra-compact wired RAC02-SE/277/W modules are available with output voltages of 3.3, 5, 12 and 24V, and the input-to-output isolation is 3kVAC/1min. With a standby consumption of 35mW maximum, the mini power supplies are particularly suitable for energy-saving sleep mode and standby applications. Because of its compact design (height <18mm), it is a versatile solution for home automation and other similar applications. Complete with an integrated input filter, the series has enhanced EMI performance and complies with EN55032, class B. The mini power supplies are also protected against short circuit with fully automatic restart after the error has been solved. The converters are EN/UL60950-1 certified and come complete with a 3 year warranty.

| Selection Guide | | | | | |
|-------------------|--------------------------------------|----------------------------|---------------------------|---|--|
| Part Number | nom. Input Voltage Range [VAC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ ⁽¹⁾ [%] | Max. Capacitive Load ⁽²⁾ [μF] |
| RAC02-3.3SE/277/W | 100-277 | 3.3 | 600 | 67 | 12000 |
| RAC02-05SE/277/W | 100-277 | 5.0 | 400 | 70 | 5500 |
| RAC02-12SE/277/W | 100-277 | 12 | 167 | 73 | 500 |
| RAC02-24SE/277/W | 100-277 | 24 | 83 | 76 | 160 |

Notes:

Note1: Efficiency is tested at 230VAC and full load at +25°C ambient Note2: Max Cap Load is tested at nominal input and full resisitive load

Model Numbering



Ordering Examples:

RAC02-05SE/277/W 2 Watt 5Vout Single Output Wired Version RAC02-12SE/277/W 2 Watt 12Vout Single Output Wired Version

















PREFERRED ALTERNATIVESPlease consider these alternatives:

RAC05-K/277/W Series

IEC/EN60950-1 certified CAN/CSA-22.2 No. 60950 certified UL60950-1 certified EN60335-1 certified EN55032 certified EN55024 certified EN55014 certified CB Report

! NOT RECOMMENDED FOR NEW DESIGNS!



RAC02-SE/277/W

Series

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

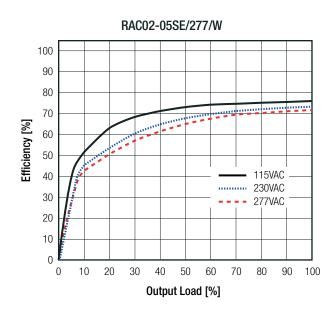
| BASIC CHARACTERISTICS | | | | | |
|------------------------------|--------------------------|------------------|-----------------|--------------|----------------------|
| Parameter | Condition | | Min. | Тур. | Max. |
| Input Voltage Range (3) | nom. Vin= 230VAC | | 85VAC 120VDC | 277VAC | 305VAC 430VDC |
| Input Current | 115VAC 230VAC | | | 47mA 30mA | |
| Inrush Current | cold start at +25°C | 115VAC 230VAC | | | 15A 30A |
| No load Power Consumption | 85-305VAC, 47-63Hz | | | | 35mW |
| Input Frequency Range | AC Input | | 47Hz | | 440Hz |
| Minimum Load | | | | 2% | |
| Hold-up Time | 115VAC | | 18ms | | |
| Internal Operating Frequency | 100% load at nominal Vin | | | 55kHz | |
| Output Ripple and Noise (4) | 3.3Vout 5, 12, 24Vout | | | | 300mVp-p 250mVp-p |

Notes:

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

Note4: Ripple and Noise is the maximum peak-to-peak voltage value measured at the output with a 20MHz bandwidth, at rated line voltage at full load. And with a 47µF low-ESR electrolytic capacitor in parallel with a 0.1µF ceramic capacitor across output

Efficiency vs. Load



| REGULATIONS | | | |
|------------------------------|----------------------------------|------------|--|
| Parameter | Condition | Value | |
| Output Voltage Tolerance (5) | | ±6.0% max. | |
| Line Regulation | low line to high line, full load | ±1.5% max. | |
| Load Regulation | 2% to 100% load | 6.0% typ. | |

Notes:

Note5: Includes initial voltage accuracy, thermal drift, line regulation and load regulation at rated input voltage and load conditions

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RAC02-SE/277/W

Series

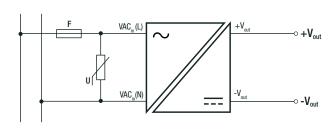
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

| PROTECTIONS | | | | |
|--------------------------------|--------------------|---------------------|--------------------------------|--|
| Parameter | Туре | | Value | |
| Short Circuit Protection (SCP) | below | 100mΩ | continuous, automatic recovery | |
| Over Voltage Protection (OVP) | zener diode clamp | | 110% - 140% | |
| Over Current Limit | | | 110% - 190% | |
| Over Voltage Category | | | OVCII | |
| Isolation Voltage | I/P to O/P | tested for 1 minute | 3kVAC | |
| Isolation Resistance | | | 1G Ω min. | |
| Leakage Current | 85-305VAC, 47-63Hz | | 10µA max. | |

Notes:

Note6: Refer to local wiring regulations if input over-current protection is also required. Recommended fuse: slow blow type

Protection Circuit

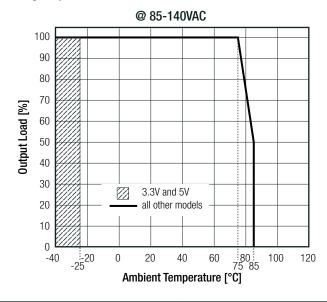


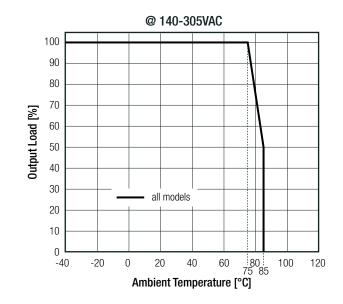
| ENVIRONMENTAL | | | | | |
|---------------------------------|-----------------------------------|-------------------------|-------------|------------------------------|--|
| Parameter | Condition | | | Value | |
| Operating Temperature Range (7) | full load, 230V | full load, 230VAC | | | |
| Operating remperature hange ** | refer to derating | refer to derating graph | | | |
| Maximum Case Temperature | | | | +105°C | |
| Thermal Impedance | | | 8.5K/W typ. | | |
| Operating Humidity | non-condensing | | | 5% - 95% RH max. | |
| MTBF | according to MIL-HDBK-217F, G.B. | +25°C | 115VAC | 2238 x 10 ³ hours | |
| INTE | according to will-HDBK-217F, G.B. | T23 0 | 230VAC | 1670 x 10 ³ hours | |

Notes:

Note7: At low input voltage (85-140VAC) and temperature below -25°C the RAC02-3.3SE/277/W and RAC02-05SE/277/W, will not start

Derating Graph





! NOT RECOMMENDED FOR NEW DESIGNS!



RAC02-SE/277/W

Series

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

| SAFETY AND CERTIFICATIONS | | |
|--|--|--|
| Certificate Type (Safety) | Report / File Number | Standard |
| Information Technology Equipment, General Requirements for Safety | L0339L26-CB-1-B4 | IEC60950-1:2005 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013 |
| Information Technology Equipment, General Requirements for Safety | E224736-X1-A24-UL | UL No. 60950-1, 2nd Edition, 2014 CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2014 |
| Household and similar electrical appliances, General requirements | L0339L26-B2-L | EN60335-1:2012+A11:2014 |
| EAC Safety of Low Voltage Equipment | RU-AT.37.02367 | TP TC 004/2011 |
| RoHS2 | | RoHS-2011/65/EU + AM-2015/863 |
| EMC Compliance (Industrial) | Condition | Standard / Criterion |
| Electromagnetic compatibility of multimedia equipment - Emission requirements | 1502CE17 | EN55032:2015, Class B |
| Information technology equipment - Immunity characteristics - Limits and methods of measurement | 10020217 | EN55024:2010 |
| ESD Electrostatic discharge immunity test | ±8.0kV air, ±4.0kV contact | EN61000-4-2:2009, Criteria B |
| 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 |
| Power Magnetic Field Immunity | 50Hz, 1 A/m | EN61000-4-8:2010, Criteria A |
| Voltage Dips and Interruption | Voltage Dips: >95% reduction >30% reduction Interruption: >95% | EN61000-4-11:2004, Criteria A EN61000-4-11:2004, Criteria A EN61000-4-11:2004, Criteria B |
| Limits of Voltage Fluctuations & Flicker | | EN61000-3-3:2013 |
| EMC Compliance (Household) | Condition | Standard / Criterion |
| Electromagnetic compatibility of multimedia equipment – Emission Requirements | | EN55014-1:2006+A2:2011 |
| Information technology equipment - Immunity characteristics - Limits and methods of measurement | E16113001 | EN55014-2:2015 |
| ESD Electrostatic discharge immunity test | ±8.0kV air, ±4.0kV contact | IEC61000-4-2:2008, Criteria A |
| Radiated, radio-frequency, electromagnetic field immunity test | 3V/m | IEC61000-4-3:2006 + A2:2010, Criteria A |
| Fast Transient and Burst Immunity | AC Power Port ±1.0kV DC Output ±0.5kV | IEC61000-4-4:2012, Criteria A |
| Surge Immunity | AC Power Port L-N ±2.0kV DC Output L-N ±1.0kV | IEC61000-4-5:2014, Criteria B |
| Immunity to conducted disturbances, induced by radio-frequency fields | AC Power Port 3V, DC Output 3V | IEC61000-4-6:2013, Criteria A |
| Voltage Dips and Interruption | Voltage Dips: >95% reduction >30% reduction Interruption: >95% | IEC61000-4-11:2004, Criteria B IEC61000-4-11:2004, Criteria C IEC61000-4-11:2004, Criteria C |
| Limits of Harmonic Current Emissions | | EN61000-3-2:2014 |
| Limits of Voltage Fluctuations & Flicker | | EN61000-3-3:2013 |

| DIMENSION AND PHYSICAL CHARACTERISTICS | | | |
|--|---------|--------------------------|--|
| Parameter | Туре | Value | |
| Material | case | black plastic, (UL94V-0) | |
| Material | potting | epoxy, (UL94V-0) | |
| Dimension (LxWxH) | | 33.7 x 22.2 x 17.75mm | |
| Weight | | 25g typ. | |
| | | | |
| continued on next page | | | |

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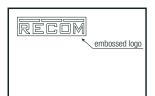


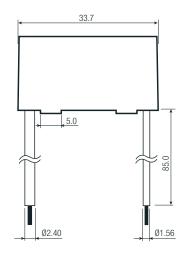
RAC02-SE/277/W

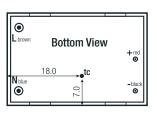
Series

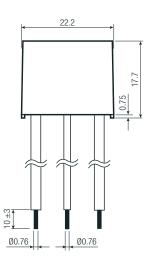
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)









Wired Connections

| Wired Color | Type | Function |
|-------------|----------------|------------|
| _1, blue | UL-1015, AWG22 | VAC in (N) |
| 2, brown | UL-1015, AWG22 | VAC in (L) |
| 3, black | UL-1430, AWG22 | -Vout |
| 4, red | UL-1430, AWG22 | +Vout |

Tolerance: $xx.x = \pm 0.5$ mm $xx.xx = \pm 0.35$ mm

| PACKAGING INFORMATION | | | |
|-----------------------------|---------------|------------------------|--|
| Parameter | Туре | Value | |
| Packaging Dimension (LxWxH) | cardboard box | 520.0 x 195.0 x 68.0mm | |
| Packaging Quantity | | 30pcs | |
| Storage Temperature Range | | -40°C to +85°C | |

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.