

Features

Regulated Converters

- 35mW max. No Load Power Consumption
- Efficiency up to 76%
- Isolated Output 3kVAC / 1 min
- SCP, OVP Protection
- Wide Operating Temperature Range:
-40°C to +85°C
- Universal Input 85-305VAC

RECOM
AC/DC Converter

RAC02-SE/277

2 Watt
Single
Output



Description

The ultra-compact RAC02-SE/277 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 EN55022, 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	Input Voltage Range (VAC)	Output Voltage (VDC)	Output Current (mA)	Efficiency typ. (%)	Max. Capacitive Load (µF)
RAC02-3.3SE/277	85-305	3.3	600	67	12000
RAC02-05SE/277	85-305	5.0	400	70	5500
RAC02-12SE/277	85-305	12	167	73	500
RAC02-24SE/277	85-305	24	83	76	160



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

BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range		85VAC 120VDC		305VAC 430VDC
Input Current	full load, 115VAC full load, 230VAC		47mA 30mA	
Inrush Current	cold start at 25°C, 115VAC cold start at 25°C, 230VAC			15A 30A
No load Power Consumption	85-305VAC, 47-440Hz			35mW
Input Frequency	AC Input	47Hz		440Hz
Hold-up time	115VAC	18ms		
Switching Frequency	100% load at nominal Vin		55kHz	
Efficiency	see Selection Guide			
Minimum Load			2%	
Output Ripple and Noise ⁽¹⁾	3.3V 5V, 12V, 24V			300mVp-p 250mVp-p

Notes:

Note1: 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.

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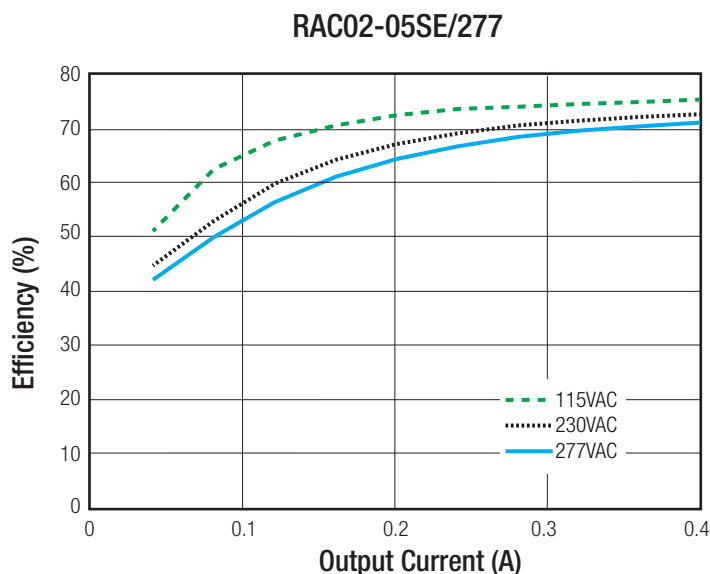


EN-50155 Certified
EN-55024 Certified
EN-60950-1 Certified
UL-60950-1 Certified

Refer to Applications Notes

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

Efficiency vs. Load



REGULATIONS

Parameter	Condition	Value
Output Voltage Tolerance ⁽²⁾		±6% max.
Line Voltage Regulation	low line to high line, full load	±1.5% max.
Load Voltage Regulation	2% to 100% load	±6% typ.

Notes:

Note2: Includes initial voltage accuracy, thermal drift, line regulation and load regulation at rated input voltage and load conditions.

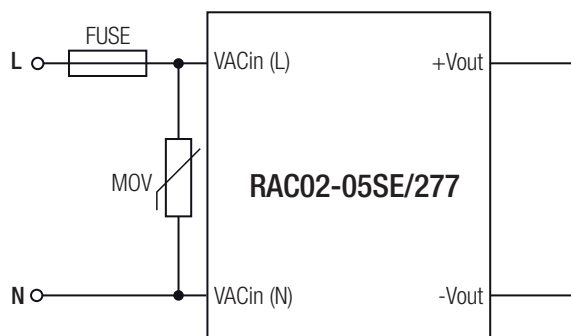
PROTECTIONS

Parameter	Type	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Over Voltage Protection (OVP)	Zener Diode clamp	110% - 140%
Over Current Limit		110% - 190%
Isolation Voltage		3kVAC / 1 Minute
Isolation Resistance		1GΩ min.
Leakage Current	85-305VAC, 47-440Hz	10μA max.

Notes:

Note3: An input fuse must be always used. Recommended fuse: T1A slow blow type

Note4: An external MOV is required. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 Series



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

ENVIRONMENTAL

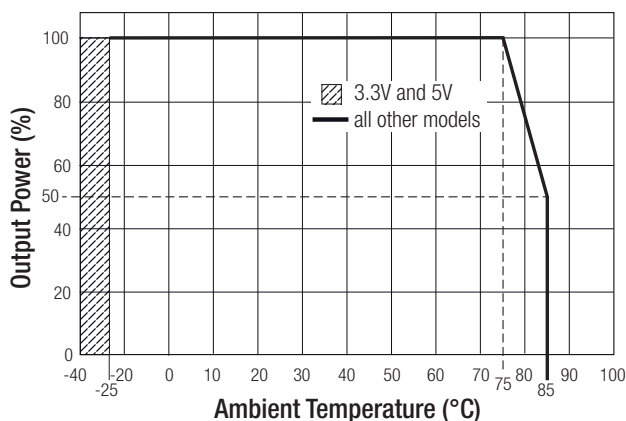
Parameter	Condition	Value
Operating Temperature Range	230VAC, with derating (see graph)	-40°C to $+85^\circ\text{C}$
Maximum Case Temperature		$+105^\circ\text{C}$
Storage Temperature Range		-40°C to $+85^\circ\text{C}$
Thermal Impedance		8.5°C/W typ.
Humidity	non-condensing	5% - 95%, RH max.
MTBF ⁽⁵⁾	MIL-HDBK-217F, 115VAC, $+25^\circ\text{C}$ MIL-HDBK-217F, 230VAC, $+25^\circ\text{C}$	2238×10^3 hours 1670×10^3 hours

Notes:

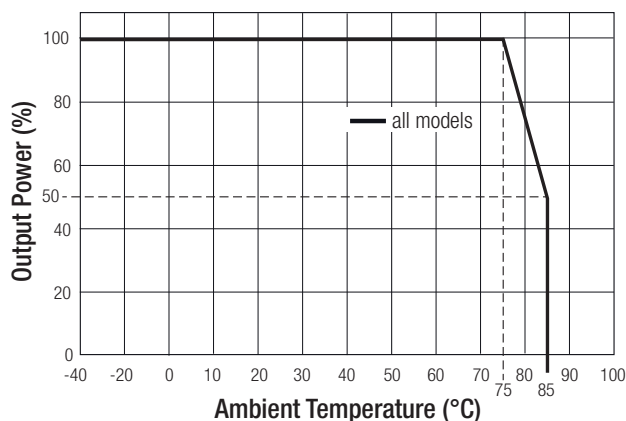
Note5: MTBF is referring RAC02-05SE/277

Derating Graph

@ 85-140VAC



@ 140-305VAC



SAFETY AND CERTIFICATIONS

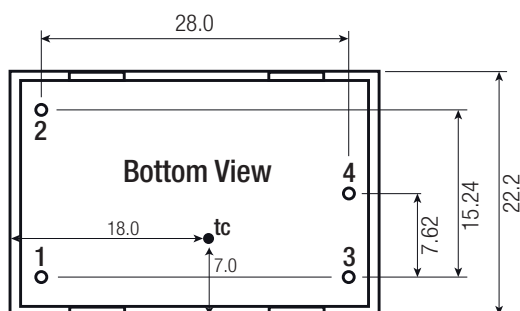
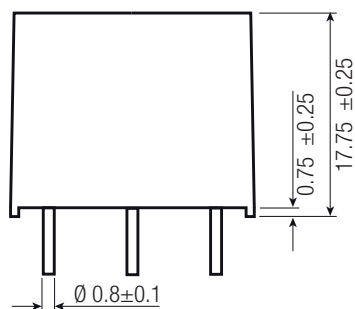
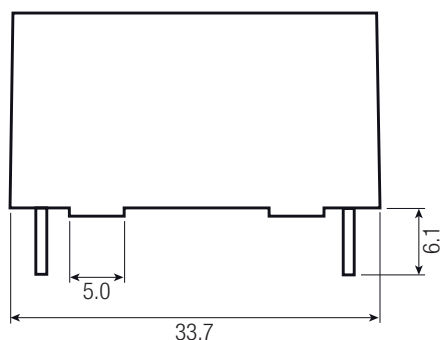
Certificate Type	Report / File Number	Standard
EN General Safety	SPCLVD1208051	EN-60950-1, 2nd Edition
UL General Safety	E224736	UL-60950-1, 2nd Edition
Certificate Type (Environmental)	Report / File Number	Standard / Criterion
ESD	Report: 1502CE17	EN61000-4-2, Criteria B
Radiated Immunity		EN61000-4-3, Criteria A
Fast Transient		EN61000-4-4, Criteria B
Surge		EN61000-4-5, Criteria B
Conducted Immunity		EN61000-4-6, Criteria A
Voltage dips and variations		EN61000-4-8, Criteria A
Voltage flicker		EN-61000-3-3
EMI Standard	Report: 1502CE17	EN55022, Class B EN55024
Vibration		MIL-STD-202G
Over Voltage Category		OVC II

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

DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case Potting	UL94V-0, black plastic UL94V-0, Silicone
Dimensions (LxWxH)		33.7 x 22.2 x 17.75mm
Weight		24.5g typ.
Packaging Dimensions (LxWxH)	Tube	520 x 37 x 28mm
Packaging Quantity		22 pcs.

Mechanical Dimensions (mm)



Pin Connections

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

Tolerance: xx.x= ±0.5mm

xx.xx= ±0.35mm

Pin width: ±0.05mm