

# 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



## 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 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/W	85-305	3.3	600	67	12000
RAC02-05SE/277/W	85-305	5.0	400	70	5500
RAC02-12SE/277/W	85-305	12	167	73	500
RAC02-24SE/277/W	85-305	24	83	76	160



### Specifications (measured at TA= 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		
Operating Frequency	100% load at nominal Vin		55kHz	
Efficiency			see Selection Guide	
Minimum Load			2%	
Output Ripple and Noise <sup>(1)</sup>	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.

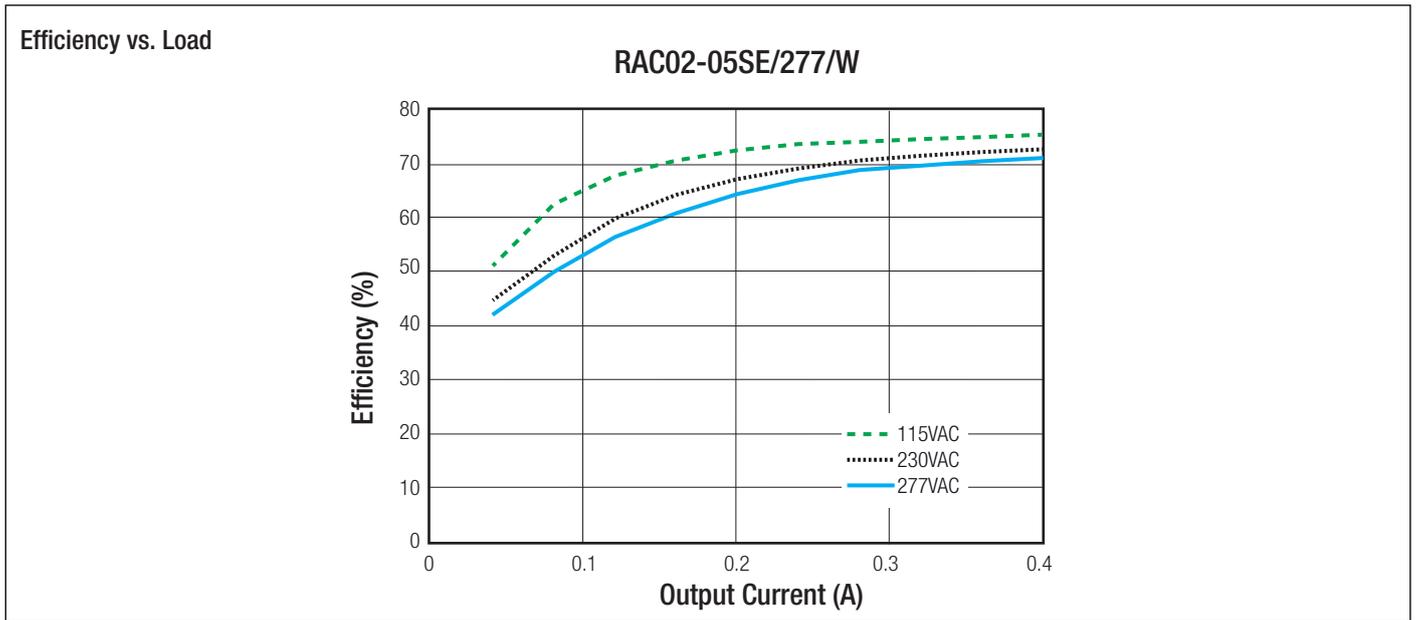
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EN-50155 Certified  
EN-55024 Certified  
EN-60950-1 Certified  
UL-60950-1 Certified

Refer to Applications Notes

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



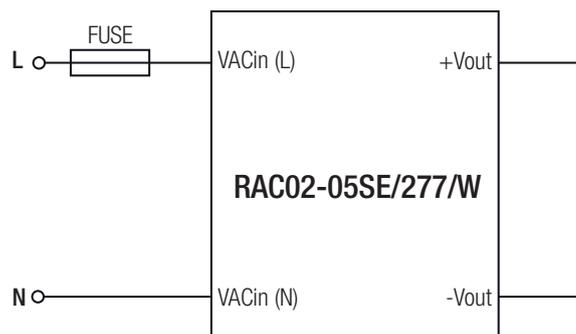
REGULATIONS		
Parameter	Condition	Value
Output Voltage Tolerance <sup>(2)</sup>		±6% max.
Line Voltage Regulation	low line to high line, full load	±1.5% max.
Load Voltage Regulation	2% to 100% load	±6% typ.

**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.



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

### ENVIRONMENTAL

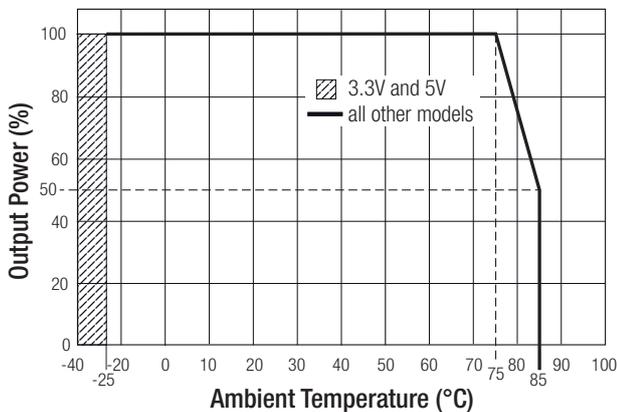
Parameter	Condition	Value
Operating Temperature Range	230VAC, with derating (see graph)	-40°C to +85°C
Maximal Case Temperature		+105°C
Storage Temperature Range		-40°C to +85°C
Thermal Impedance		8.5°C/W typ.
Humidity	non-condensing	5% - 95%, RH max.
MTBF <sup>(3)</sup>	MIL-HDBK-217F, 115VAC, +25°C MIL-HDBK-217F, 230VAC, +25°C	2238 x 10 <sup>3</sup> hours 1670 x 10 <sup>3</sup> hours

**Notes:**

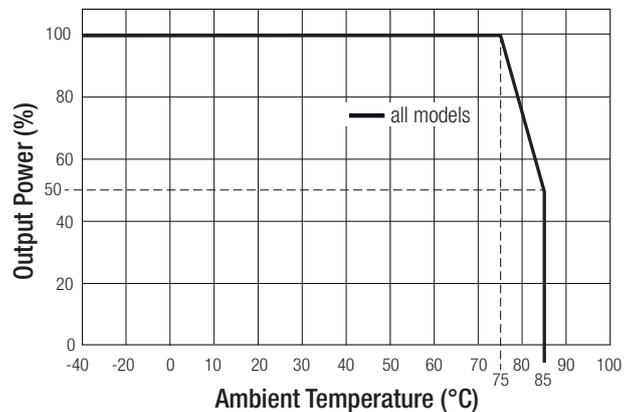
Note3: MTBF is referring RAC02-05SE/277/W

### Derating Graph

@ 85-140VAC



@ 140-305VAC



### SAFETY AND CERTIFICATIONS

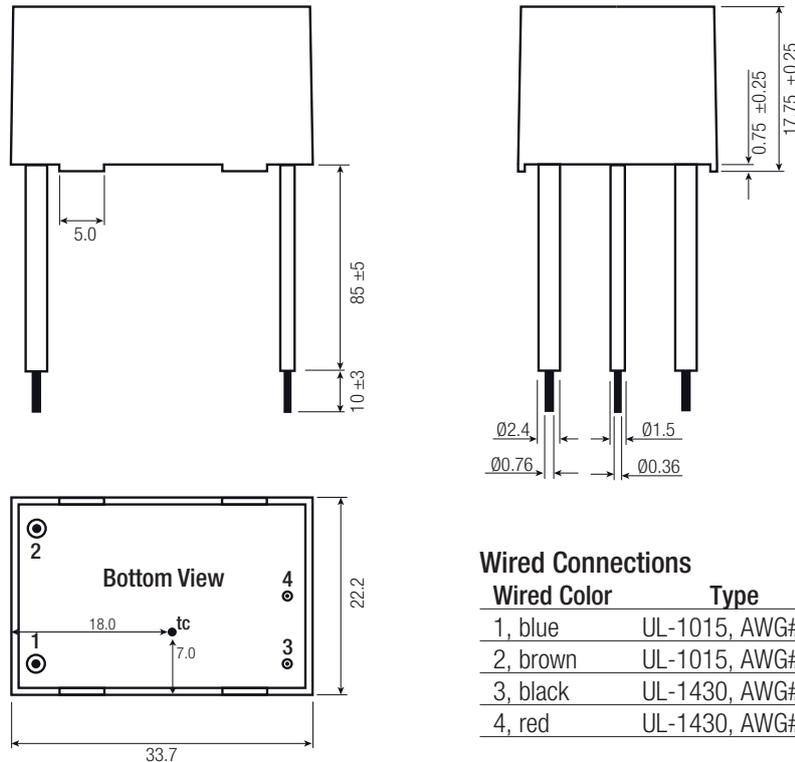
Certificate Type	Report / File Number	Standard
EN General Safety	SPCLVD1208051	EN-60950-1, 2nd Edition
UL General Safety	E224736	UL-60950-1, 2nd Edition

Certificate Type (Environmental)	Report / File Number	Standard / Criterion
ESD		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
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, Epoxy
Dimensions (LxWxH)		33.7 x 22.2 x 17.75mm
Weight		25g typ.
Packaging Dimensions (LxWxH)	Cardboard Box	520 x 195 x 67mm
Packaging Quantity		30 pcs.

### Mechanical Dimensions (mm)



### Wired Connections

Wired Color	Type	Single
1, blue	UL-1015, AWG#22	VAC in (N)
2, brown	UL-1015, AWG#22	VAC in (L)
3, black	UL-1430, AWG#22	-Vout
4, red	UL-1430, AWG#22	+Vout

Tolerance: xx.x= ±0.5mm  
xx.xx= ±0.35mm