Features

Regulated Converters

- 30mW max. No Load Power Consumption
- High Efficiency up to 80%
- 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

RAC03-SE/277

3 Watt Single Output



EN55024 Certified
EN60950-1 Certified
UL60950-1 Certified
EN60335-1 Certified

Description

The ultra-compact RAC03-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 30mW 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	nom. Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. [%]	Max. Capacitive Load (1) [µF]
RAC03-3.3SE/277	100-277	3.3	900	71	22000
RAC03-05SE/277	100-277	5	600	76	7500
RAC03-12SE/277	100-277	12	250	78	1000
RAC03-24SE/277	100-277	24	125	80	200

Notes:

Note1: Test by minimum input and constant resistor load.

Specifications (measured @ 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	115VAC 230VAC			70mA 45mA	
Inrush Current	cold start at +25°C	115VAC 230VAC			15A 30A
No load Power Consumption	85-305VAC, 47-63Hz				30mW
Input Frequency Range	AC Input		47Hz		440Hz
Hold-up time	115VAC 230VAC			15ms 80ms	
Internal Operating Frequency	100% load at nominal Vin			55kHz	
Minimum Load				2%	
Output Ripple and Noise (2)				200mVp-p	

Notes:

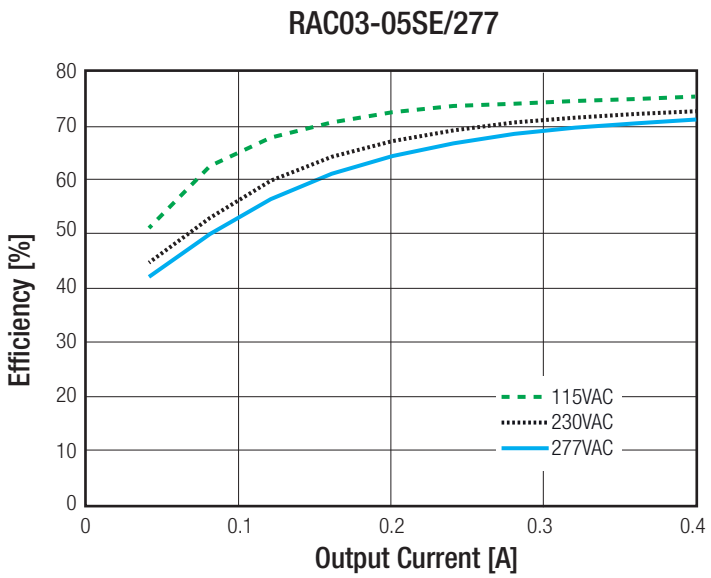
Note2: Ripple and Noise is the maximum peak-to-peak voltage value measured at the output with a 20MHz bandwidth, at rated line voltage at full load. And with a 47µF low-ESR electrolytic capacitor in parallel with a 0.1µF ceramic capacitor across output.

continued on next page

RAC03-SE/277 Series

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

Efficiency vs. Load



REGULATIONS

Parameter	Condition	Value
Output Voltage Tolerance (3)		±6.0% max.
Line Voltage Regulation	low line to high line, full load	±1.0% typ. / ±1.5% max.
Load Voltage Regulation	10% to 100% load	±6.0% typ.

Notes:

Note3: Includes initial voltage accuracy, thermal drift, line regulation and load regulation at rated input voltage and load conditions.

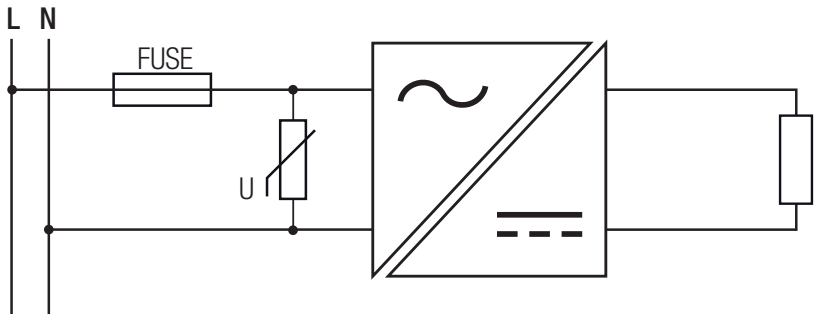
PROTECTIONS

Parameter	Type	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Over Voltage Protection (OVP)	Zener Diode clamp	112% - 140%
Over Current Limit		120% - 190%
Over Voltage Category		OVC II
Isolation Voltage	tested for 1 minute	3kVAC
Isolation Resistance		1GΩ min.
Leakage Current	85-305VAC, 47-63Hz	10µA max.

Notes:

Note4: An input fuse is required if the mains supply is not over-current protected. Recommended fuse: T1A slow blow type

Note5: An external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 Series



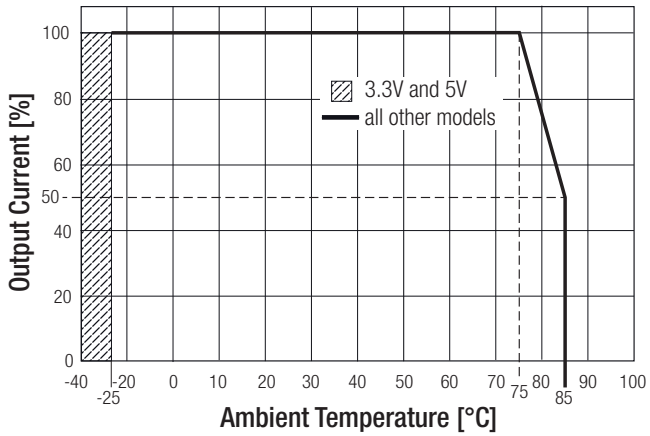
Specifications (measured @ ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

ENVIRONMENTAL

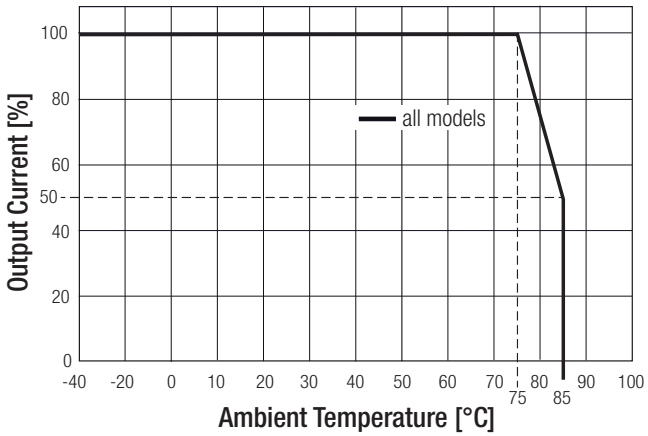
Parameter	Condition		Value
Operating Temperature Range [6]	with derating (see graph)		-40°C to +85°C
Maximum Case Temperature			105°C
Thermal Impedance			10°C / W typ.
Humidity	non-condensing		5% - 95%, RH max.
Vibration			MIL-STD-202G
MTBF	MIL-HDBK-217F G.B., +25°C	115VAC 230VAC	3503 x 10^3 hours 1816 x 10^3 hours

Derating Graph

@ 85-140VAC



@ 140-305VAC



Notes:

Note6: At low input voltage (85-140VAC) and temperature below -25°C the RAC03-3.3SE/277 and RAC03-05SE/277, will not start.

SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety (LVD)	LVD1208051	IEC60950-1, 2nd Edition, 2009 EN60950-1, 2nd Edition, 2011
Information Technology Equipment, General Requirements for Safety	E224736-X1-A24	UL60950-1, 2nd Edition, 2014 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition 2014
Household and similar electrical appliances, General requirements	L0339L26-B2	EN60335-1, 2014

EMC Compliance	Condition	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	Report: 1502CE17	EN55022, Class B EN55024
ESD Electrostatic discharge immunity test	±8kV Air Discharge; ±6kV Contact	EN61000-4-2, Criteria B
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1kV	EN61000-4-4, Criteria B
Surge Immunity	AC Power Port: line to line: ±1kV	EN61000-4-5, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V/m	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	1 A/m	EN61000-4-8, Criteria A
Voltage Dips and Interruption	Voltage Dips: >95% reduction >30% reduction Interruption: >95%	EN61000-4-11, Criteria B EN61000-4-11, Criteria C EN61000-4-11, Criteria C
Voltage Fluctuations and Flicker in Public Low-Voltage Systems		EN61000-3-3

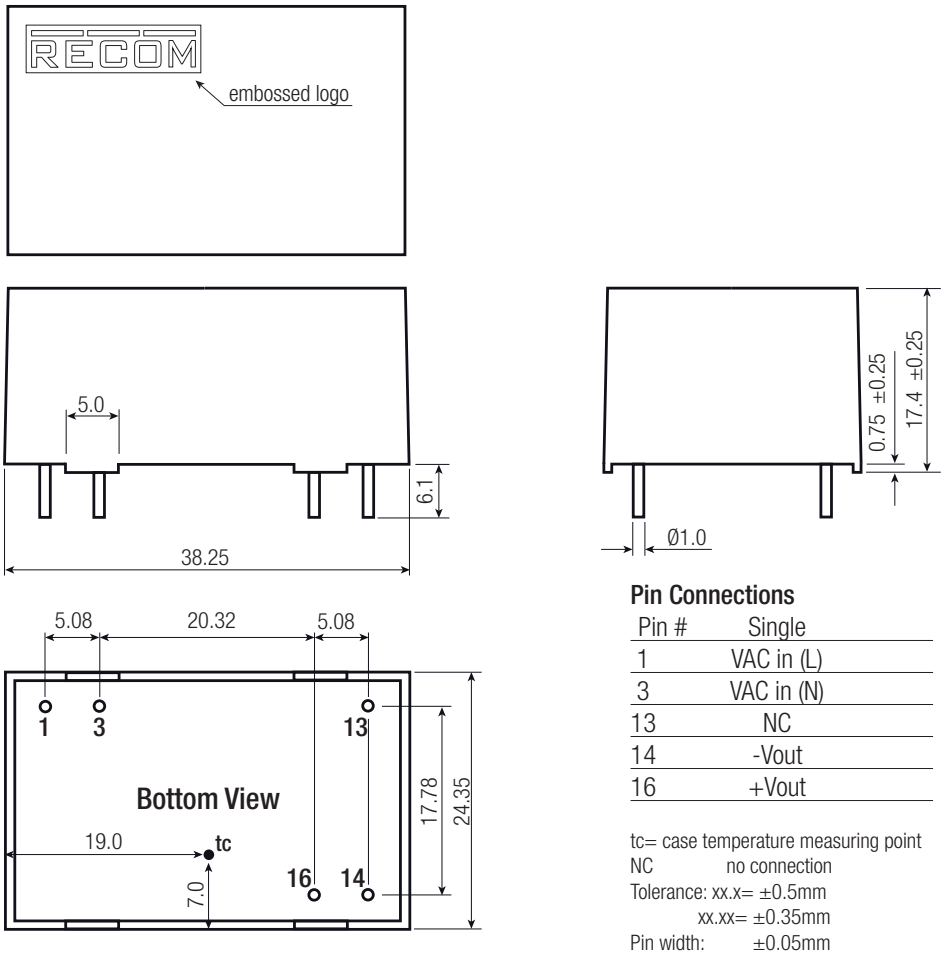
RAC03-SE/277 Series

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

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case Potting	black plastic (UL94 V-0) silicone (UL94 V-0)
Package Dimension (LxWxH)		38.25 x 24.35 x 17.4mm
Package Weight		28g typ.

Dimension Drawing (mm)



Pin Connections

Pin #	Single
1	VAC in (L)
3	VAC in (N)
13	NC
14	-Vout
16	+Vout

tc= case temperature measuring point
NC no connection
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.35mm
Pin width: ±0.05mm

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	520.0 x 32.0 x 27.0mm
Packaging Quantity		12 pcs
Storage Temperature Range		-40°C to +85°C

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