Features

Regulated Converters

- 50mW max. No Load Power Consumption
- High Efficiency up to 79%
- Isolated Output 3.75kVAC / 1 min
- SCP, OVP Protection
- Wide Operating Temperature Range:
  -40°C to +80°C (only with suffix „-E“)
- Universal Input 80-305VAC

RECOM
AC/DC Converter

RAC04-C/277

4 Watt Single and Dual Output

3 YEAR 3 warranty

Description

The RAC04-xxS_DC/277 series are fully certified single and dual regulated AC/DC converters in an encapsulated PCB-mount package style with 3.75kVAC isolation and very low stand-by power consumption. The modules are suitable for worldwide use due to their wide input voltage range from 80VAC to 305VAC. Possible uses include home automation, standby applications and industrial controls.

Selection Guide

Part Number	Input Voltage Range (VAC)	Output Voltage (VDC)	Output Current (mA)	Efficiency typ. (%)	Max. Capacitive Load (1+2) (µF)
RAC04-3.3SC/277(3)	80-305	3.3	1200	72	10000
RAC04-05SC/277 (3)	80-305	5	800	75	7200
RAC04-12SC/277 (3)	80-305	12	333	78	1000
RAC04-15SC/277 (3)	80-305	15	267	79	820
RAC04-24SC/277 (3)	80-305	24	167	79	220
RAC04-0512DC/277 (3)	80-305	5/12	720/33	75	4700/100
RAC04-05DC/277 (3)	80-305	±5	±400	76	±3300
RAC04-12DC/277 (3)	80-305	±12	±166	78	±680

Notes:

Note1: Measured @ 230VAC/50Hz/Ta 25°C with constant resistant mode at full load.

Note2: If used @115VAC/60Hz with full load, max. capacitive load is less, please contact RECOM for detailed information.



Model Numbering

RAC04-___C/277 -_

Output Voltage

Single or Dual

Temperature (3)

Ordering Examples:

e.g. RAC04-3.3SC/277-E, Single Output, with -40° to +80°C operating temperature range
e.g. RAC04-05DC/277, Dual Output with standard operating temperature range

Notes:

Note3: with suffix “-E” for -40°C to +80°C operating temperature range
without suffix standard operating temperature range (-25°C to +80°C)

E224736

IEC-60950-1 Certified
EN-55024 Certified
EN-60950-1 Certified
UL-60950-1 Certified

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

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range		80VAC 113VDC	277VAC 390VDC	305VAC 430VDC
Input Current	full load, 115VAC full load, 230VAC			98mA 64mA
Inrush Current	cold start at 25°C, 115VAC cold start at 25°C, 230VAC			15A 30A
No load Power Consumption	80-305VAC, 50/60Hz			50mW
Input Frequency Range	AC Input	47Hz		440Hz
Hold-up time	115VAC	15ms		

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RAC04-C/277 Series

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

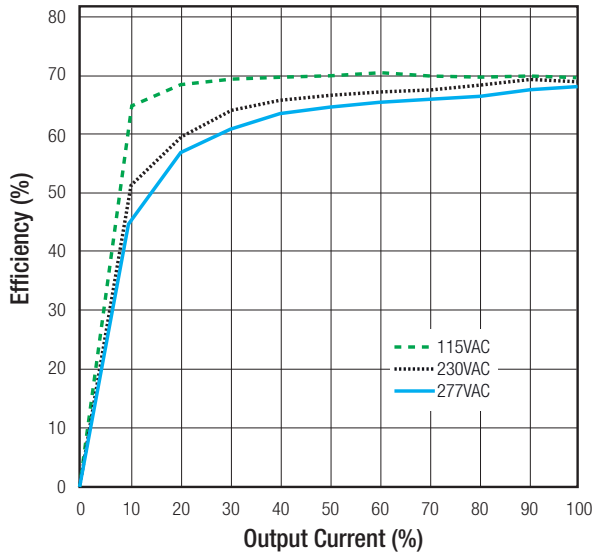
BASIC CHARACTERISTICS				
Parameter	**Condition**	**Min.**	**Typ.**	**Max.**
Operating Frequency	full load		67kHz	
Efficiency				see Selection Guide
Minimum Load	RAC04-0512DC/277(-E) All Others		±5% / ±0% 0%	
Output Ripple and Noise (4)			200mVp-p	

Notes:

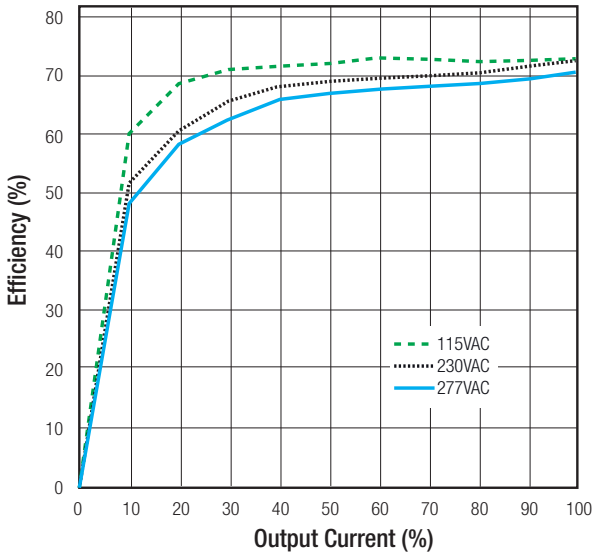
Note4: Ripple and Noise is measured at 20MHz bandwidth and with a 47µF low-ESR electrolytic capacitor in parallel with a 0.1µF ceramic capacitor across output.

Efficiency vs. Load

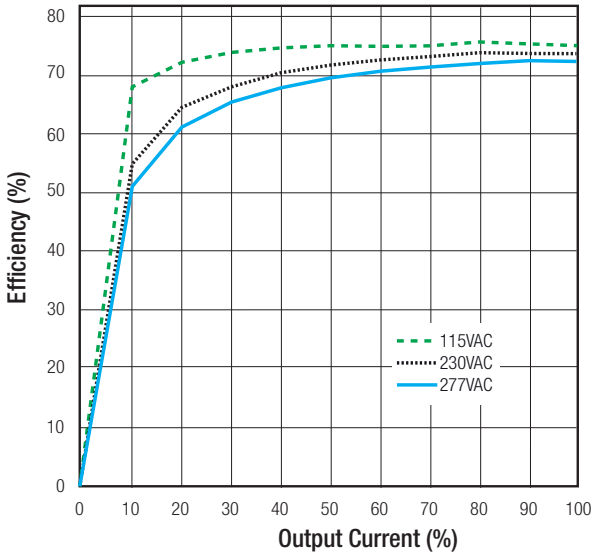
RAC04-3.3SC/277 (-E)



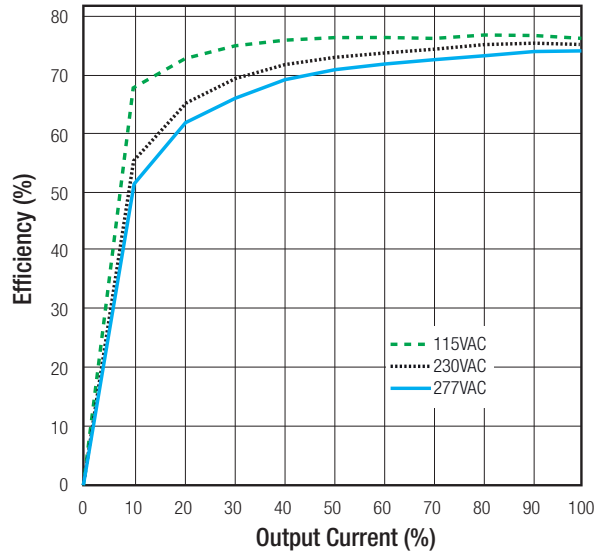
RAC04-05SC/277 (-E)



RAC04-12SC/277 (-E)



RAC04-15SC/277 (-E)



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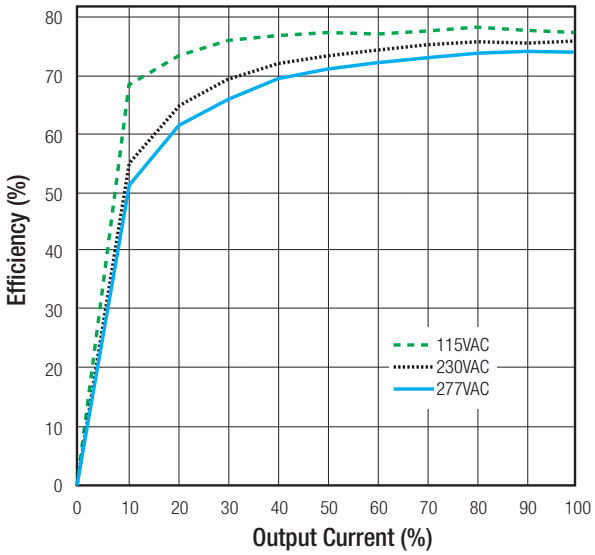
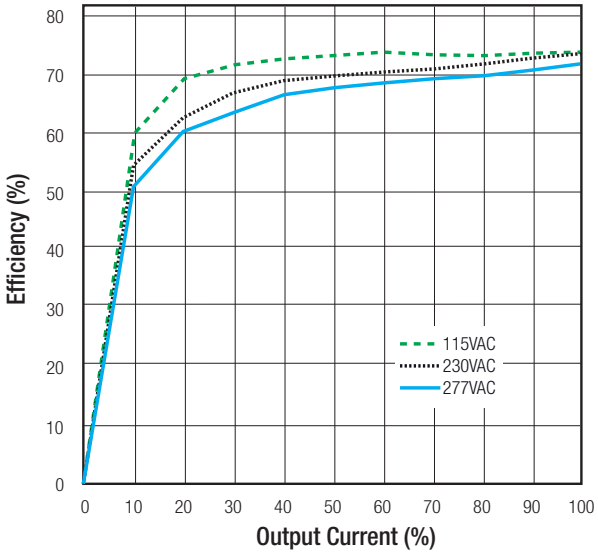
Specifications (measured at T_A= 25°C, nominal input voltage, full load and after warm-up)

Efficiency vs. Load

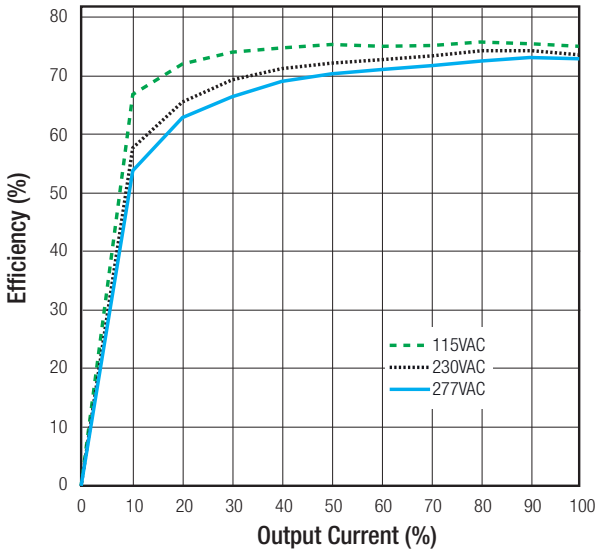
RAC04-24SC/277 (-E)



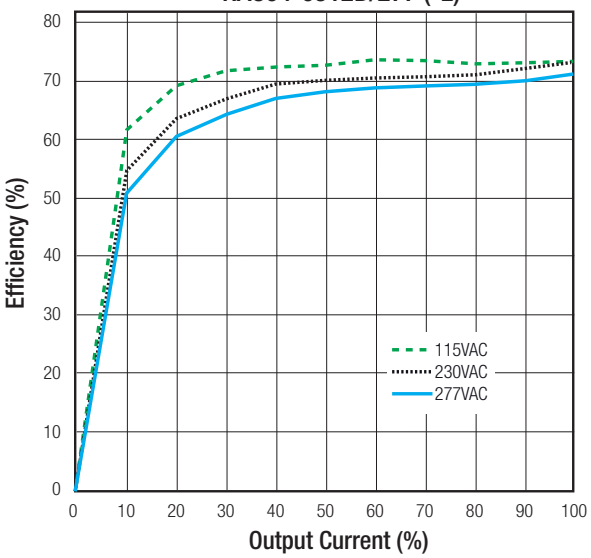
RAC04-05DC/277 (-E)



RAC04-12DC/277 (-E)



RAC04-0512D/277 (-E)



REGULATIONS		
Parameter	**Condition**	**Value**
Output Voltage Tolerance	RAC04-0512DC/277(-E) All Others	±2% / ±10% typ. ±2% typ.
Line Voltage Regulation	90-305VAC, RAC04-0512DC/277(-E) 90-305VAC, All Others	±0.2% / ±1% typ. ±0.2% typ.
Load Voltage Regulation (5V minimum load 5% @12V full load)	3.3V, 5V RAC04-0512DC/277(-E) All Others	±1% typ. ±1% / ±5% typ. ±0.5% typ.

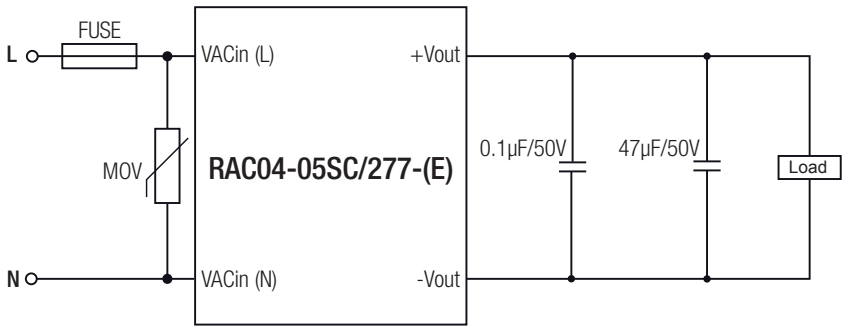
RAC04-C/277 Series

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

PROTECTIONS

Parameter	Type	Value
Short Circuit Protection (SCP)		automatic recovery
Isolation Voltage	I/P to O/P	3.75kVAC / 1 Minute
Isolation Resistance		100MΩ min.
Leakage Current	277VAC / 50Hz	0.25mA max.

Application Note



Notes:

Note5: An external input fuse is recommended: T1A slow blow type

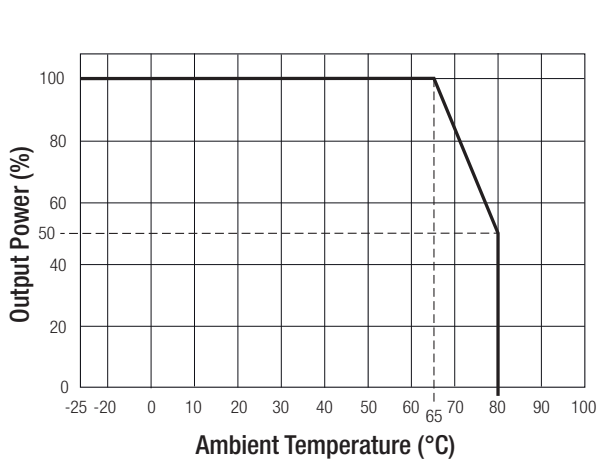
Note6: To measure the output ripple and noise short runs by 0.1µF/50V & 47µF/50V @20MHz, nominal input and full load.

Note7: An external MOV is required for 230VAC operation. (MOV model: shall comply with IEC 61051-2, e.g. Epcos S14 Series.

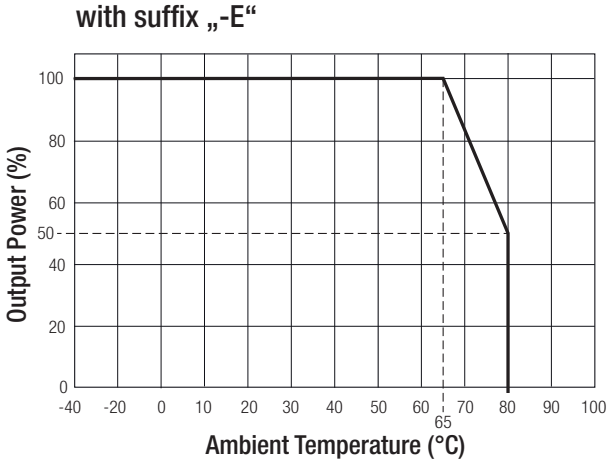
ENVIRONMENTAL

Parameter	Condition	Value
Operating Temperature Range	230VAC, with derating (see graph) with suffix "-E", with derating (see graph)	-25°C to +80°C -40°C to +80°C
Maximum Case Temperature		90°C
Thermal Impedance		10°C / W
Humidity	non-condensing	95%, RH max.
MTBF [8]	MIL-HDBK-217F, +25°C	500 x 10^3 hours

Derating Graph



with suffix „-E“



RAC04-C/277 Series

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

SAFETY AND CERTIFICATIONS

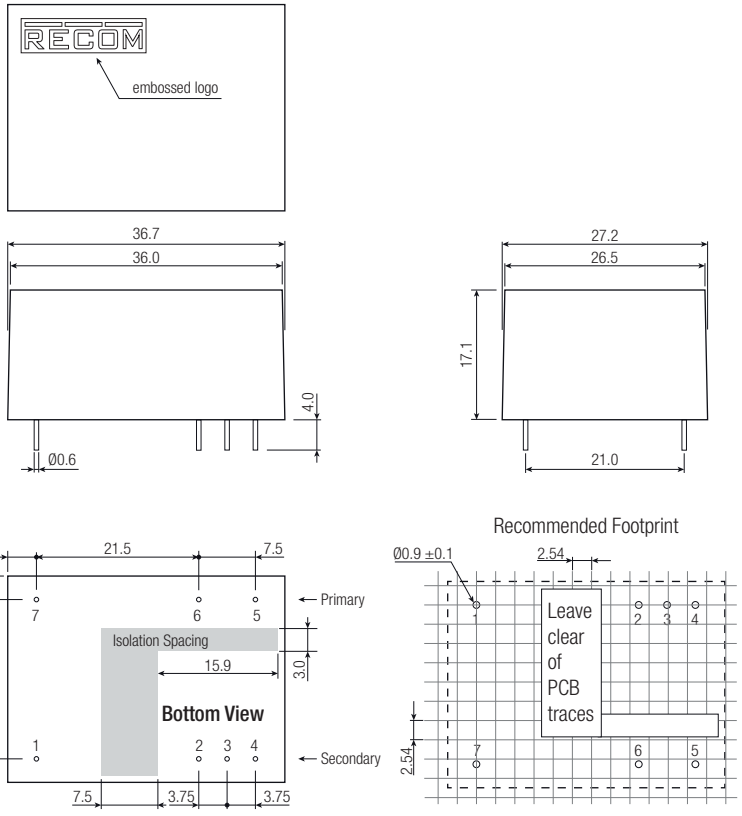
Certificate Type	Report / File Number	Standard
CB Report	1310055-1-CB-M1	IEC-60950-1, 2nd Edition
EN General Safety	SPCLVD1310055-1-M1	EN-60950-1, 2nd Edition
UL General Safety	E224736-X1-A18	UL-60950-1, 2nd Edition, 2011
Canada General Safety		CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2011

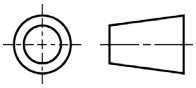
Certificate Type (Environmental)	Report / File Number	Standard / Criterion
EMI Standard	Report: T160225D10-E	EN55022, Class B EN55024
ESD	Report: T160225D10-E	EN61000-4-2, Criteria B
Radiated Immunity		EN61000-4-3, Criteria A
Fast Transient		EN61000-4-4, Criteria B
Surge		EN61000-4-5, Criteria B
Conducted Immunity		EN61000-4-6, Criteria A
Voltage dips and variations		EN61000-4-8, Criteria A
Harmonic Current Emissions		EN-61000-3-2
Voltage flicker		EN-61000-3-3
Vibration		MIL-STD-202G
Over Voltage Category		OVC II

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Case Material		UL94V-0, black plastic
Potting Material		UL94V-0, Silicone
Package Dimension (LxWxH)		36.7 x 27.2 x 17.1mm
Package Weight		41g typ.

Dimension Drawing (mm)





Pin Connections

Pin #	Single	Dual	Dual (asymmetric)
2	+VDC out	+VDC out	+5V
3	-VDC out	Com	Com
4	NC	-VDC out	+12V
5	VAC in (L)	VAC in (L)	VAC in (L)
6	VAC in (N)	VAC in (N)	VAC in (N)
7	NC	NC	NC

NC= no connection
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.35mm
Pin width: ±0.05mm

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

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	Tube	520 x 32 x 27mm
Packaging Quantity		12 pcs.
Storage Temperature Range		-40°C to +100°C

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