

!NOT RECOMMENDED FOR NEW DESIGNS!

RECOM
AC/DC Converter

Features

- Continuous short circuit protection
- Efficiency up to 79%
- Universal input 80-264VAC

Regulated Converters

- 100mW no load power consumption
- Isolated output 3.75kVAC / 1 min
- EN, UL and CE/EAC certified

RAC04-C/230

4 Watt Single & Dual Output



Description

The RAC04-C/230 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 standby power consumption. The converters have SC protected single as well as dual outputs and meet EN55032 class B without any external components. Uses include board-level power supplies, home automation, instrumentation systems and standby applications.

Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ [%]	Max. Capacitive Load ⁽¹⁾ [µF]
RAC04-3.3SC/230	80-264	3.3	1200	72	10000
RAC04-05SC/230	80-264	5	800	75	7200
RAC04-12SC/230	80-264	12	333	77	1000
RAC04-15SC/230	80-264	15	267	78	820
RAC04-24SC/230	80-264	24	167	79	220
RAC04-0512DC/230	80-264	5/12	720/33	75	4700/100
RAC04-05DC/230	80-264	±5	±400	76	±3300
RAC04-12DC/230	80-264	±12	±166	78	±680

Notes:

Note1: measured at 115VAC

Model Numbering



Ordering Examples:

- e.g. RAC04-3.3SC/230, 3.3VDC single output
- e.g. RAC04-05DC/230, 5VDC dual output

PREFERRED ALTERNATIVES
Please consider these alternatives:

RAC04-K/277 Series

RAC10-K/277 Series

- IEC/EN60950-1 certified
- IEC/EN62368-1 certified
- UL60950-1 certified
- CSA/CAN 22.2 60950-1-07 certified
- CB Report
- EN55032 compliance
- EN55024 compliance

Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range ⁽²⁾		80VAC 113VDC		264VAC 373VDC
Input Current	115VAC 230VAC			98mA 64mA
Inrush Current	<0.5ms cold start at 25°C	115VAC 230VAC		15A 30A
No load Power Consumption	115VAC/230VAC			100mW
Input Frequency Range	AC Input	47Hz		440Hz
Hold-up time	115VAC		15ms	
Internal Operating Frequency	100% load at nominal Vin		67kHz	
Minimum Load		0%		
Output Ripple and Noise ⁽³⁾			200mVp-p	

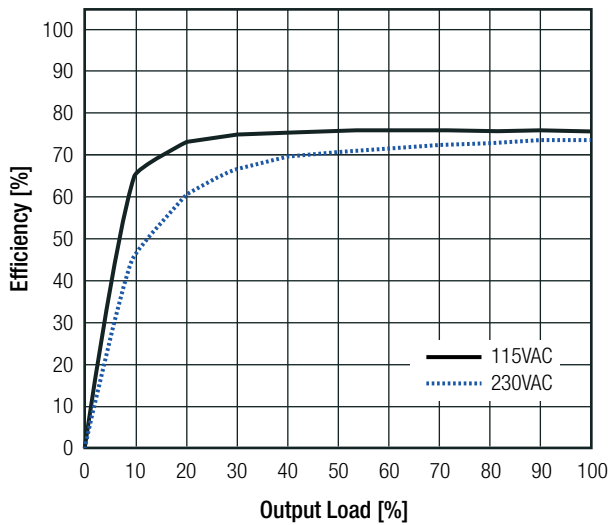
Notes:

Note2: Refer to line derating graph on page PA-4

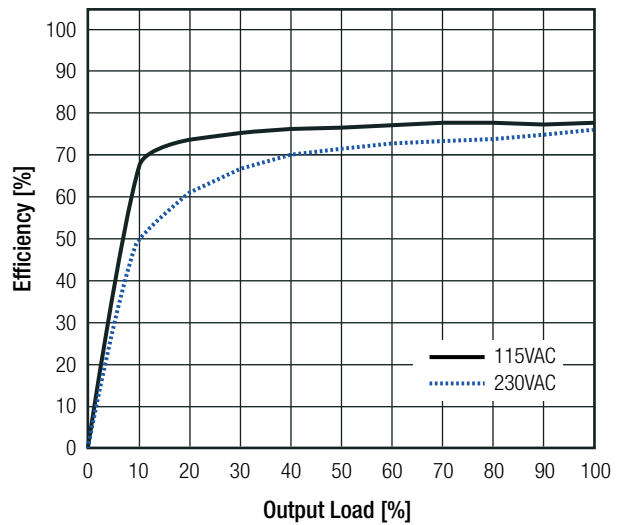
Note3: Ripple and Noise is measured at 20MHz bandwidth and with a 47µF low-ESR electrolytic capacitor in parallel with a 0.1µF ceramic capacitor across output

Efficiency vs. Load

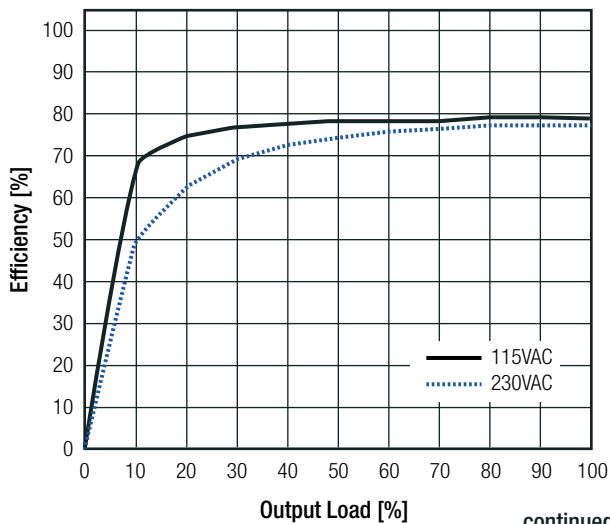
RAC04-3.3SC/230



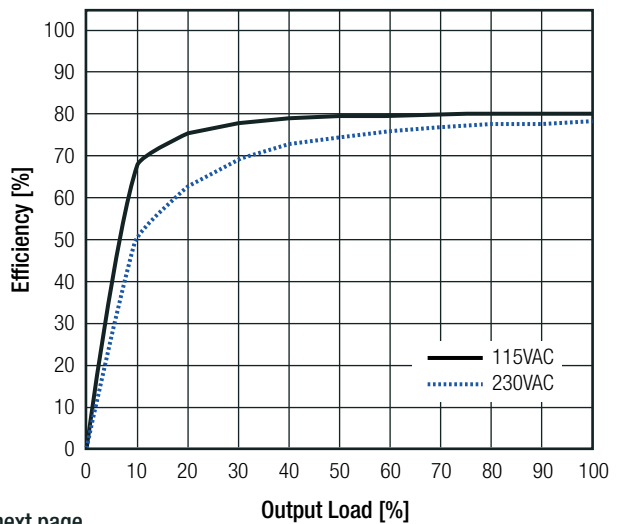
RAC04-05SC/230



RAC04-12SC/230

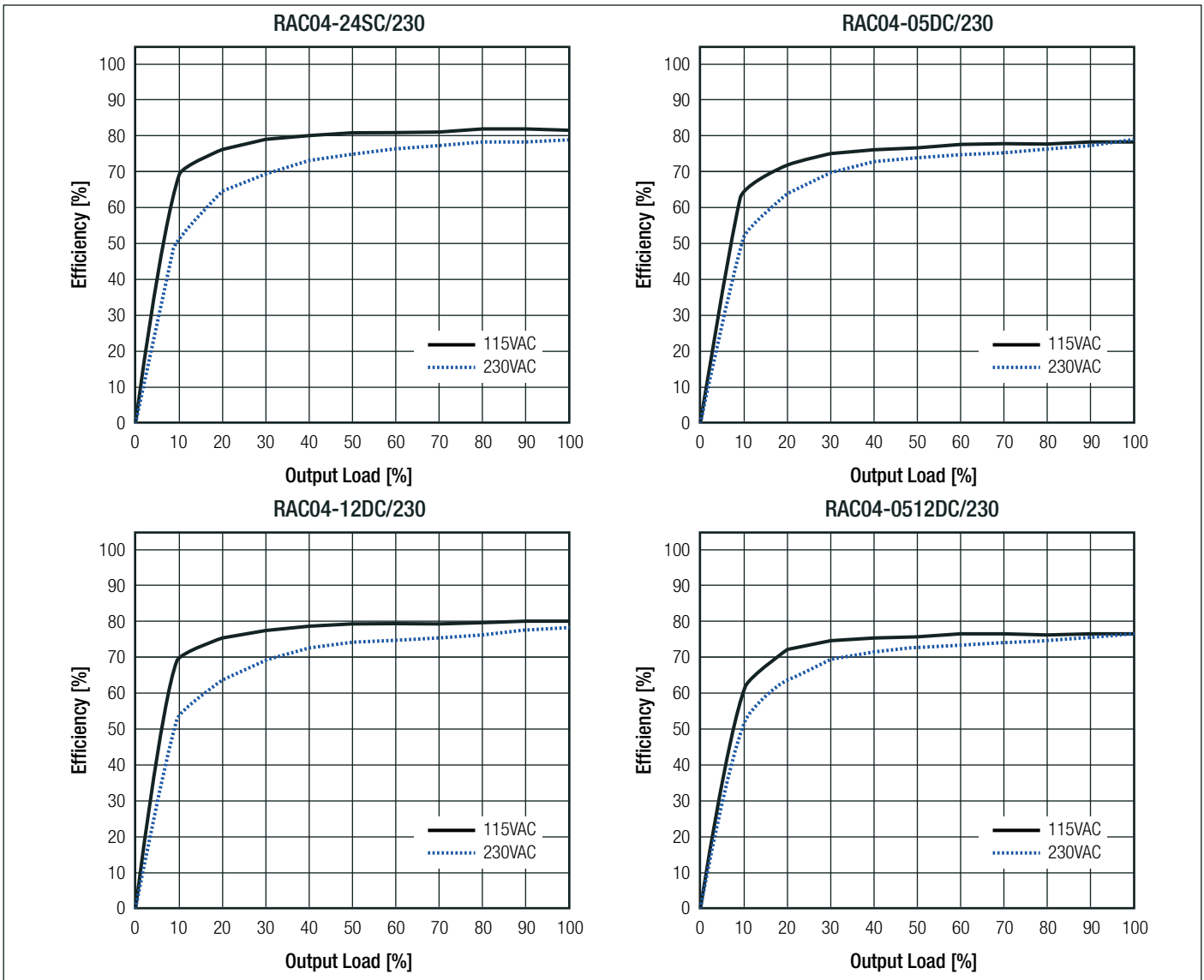


RAC04-15SC/230



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Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)



REGULATIONS

Parameter	Condition		Value
Output Accuracy	single and dual 5V/12V dual assymetrical		±2.0% typ. ±2.0% / ±10.0% typ.
Line Regulation	90-264VAC	single and dual 5V/12V dual assymetrical	±0.2% typ. ±0.2% / ±1.0% typ.
Load Regulation	10% to 100% load	3.3V, 5V output all others 5V/12V dual assymetrical	1.0% typ. 0.5% typ. 1.0% / 5.0% typ.

PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)			automatic recovery
Over Voltage Category			OVC II
Isolation Voltage	I/P to O/P	tested for 1 minute	3.75kVAC
Isolation Resistance			100MΩ min.
Insulation Grade			reinforced
Leakage Current	230VAC / 50Hz		0.25mA max.

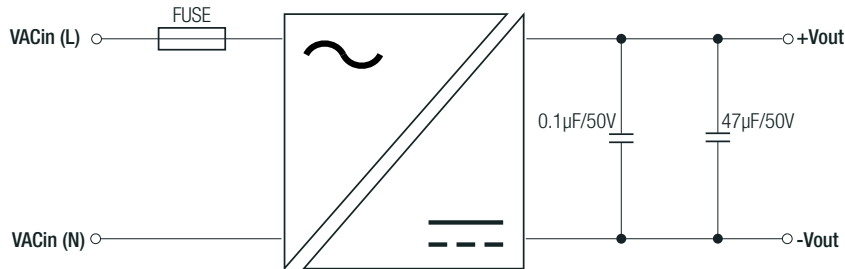
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Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

Notes:

Note4: Refer to local safety regulations if input over-current protection is also required

Protection Circuit

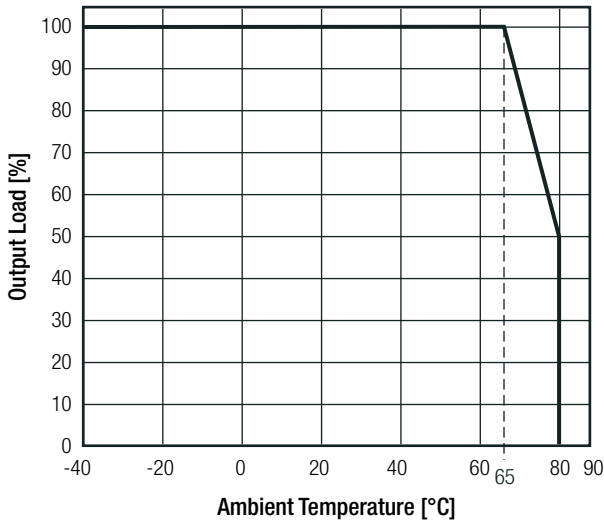


ENVIRONMENTAL

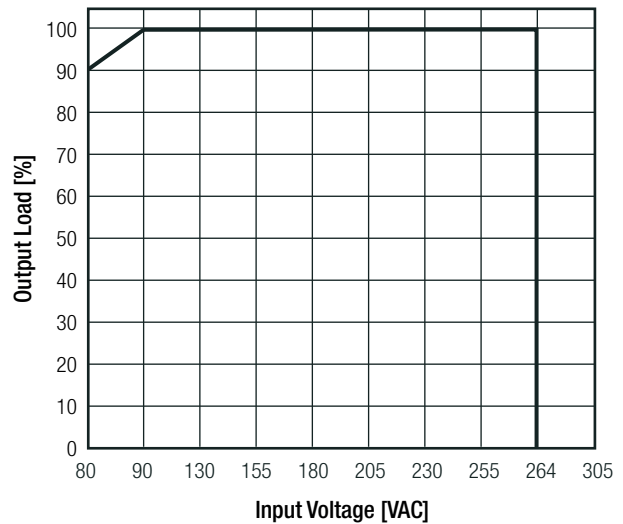
Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/s	full load	-40°C to +65°C
		refer to derating graph	-40°C to +80°C
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
Vibration			according to MIL-STD-810F standard
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	500 x 10 ³ hours

Derating Graph

(@ Chamber and natural convection 0.1m/s)



Line Derating



SAFETY AND CERTIFICATIONS

Certificate Type	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety (CB Scheme)	1310055-1-CB-M1	IEC60950-1:2005, 2nd Edition + A1:2009
Information Technology Equipment, General Requirements for Safety	E224736-A21	UL60950-1, 2nd Edition 2011 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2011
Audio/video, information and communication technology equipment - Safety requirements	AL106051	EN62368-1:2014 IEC62368-1:2014 2nd Edition
EAC	RU-AT.03.67361	TP TC 004/020, 2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863

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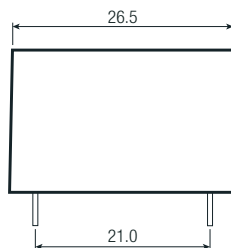
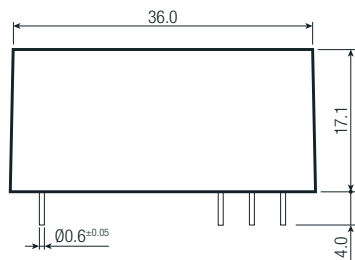
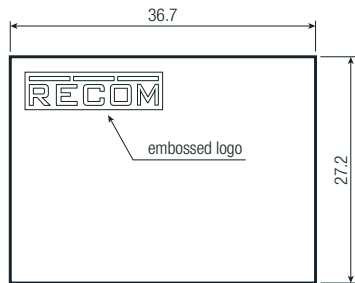
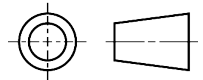
Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

EMC Compliance	Report / File Number	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	T160225D10-E	EN55032, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010
ESD Electrostatic discharge immunity test	Air: ±2, 4, 8kV Contact: ±4kV	IEC61000-4-2:2008, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1kV	IEC61000-4-4:2004 + A1:2010, Criteria A
Surge Immunity	AC Power Port: L-N ±1kV	IEC61000-4-5:2005, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V	IEC61000-4-6:2008, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	IEC61000-4-8:2009, Criteria A
Voltage Dips and Interruptions	Voltage Dips: >95%	IEC61000-4-11:2004, Criteria A
	Voltage Dips: 30%	IEC61000-4-11:2004, Criteria A
	Interruptions: >95%	IEC61000-4-11:2004, Criteria B

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB	black plastic (JL94 V-0) silicone (JL94 V-0) FR4 (JL94 V-0)
Dimension (LxWxH)		36.7 x 27.2 x 17.1mm
Weight		31.5g typ.

Dimension Drawing (mm)



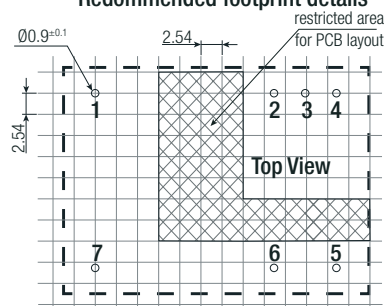
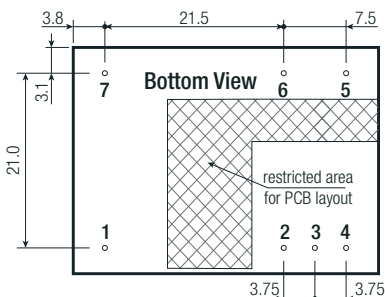
Pinning information

Pin #	Single	Dual	Dual (assymetric)
1	No Pin	No Pin	No Pin
2	+Vout	+Vout	+5Vout
3	-Vout	Com	Com
4	NC	-Vout	+12Vout
5	VAC in (L)	VAC in (L)	VAC in (L)
6	VAC in (N)	VAC in (N)	VAC in (N)
7	NC*	NC*	NC*

*Pin 7 is NC but need 4mm minimum clearance to ground for safety

NC= no connection
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

Redommended footprint details



Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)**PACKAGING INFORMATION**

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	520.0 x 32.0 x 27.0mm
Packaging Quantity		12pcs
Storage Temperature Range		-40°C to +100°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.

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