Features

Regulated Converters

- Ultracompact AC-DC power supply
- Universal input 80-264VAC or 115-370VDC
- Class II power supply with 3kVAC isolation
- Low cost AC/DC power supply
- Short circuit & over current protected
- IEC/EN/UL60950 certified

RECOM

AC/DC Converter

RAC04-C

4 Watt Single Output

IEC/EN60950-1 certified
UL60950-1 certified
CAN/CSA-C22.2 No. 60950-1 certified
EN55032 compliant
EN55024 compliant
CB-Report

Description

The new RAC04-SC modules are available with output voltages of 3.3, 5, 9, 12, 15, and 24V, and the input-to-output isolation is approximately 3kVAC/1min. With a standby consumption of typical 100mW, the mini power supplies are particularly suitable for energy-saving sleep mode and standby applications. Because of its compact design (height <17 mm), 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 EN55032, 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 (1) [%]	Max. Capacitive Load (2,3) [µF]
RAC04-3.3SC	80-264	3.3	1200	67	5600
RAC04-05SC	80-264	5	800	72	2000
RAC04-09SC	80-264	9	444	76	1500
RAC04-12SC	80-264	12	333	74	560
RAC04-15SC	80-264	15	267	77	470
RAC04-24SC	80-264	24	167	79	150

Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient
Note2: Measured @ 230VAC / 50Hz / Ta=25°C with constant resistant mode at full load
Note3: If used @ 115VAC / 60Hz with full load, max. capacitive load is less, please contact RECOM Techsupport for detailed information

Model Numbering

RAC04-__ SC

nom. Output Power
nom. Output Voltage
Single

Ordering Examples:

RAC04-05SC	4 Watt	5Vout	Single Output
RAC04-12SC	4 Watt	12Vout	Single Output

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

BASIC CHARACTERISTICS					
Parameter	**Condition**		**Min.**	**Typ.**	**Max.**
Input Voltage Range (4,5)	nom. Vin = 230VAC		80VAC 115VDC		264VAC 370VDC
Input Current	115VAC 230VAC				110mA 72mA
Inrush Current	<0.5ms cold start at +25°C	115VAC 230VAC			30A 60A
No load Power Consumption	80-264VAC				200mW
Input Frequency Range	AC Input		47Hz		63Hz
Minimum Load (7)			10%		

continued on next page

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

BASIC CHARACTERISTICS

Parameter	Condition		Min.	Typ.	Max.
Internal Operating Frequency	100% load at nominal Vin			40kHz	
Output Ripple and Noise [6]	20MHz BW	115VAC/230VAC			200mVp-p

Notes:

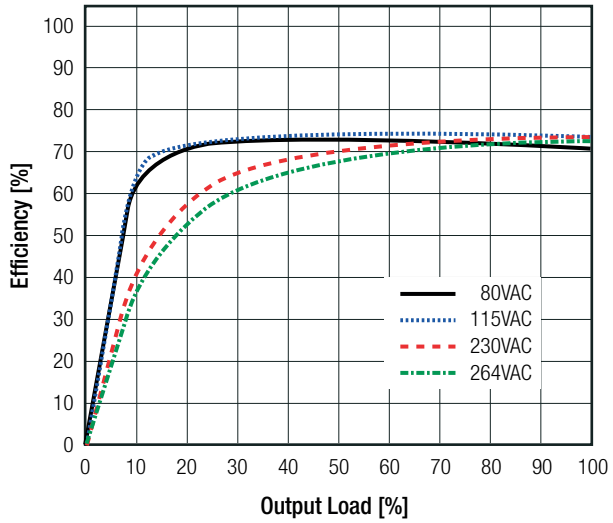
Note4: The products were submitted for safety files at AC-Input operation

Note5: Refer to line derating graph on page PA-3

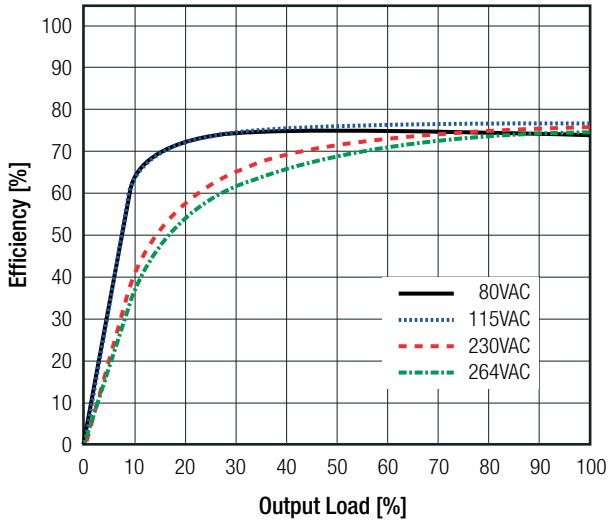
Note6: Measurements are made with a 0.1µF MLCC across output (low ESR)

Efficiency vs. Load

RAC04-05SC



RAC04-12SC



REGULATIONS

Parameter	Condition	Value
Output Accuracy		±2.0% typ./ ±5.0% max.
Line Regulation	low line to high line	±0.5% typ./ ±1.0% max.
Load Regulation [7]	10% to 100% load	1.5% typ./ 5.0% max.

Notes:

Note7: Operation below 10% load will not harm the converter, but specifications may not be met

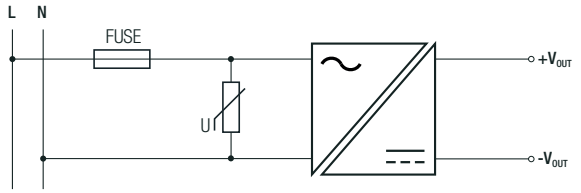
PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ		Hiccup mode, automatic recovery
Over Voltage Category			OVCII
Over Current Limit			105% - 155%
Isolation Voltage	I/P to O/P	tested for 1 minute	3kVAC
Isolation Resistance			1GΩ min.
Isolation Capacitance			1000pF typ.
Leakage Current			0.85mA max.

Notes:

Note8: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

Note9: MOV required for 230VAC operation. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 Series

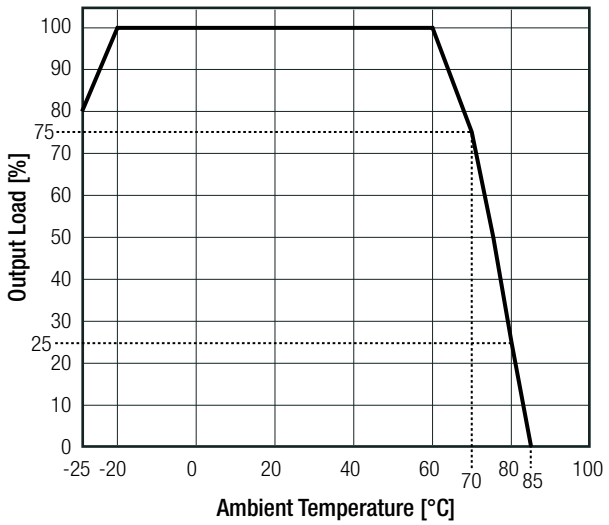


Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

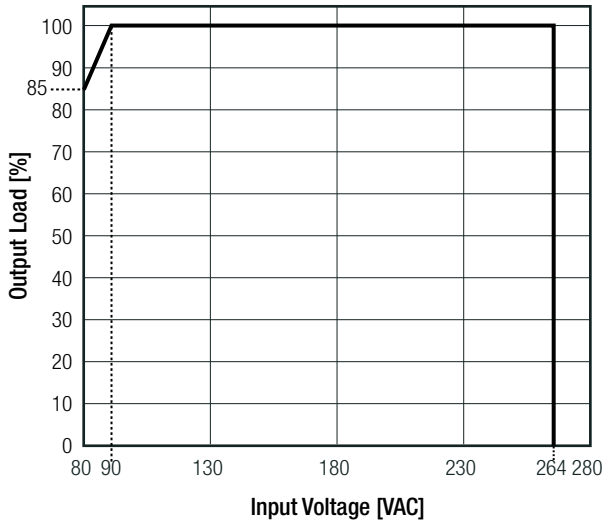
ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/s	full load	-25°C to +60°C
		refer to derating graph	-25°C to +85°C
Maximum Case Temperature			+100°C
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
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 (Safety)	Report / File Number	Standard
Information Technology Equipment - General Requirments for Safety	SPCLVD1606038	IEC60950-1:2005 2nd Edition + 2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment - General Requirments for Safety (CB Scheme)	L0339m10-CB-1-B1	IEC60950-1:2005 2nd Edition + A2:2013
Information Technology Equipment - General Requirments for Safety		EN60950-1:2006 + A2:2013
Information Technology Equipment - General Requirments for Safety	E224736-A5-UL	CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2007 UL No. 60950-1, 2nd Edition, 2007
EAC Safety of Low Voltage Equipment	RU-AT.49.09571	TP TC 004/2011
RoHS 2+		RoHS-2011/65/EU + AM-2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55032:2015, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD Electrostatic discharge immunity test	Air ±8.0kV; Contact ±4.0kV	IEC61000-4-2:2008, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1.0kV	IEC61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port: L-N ±1.0kV	IEC61000-4-5:2005, Criteria A

continued on next page

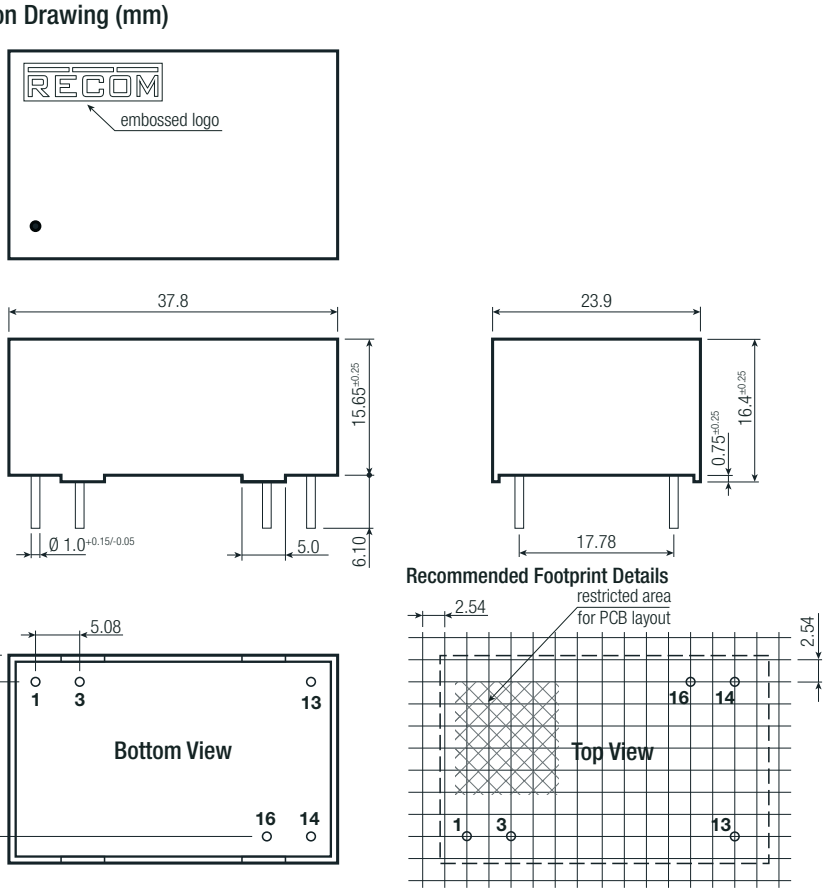
Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

EMC Compliance	Condition	Standard / Criterion
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3.0V	IEC61000-4-6:2008, Criteria A
Voltage Dips and Interruptions	Voltage Dips >95% Voltage Dips 30% Voltage Interruptions > 95%	IEC61000-4-11:2004, Criteria A IEC61000-4-11:2004, Criteria A IEC61000-4-11:2004, Criteria C
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting	black plastic (UL94V-0) silicone (UL94V-0)
Dimension (LxWxH)		37.8 x 23.9 x 16.4mm
Weight		30g typ.

Dimension Drawing (mm)



Pin Connections

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

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

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	520.0 x 32.0 x 27.0mm
Packaging Quantity		12pcs
Storage Temperature Range	non-condensing	-40°C to +100°C
Storage Humidity		95% RH max.