Features

Regulated Converters

- Compact low profile AC-DC power supply
- 30mW no load power consumption
- Class II power supply with 3kVAC isolation
- Universal input voltage range (80~264VAC)
- Low output ripple/noise
- EN, UL and CE certified

RECOM

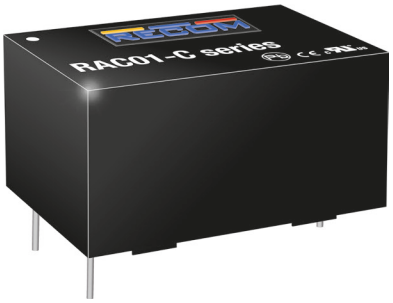
AC/DC Converter

RAC01-C
RAC02-C

1-2 Watt Single Output

Description

The RAC01-SC and RAC02-SC series are ultra-compact universal input AC/DC power modules for PCB mounting. They feature high efficiency, low standby power, high operating temperature, soft start and short-circuit protection as well as a built-in EMC Class B filter. Output voltages range from 3.3VDC to 24VDC.



Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ [%]	Max. Capacitive Load (1,2) [µF]
RAC01-3.3SC	80-264	3.3	300	65	2200
RAC01-05SC	80-264	5	200	68	1600
RAC01-09SC	80-264	9	111	70	470
RAC01-12SC	80-264	12	83	72	180
RAC01-15SC	80-264	15	67	72	180
RAC01-24SC	80-264	24	42	73	68
RAC02-3.3SC	80-264	3.3	600	66	2700
RAC02-05SC	80-264	5	400	70	2000
RAC02-09SC	80-264	9	222	72	560
RAC02-12SC	80-264	12	167	74	200
RAC02-15SC	80-264	15	133	74	200
RAC02-24SC	80-264	24	83	77	68

Notes:

Note1: Measured @ 230VAC / 50Hz / Ta=25°C with constant resistive load

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

Model Numbering

RAC0_-__C

nom. Output Power (3)

nom. Output Voltage

Single

Notes:

Note3: „1“ for 1 Watt, „2“ for 2 Watt

Ordering Examples:

RAC01-12SC	1 Watt	12Vout	Single Output
RAC01-05SC	1 Watt	5Vout	Single Output
RAC02-3.3SC	2 Watt	3.3Vout	Single Output
RAC02-24SC	2 Watt	24Vout	Single Output

EN60950-1 certified
UL60950-1 certified
***EN60335-1 certified (only 2W version)**

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

BASIC CHARACTERISTICS					
Parameter	**Condition**		**Min.**	**Typ.**	**Max.**
Input Voltage Range [4]	nom. Vin = 230VAC		80VAC 115VDC		264VAC 370VDC
Input Current	RAC01-C	115VAC 230VAC			34mA 23mA
	RAC02-C	115VAC 230VAC			55mA 36mA
Inrush Current	<0.5ms cold start at 25°C	115VAC 230VAC			30A 60A
No load Power Consumption	115VAC 230VAC			30mW 80mW	
Input Frequency Range	AC Input		47Hz		63Hz
Minimum Load [5]				0%	
Start-up Time	115VAC 230VAC			3ms 1.5ms	
Rise Time	115VAC/ 230VAC			20ms	
Hold-up time	115VAC 230VAC			10ms 60ms	
Internal Operating Frequency	100% load at nominal Vin			30kHz	
Output Ripple and Noise [6]	20MHz BW	3.3Vout all others			150mVp-p 100mVp-p

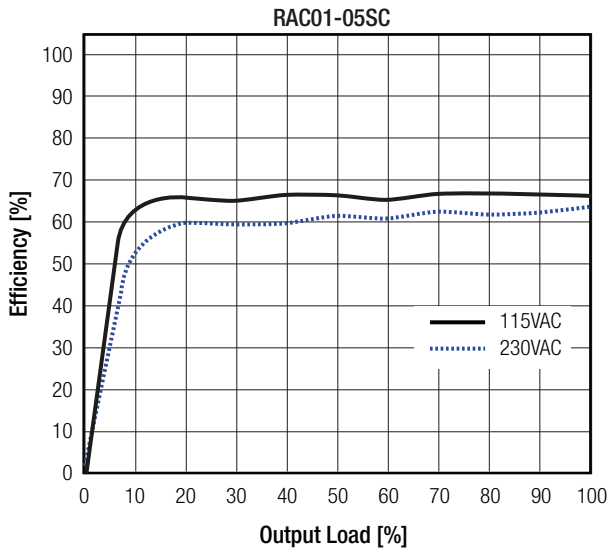
Notes:

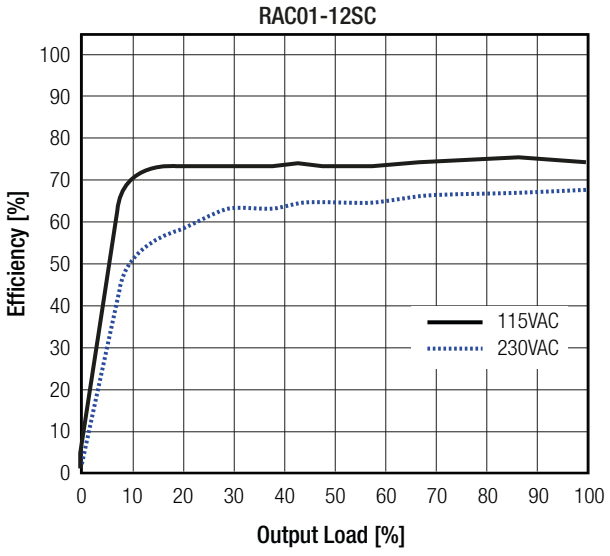
Note4: Refer to line derating graph on page 3

Note5: Operation below 10% load won't harm the converter, but specifications may not be met

Note6: Ripple and Noise is the maximum peak-to-peak voltage value measured at the output with a 20MHz bandwidth, at rated line voltage and full load

Efficiency vs. Load





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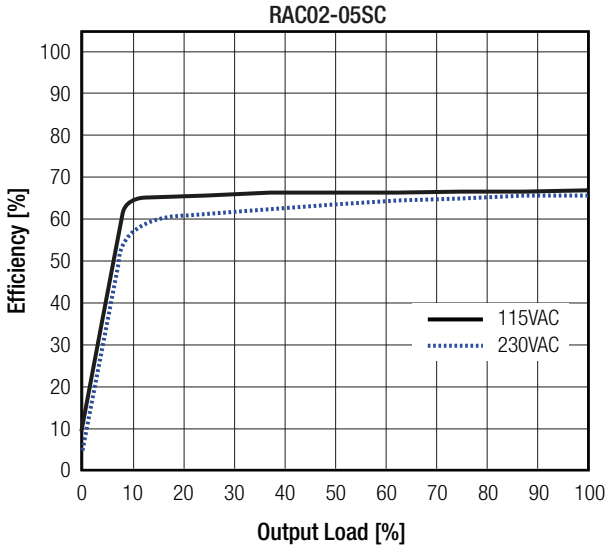
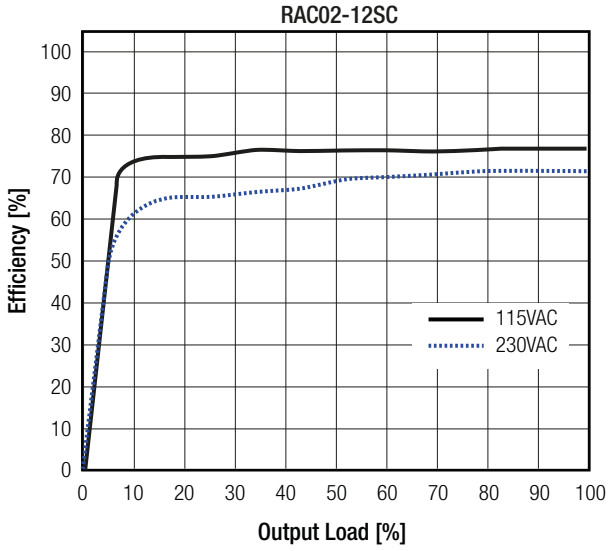
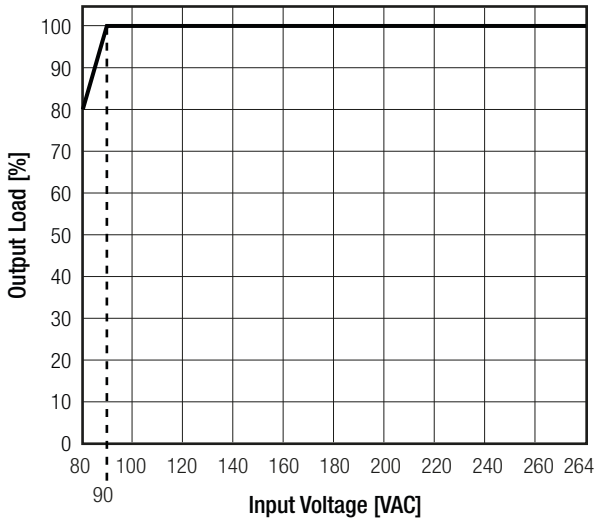
Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)





Line Derating



REGULATIONS		
Parameter	**Condition**	**Value**
Output Accuracy		±5.0% typ.
Line Regulation	low line to high line	±2.0% max.
Load Regulation	10% to 100% load	6.0% max.

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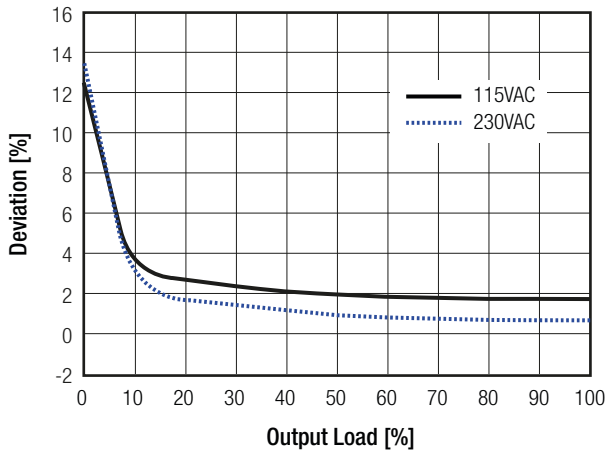
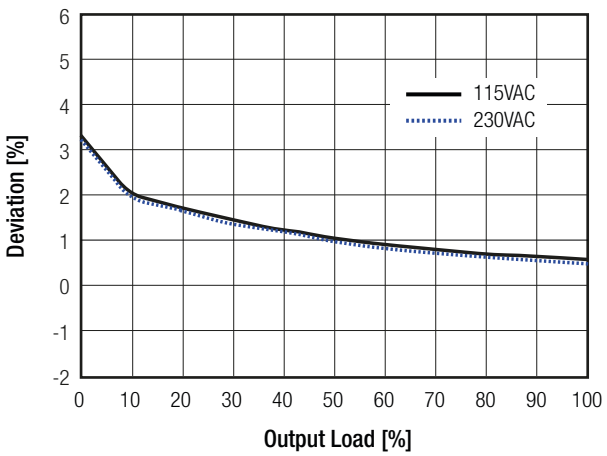
Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

Deviation vs. Load

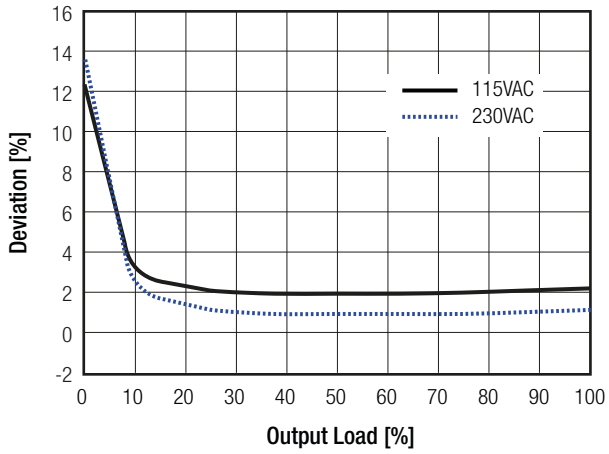
RAC01-05SC



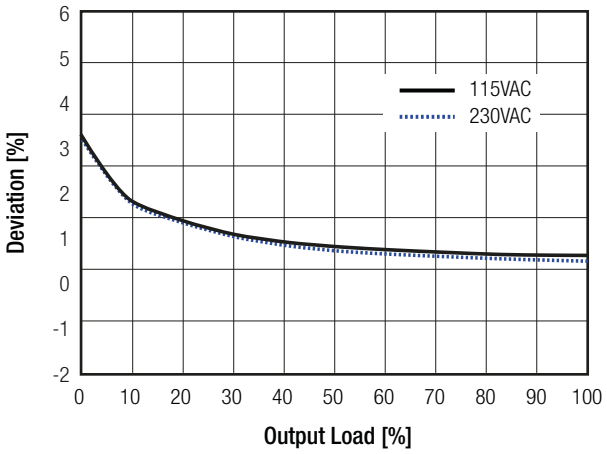
RAC01-12SC



RAC02-05SC



RAC02-12SC



PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ		Hiccup mode, automatic recovery
Over Voltage Category			OVCII
Class of Equipment			Class II
Isolation Voltage	I/P to O/P	rated for 1 minute	3kVAC
Isolation Resistance			1GΩ min.
Isolation Capacitance			1000pF max.
Insulation Grade			reinforced
Leakage Current			0.25mA max.

Notes:

Note7: Refer to local wiring regulations if input over-current protection is also required

Note8: An external MOV is recommended for operation 230VAC. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 Series

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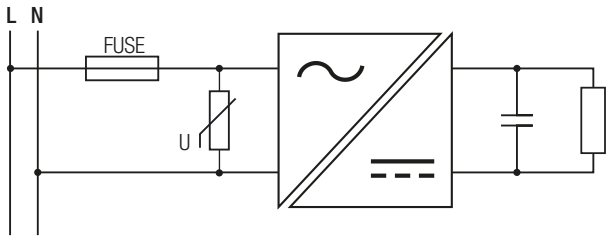
Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

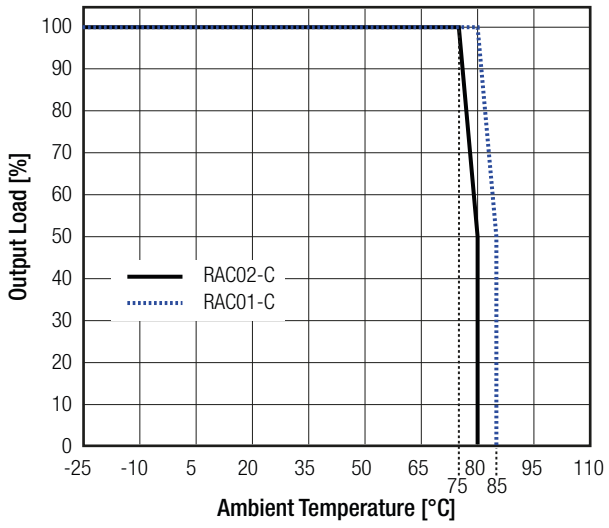
Protection Circuit



ENVIRONMENTAL				
Parameter	**Condition**			**Value**
Operating Temperature Range	@ natural convection 0.1m/s	full load	RAC01-C	-25°C to +80°C
			RAC02-C	-25°C to +75°C
		refer to derating graph		-25°C to +85°C
Maximum Case Temperature				+95°C
Temperature Coefficient	+25°C to +75°C			0.1%°C
Thermal Impedance	0.1m/s, horizontal			27°C/W
Operating Altitude				2000m
Operating Humidity	non-condensing			95% RH max.
Pollution Degree				PD2
Vibration				according to MIL-STD-810F
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +55°C +80°C		666 x 10^3 hours 395 x 10^3 hours 125 x 10^3 hours

Derating Graph

(@ Chamber and natural convection 0.1m/s)



Notes:

Note9: Start-up is only guaranteed at temperatures down to -25°C; otherwise specifications may not be met

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

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report / File Number**	**Standard**
Information Technology Equipment - General Requirments for Safety	1606038	EN60950-1:2006 + A2:2013 IEC60950-1:2005, 2nd Edition + 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 Requirements for Safety	E224736-A5	UL60950-1, 2nd Edition, 2007 CSA C22.2 60950-1, 2nd Edition, 2007
Household and similar electrical appliances - Safety - Part 1: General requirements (10)	L0339L26-B2-L	EN60335-1:2012 + A11:2014
EAC Safety of Low Voltage Equipment	RU-AT.49.09571	TP TC 004/2011
RoHS2		RoHS-2011/65/EU + AM-2015/863

EMC Compliance (Industrial)	**Condition**	**Standard / Criterion**
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55032:2015
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD Electrostatic discharge immunity test	±8kV air, ±4kV contact	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
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port 3Vr.m.s.	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

EMC Compliance (Household) only 2Watt version	**Condition**	**Standard / Criterion**
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission		EN55014-1:2006+A2:2011
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55014-2:2015
ESD Electrostatic discharge immunity test	±8kV air, ±4kV contact	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: ±1kV DC Output: ±0.5kV	EC61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port:L to N ±2kV DC Output: L to N ±1kV	IEC61000-4-5:2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	3 Vr.m.s.	IEC61000-4-6:2013, Criteria A
Voltage Dips and Interruptions	Voltage Dips >95% Voltage Dips 30% Voltage Interruptions >95%	IEC61000-4-11:2004, Criteria B IEC61000-4-11:2004, Criteria C IEC61000-4-11:2004, Criteria C
Limits of Harmonic Current Emissions		EN61000-3-2:2014
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

Notes:

Note10: RAC01-C series is excluded

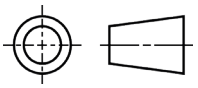
RAC01-C
RAC02-C

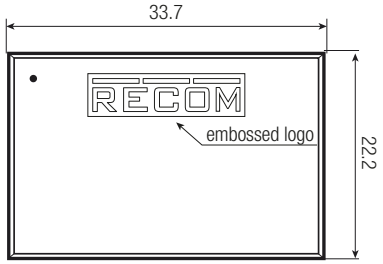
Specifications (measured at Ta= 25°C, nominal input voltage, full load otherwise noted)

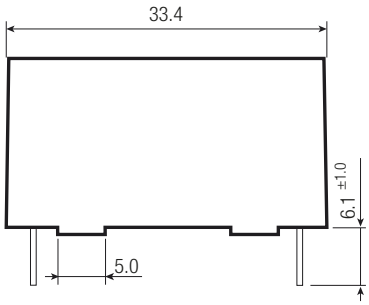
DIMENSION AND PHYSICAL CHARACTERISTICS

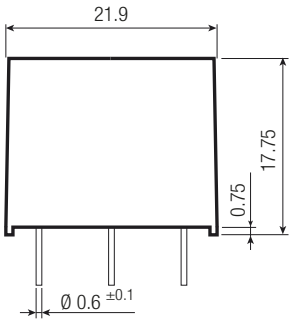
Parameter	Type	Value
Material	case potting PCB	black plastic (UL94V-0) silicone (UL94V-0) FR4, (UL94V-1)
Dimension (LxWxH)		33.7 x 22.2 x 17.75mm
Weight		25g typ.

Dimension Drawing (mm)





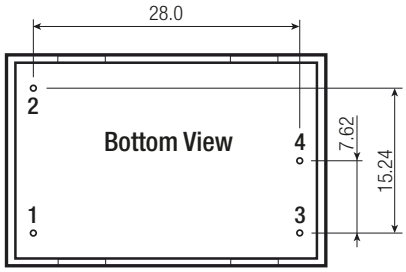




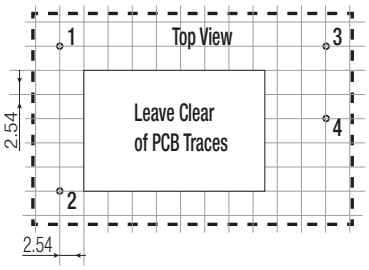
Pin Connections

Pin #	Single
1	VAC in (N)
2	VAC in (L)
3	-Vout
4	+Vout

Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm



Recommended Footprint Details



Allow 5mm clearance around converter for air circulation

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	520.0 x 37.0 x 28.0mm
Packaging Quantity		22pcs
Storage Temperature Range		-40°C to +100°C
Storage Humidity	non-condensing	95% RH max.