

# Features

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

# Regulated Converters



## RAC03-C

**3 Watt  
Single  
Output**



IEC/EN60950-1 certified  
 UL60950-1 certified  
 CAN/CSA-C22.2 No. 60950-1 certified  
 IEC/EN60335-1 certified  
 EN55032/14 compliant  
 EN55024 compliant  
 CB-Report

### Description

The RAC03-C series is an ultra-compact universal input AC/DC power module for PCB mounting. It features high efficiency, low standby power, high operating temperature, soft start, low output ripple/noise, overload and short-circuit protection as well as a built-in EMC Class B filter. Output voltages range from 3.3VDC to 24VDC, including a 3.8VDC version designed for battery chargers and GSM modems.

### Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ <sup>(1)</sup> [%]	Max. Capacitive Load <sup>(2,3)</sup> [µF]
RAC03-3.3SC	80-264	3.3	900	67	6800
RAC03-3.8SC	80-264	3.8	789	67	6800
RAC03-05SC	80-264	5	600	72	4000
RAC03-09SC	80-264	9	333	76	3000
RAC03-12SC	80-264	12	250	76	680
RAC03-15SC	80-264	15	200	76	470
RAC03-24SC	80-264	24	125	78	200

#### 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



#### Ordering Examples:

RAC3-3.3SC	3 Watt	3.3Vout	Single Output
RAC3-24SC	3 Watt	24Vout	Single Output

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

**BASIC CHARACTERISTICS**

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range <sup>(4,5)</sup>	nom. Vin = 230VAC	80VAC 115VDC		264VAC 370VDC
Input Current	115VAC 230VAC			85mA 40mA
Inrush Current	<0.5ms 115VAC 230VAC			30A 60A
No load Power Consumption	115VAC 230VAC			60mW 100mW
Input Frequency Range	AC Input	47Hz		63Hz
Minimum Load		0%		
Start-up Time	115VAC 230VAC			0.5s 0.2s
Rise Time	115VAC 230VAC		20ms 20ms	
Hold-up time	115VAC 230VAC	15ms 80ms		
Internal Operating Frequency	100% load at nominal Vin		35kHz	
Output Ripple and Noise <sup>(6)</sup>	20MHz BW 3.3, 3.8, 5Vout all others			120mVp-p 150mVp-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**



**REGULATIONS**

Parameter	Condition	Value
Output Accuracy		±5.0% max.
Line Regulation	low line to high line	±3.0% max.
Load Regulation <sup>(7)</sup>	10% to 100% load	6.0% max.

**Notes:**

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

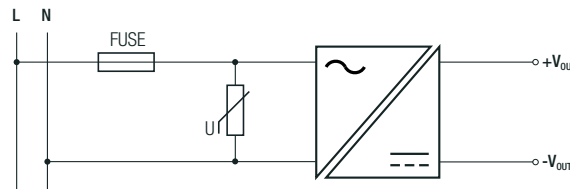
Specifications (measured at Ta= 25°C, full load otherwise noted)

PROTECTIONS			
Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ		Hiccup mode, automatic recovery
Over Voltage Category			OVCII
Isolation Voltage	I/P to O/P	tested for 1 minute	3kVAC
Isolation Resistance	I/P to O/P		1GΩ min.
Isolation Capacitance			1000pF typ.
Insulation Grade			double insulated
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

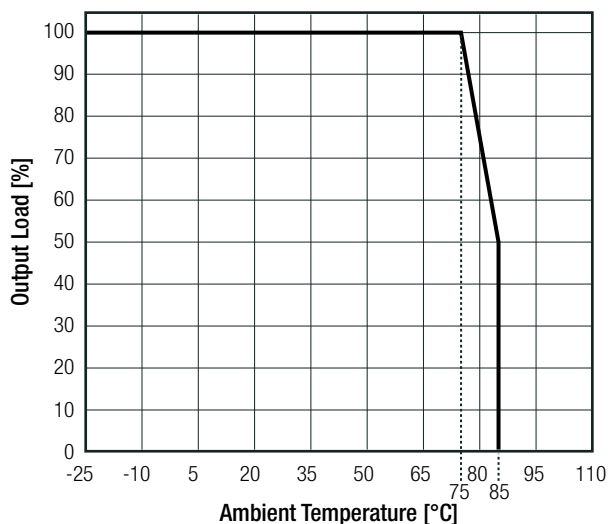
Note9: MOV required for 230VAC operation. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 Series



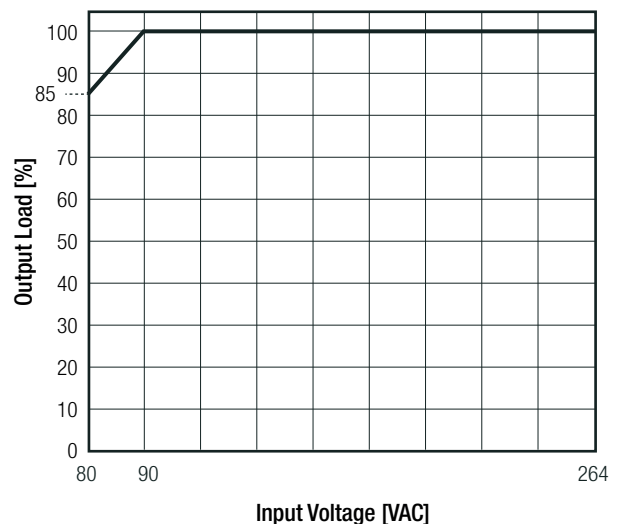
ENVIRONMENTAL			
Parameter	Condition		Value
Operating Temperature Range <sup>(8)</sup>	@ natural convection 0.1m/s	full load	-25°C to +75°C
		refer to derating graph	-25°C to +85°C
Maximum Case Temperature			+100°C
Temperature Coefficient	+25°C to +75°C		0.07%/K
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	550 x 10 <sup>3</sup> hours
		+80°C	76 x 10 <sup>3</sup> hours

**Derating Graph**

(@ Chamber and natural convection 0.1m/s)



**Line Derating**



**Specifications (measured at Ta= 25°C, full load otherwise noted)**

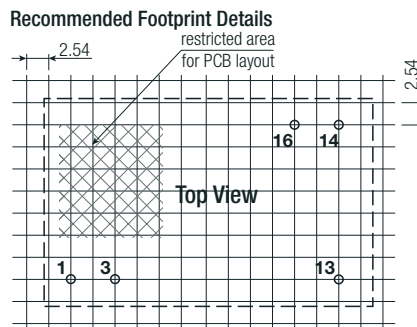
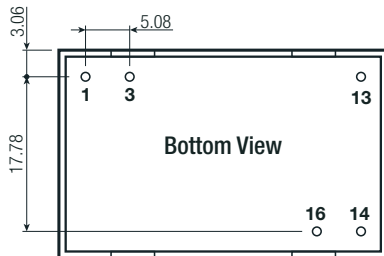
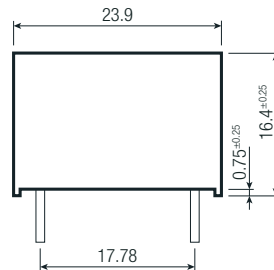
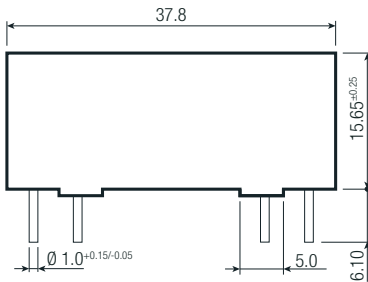
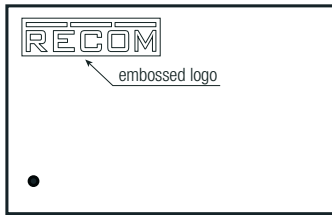
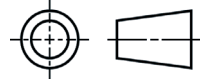
<b>SAFETY AND CERTIFICATIONS</b>		
<b>Certificate Type (Safety)</b>	<b>Report / File Number</b>	<b>Standard</b>
Information Technology Equipment - General Requirments for Safety	SPCLVD1606038	IEC60950-1:2006 + A2:2013 EN60950-1, 2nd Edition , 2013
Household and similar electrical appliances – Safety – Part 1: General requirements	L0339L26-B2-L	IEC60335-1:2010+AMD1:2013 EN60335-1:2012+A11:2014
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 <sup>(10)</sup>	UL60950-1, 2nd Edition, 2007 CSA C22.2 60950-1, 2nd Edition, 2007
EAC Safety of Low Voltage Equipment	RU-AT.49.09571	TP TC 004/2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863
<b>EMC Compliance Industrial</b>	<b>Condition</b>	<b>Standard / Criterion</b>
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
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%	IEC61000-4-11:2004, Criteria A
	Voltage Dips 30%	IEC61000-4-11:2004, Criteria A
	Voltage Interruptions > 95%	IEC61000-4-11:2004, Criteria C
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013
<b>EMC Compliance Household</b>	<b>Condition</b>	<b>Standard / Criterion</b>
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission		EN55014-1:2006+A2:2011
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity		EN55014-2:2015
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 DC Output: ±0.5kV	IEC61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port: L-N ±2.0kV DC Output: L-N ±1.0kV	IEC61000-4-5:2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V DC Output: 3V	IEC61000-4-6:2013, Criteria A
Voltage Dips and Interruptions	Voltage Dips >95%	IEC61000-4-11:2004, Criteria B
	Voltage Dips 30%	IEC61000-4-11:2004, Criteria C
	Voltage Interruptions > 95%	IEC61000-4-11:2004, Criteria C
Limits of Harmonic Current Emissions		EN61000-3-2:2014
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013
<b>Notes:</b>		
Note10: UL is pending for RAC03-3.8SC		

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

**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	-Vout
16	+Vout

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		-40°C to +100°C
Storage Humidity	non-condensing	95% RH max.

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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

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