## **Features**

- Universal Input 85-305VAC
- 3W PCB Mount Package
- <75mW No Load Power Consumption
- Regulated Converters
- -40°C to +85°C Operating Temperature

• Ultra Low Profile, Compact Size

#### Continuous SCP, OCP, OVP

• EN60335, IEC/EN/UL60950 & CE Certified

#### **Description**

The RAC03-GA series are low cost AC/DC power supplies, ideal for PCB mounted, compact, board level industrial applications. They feature universal AC input voltage range, regulated and short-circuit -proof isolated DC outputs, low standby power consumption and -40°C to +85°C operating temperature range. The RAC03-GA have a built-in Class A / FCC Part 15 EMC filter, are certified to IEC/EN/UL60950-1 and EN60335 and are pending to IEC/EN/UL62368 and EN61558 safety standards and come with a three year warranty.

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	Max. Capacitive Load <sup>(2)</sup> [μF]
RAC03-3.3SGA	85-305	3.3	910	70	2000
RAC03-05SGA	85-305	5	600	72	1500
RAC03-12SGA	85-305	12	250	78	500
RAC03-15SGA	85-305	15	200	78	200
RAC03-24SGA	85-305	24	130	80	150

#### On Request

RAC03-09SGA

Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient Note2: Max. Cap. Load is tested at nominal input and full resistive load

#### **Model Numbering**

Output Power

Output Voltage-

85-305

SGA

EMC Class A

77

1000

Ordering Example

RAC03-12SGA = 3W Output Power, 12V Output Voltage, Single Output, EMC Class A

Specifications (measured @ ta=25°C, nom. Vin, full load unless otherwise noted)

9

BASIC CHARACTERISTIC	CS				
Parameter	Condition		Min.	Тур.	Max.
Internal Input Filter					Pi-Type
Input Voltage Range	refer to line derating graph on PA 4		85VAC 120VDC		305VAC 430VDC
Input Current	115VAC 230VAC			70mA 45mA	
Inrush Current	cold start at 25°C	115VAC 230VAC			10A 20A
No Load Power Consumption					75mW
Input Frequency Range	AC Input		45Hz		65Hz
Minimum Load			0%		
Power Factor	115VAC 230VAC			0.53 0.41	
Start-up Time	115VAC, 230VAC			30ms	1s
Hold-up Time	115VAC 230VAC			5ms 40ms	
Internal Operating Frequency	100% load at nominal Vin			65kHz	
	continue	d on next p	age		



### RAC03-GA

3 Watt Single Output EMC Class A





UL60950-1 Certified IEC/EN60950-1 Certified UL62368-1 Pending IEC/EN62368-1 Pending EN61558-1 Pending EN61558-2-16 Pending

## RECOM **AC/DC** Converter

## RAC03-GA

## **Series**

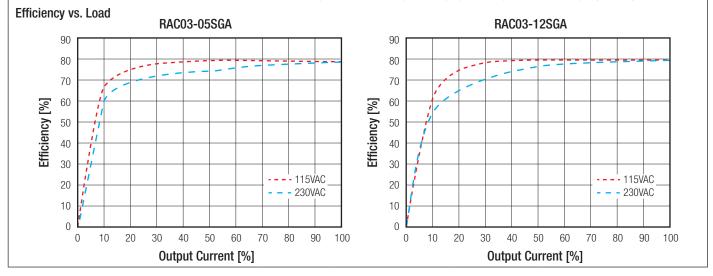
Specifications (measured @ ta=25°C, nom. Vin, full load unless otherwise noted)

Output Ripple and Noise <sup>(4)</sup> 2	20MHz BW -30°C to 0°C	0°C to 85°C	3.3, 5 Vout 12Vout 15Vout 24Vout	100mVp-p 150mVp-p 200mVp-p 240mVp-p
		-30°C to 0°C	3.3, 5Vout 12Vout 15, 24Vout	200mVp-p 250mVp-p 300mVp-p

Notes:

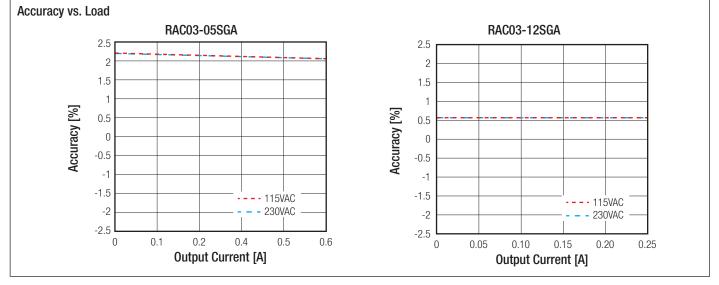
Note3: The products were submitted for safety files at AC-Input Operation

Note4: Measurements are made with a 12" twisted pair-wire with a 0.1µF and 10µF parallel capacitor across output (low ESR)



#### REGULATIONS

Parameter	Condition	Value	
Output Accuracy		±2.5% max.	
Line Regulation	low line to high line	±0.5% max.	
Load Regulation	10% to 100% load	±0.5% max.	



## RECOM AC/DC Converter

## RAC03-GA Series

Specifications (measured @ ta=25°C, nom. Vin, full load unless otherwise noted)

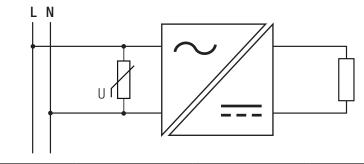
#### PROTECTIONS

Parameter		Туре	Value
Input Fuse		internal	T1A, 300V
Short Circuit Protection (SCP)	belo	ow 100mΩ	long-term mode, auto recovery
		3.3Vout	3.8V - 4.9V, hiccup mode auto recovery
		5Vout	5.3V - 6.8V, hiccup mode auto recovery
Over Voltage Protection (OVP)		12Vout	12.6V - 16.2V, hiccup mode auto recovery
		15Vout	15.75V - 20.3V, hiccup mode auto recovery
		24Vout	25.2V - 32.4V, hiccup mode auto recovery
		3.3Vout	1.41A - 3A, hiccup mode auto recovery
		5Vout	0.91A - 2.2A, hiccup mode auto recovery
Over Current Protection (OCP)		12Vout	0.37A - 0.95A, hiccup mode auto recovery
		15Vout	0.29A - 0.72A, hiccup mode auto recovery
		24Vout	0.19A - 0.45A, hiccup mode auto recovery
Class of Equipment			Class II
Over Voltage Category (OVC)			OVC II
Isolation Voltage <sup>(5)</sup>	I/P to O/P	rated for 1 minute	3kVAC/10mA
Isolation Resistance			10MΩ min.
Insulation Grade			Reinforced
Leakage Current	277	VAC, 50Hz	0.1mA max.

#### Notes:

Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage.

Note6: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC61051-2. eg. EPCOS S14 series.



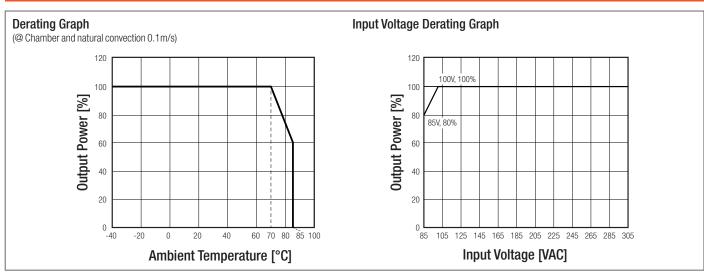
ENVIRONMENTAL				
Condition		Value		
without derating (@ natural convection 0.	1m/s, see graph)	-40°C to +70°C		
		+100°C		
		±0.03%/°C		
		3000m		
non-condensing	non-condensing			
		PD2		
		20G/11ms pulse, 3 times at each x, y, z axes		
		10-150Hz, 2G 10min./1cycle, period 60min. along x,y,z axes for 6 cycles		
according to MIL-HDBK-217F, G.B.	+25°C +70°C	100 x 10 <sup>3</sup> hours 100 x 10 <sup>3</sup> hours		
	without derating (@ natural convection 0.	without derating (@ natural convection 0.1m/s, see graph) non-condensing		

continued on next page

# RAC03-GA

### **Series**

Specifications (measured @ ta=25°C, nom. Vin, full load unless otherwise noted)

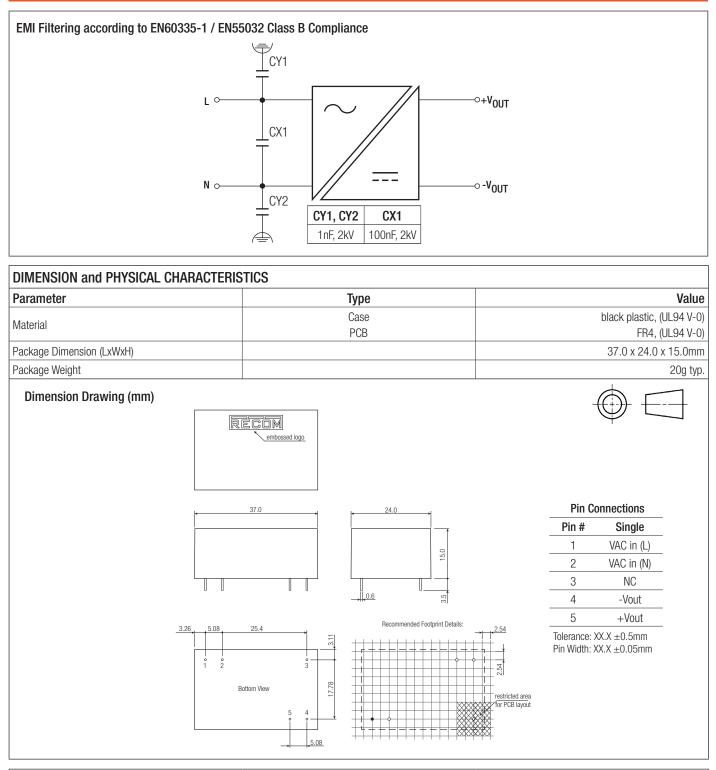


SAFETY AND CERTIFICATION Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for		IEC60950-1, 2nd Edition, 2005 + A1, 2009 + A2, 2013
Safety (LVD)	SA17031845 001	EN60950-1, 2006 + A11, 2009 + A1, 2010 + A12, 2011 + A2, 2013
Information Technology Equipment, General Requirements for Safety	E196683-A3-UL	UL60950-1, 2nd Edition, 2014 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014
Audio/video, information and communication technology equipment. Safety requirements	pending	UL62368-1 CAN/CSA C22.2 No 62368-1
Audio/video, information and communication technology equipment. Safety requirements	pending	IEC62368-1 EN62368-1
Household and similar electrical appliances - Safety. General requirements	SA1703184L 01001	EN60335, 2012 + A11, 2014
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure	SA1703184L 01001	EN62233, 2008
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V Part 2: Particular requirements	pending	EN61558-1, 2005 + A1, 2009 EN61558-2-16, 2009 + A1, 2013
RoHs 2+		RoHS 2011/65/EU + AM2015/863
EMC Compliance	Condition	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	EA1703184E 01001 with external components	EN55032, 2015, Class A
Limitations on the amount of electromagnetic intererence allowed from digital and electronic devices	EA1703184E 01001	47 CFR FCC Part 15 Subpart B: 2016
ESD Electrostatic discharge immunity test	Air $\pm$ 8kV, Contact $\pm$ 4kV	EN61000-4-2, 2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, 2006 + A1, 2008 + A2, 2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port ±1kV	EN61000-4-4, 2012, Criteria A
Surge Immunity	AC Power Port L-N ±1kV	EN61000-4-5, 2014, Criteria B
Immunity to conducted disturbances, induced by radio- frequency fields	AC Power Port 3V	EN61000-4-6, 2014, Criteria A
Voltage Dips and Interruption	Voltage Dips >95% Voltage Dips 30% Voltage Interruptions >95%	EN61000-4-11, 2004, Criteria A EN61000-4-11, 2004, Criteria A EN61000-4-11, 2004, Criteria C

## RECOM AC/DC Converter

## RAC03-GA Series

**Specifications** (measured @ ta=25°C, nom. Vin, full load unless otherwise noted)



PACKAGING INFORMATION			
Parameter	Туре	Value	
Packaging Dimension (LxWxH)	tube	505.0 x 39.7 x 23.2mm	
Packaging Quantity		20pcs	
Storage Temperature Range		-40°C to +100°C	
Storage Humidtiy	non-condensing	5% - 95% RH max.	

The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer 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.