### **Features**

# Regulated Converter

- Universal input 85-264VAC
- <150mW No load power consumption</li>
- Class II installations (without FG)
- -25°C to +80°C Operating temperature

Output

Current

[mA]

200

83

303

66

42

- Continuous SCP, OCP
- EN/IEC/UL60950, EN/IEC/UL62368 & EN60335-1 certified

Efficiency

typ (1)

[%]

63

68

63

63

63

#### **Description**

**Selection Guide** 

Input

Voltage Range

[VAC]

85-264

85-264

85-264

85-264

85-264

Note3: Minimum order quantity ≥2000pcs

Part

Number

RAC01-05SGA

RAC01-12SGA

On Request
RAC01-3.3SGA

RAC01-15SGA

RAC01-24SGA (3)

Notes:

The RAC01-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 -25°C to +80°C operating temperature range. The RAC01-GA have a built-in Class A / FCC Part 15 EMC filter, are certified to EN60335, EN60950 and EN62368 safety standards and come with a three year warranty.

Output

Voltage

[VDC]

5

12

3.3

15

24

Note2: Max Cap Load is tested at nominal input and full resisitive load

Note1: Measured with all input voltages at 25°C with constant resistant mode at full load



#### RAC01-GA

1 Watt
Single
Output
EMC Class A





Max. Capacitive

Load (2)

[µF]

500

200

500

200

200









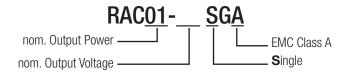








#### **Model Numbering**



**Ordering Examples:** 

RAC01-12SGA 12Vout Single Output EMC Class A

#### PREFERRED ALTERNATIVES

Please consider this alternatives:

RAC02E-K/277

IEC/EN60950-1 certified CAN/CSA-C22.2 No. 62368 certified UL62368-1 certified IEC/EN62368-1 certified EN60335-1 certified EN55032 compliant EN55024 compliant CB Report pending



### Series

#### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS						
Parameter	Condition			Min.	Тур.	Max.
Internal Input Filter						Pi-type
Input Voltage Range (4,5,6)	nom. \	/in= 230VAC		85VAC	230VAC	264VAC
Input Current	115VAC 230VAC				25mA 18mA	30mA 20mA
Inrush Current	cold start at 25°C	115VAC 230VAC				30A 40A
No load Power Consumption						150mW
Input Frequency Range				47Hz		63Hz
Minimum Load				0%		
Power Factor	115VAC, 230VAC			0.4		0.6
Start-up Time	115VAC 230VAC					1s 2s
Hold-up time	115VAC 230VAC					18ms 80ms
Internal Operating Frequency	100% load at nominal Vin				65kHz	
Output Ripple and Noise	COMILE DW	0°C to 80 °C	5Vout 12Vout			100mVp-p 200mVp-p
	20MHz BW	-25 °C to 0 °C	5Vout 12Vout			200mVp-p 300mVp-p

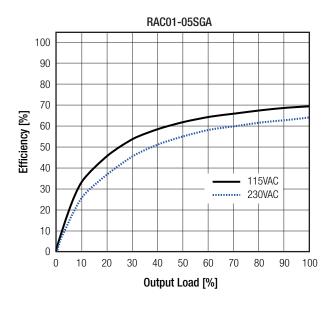
#### Notes:

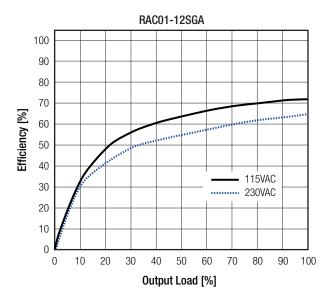
Note4: No proper operation with DC input voltage

Note5: The products were submitted for safety files at AC-Input operation

Note6: Refer to "Line Derating"

#### Efficiency vs. Load





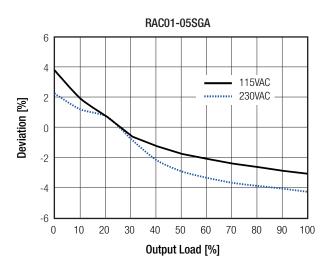


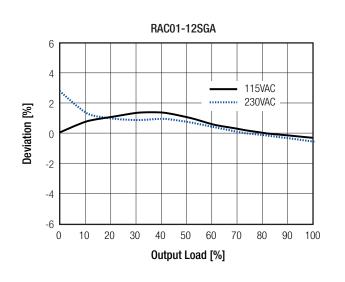
### Series

#### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

REGULATIONS		
Parameter	Condition	Value
Output Accuracy	-25°C to +80°C	±6.0% max.
Line Regulation	-25°C to +80°C	±2.0% max.
Load Regulation	-25°C to +80°C	6.0% max.

#### Deviation vs. Load





PROTECTIONS			
Parameter		Туре	Value
Input Fuse (7)		internal	fusible resistor, 1Ω/1W
Short Circuit Protection (SCP)	be	elow 100mΩ	continuous, auto recovery
Over Voltage Category			OVCII
Over Current Protection (OCP)		5Vout	0.22A - 0.5A, hiccup mode
Over current Protection (OCF)		12Vout	0.25A - 0.91A, hiccup mode
Class of Equipment			Class II
Isolation Voltage (8)	I/P to O/P	rated for 1 minute	3kVAC
Isolation Resistance			100MΩ min.
Insulation Grade			reinforced
Leakage Current		I/P to O/P	0.25mA max.

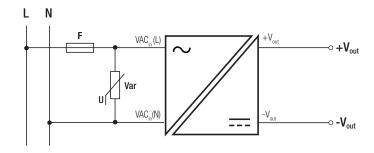
#### Notes:

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

Note8: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note9: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 series

#### **Protection Circuit**





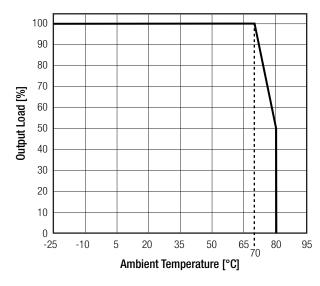
### Series

#### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

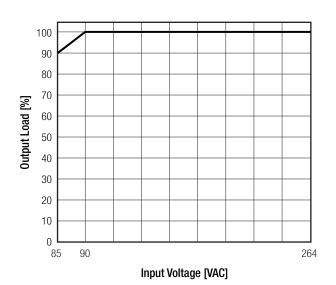
ENVIRONMENTAL				
Parameter	Condition			Value
Operating Temperature Dange	@ natural convection 0.1 m/s	full load		-25°C to +70°C
Operating Temperature Range	@ natural convection 0.1m/s refer to"Derati		ing Graph"	-25°C to +80°C
Maximum Case Temperature				+120°C
Temperature Coefficient				0.03%/K
Operating Altitude (10)				4000m
Operating Humidity	non-co	non-condensing		5% - 90% RH max.
Pollution Degree				PD2
Shock				10-150Hz, 2G 10min./1cycle, period 60min. each along x,y,z axes
Vibration	according to MIL-STD-202G			20G/11ms pulse, 3 times at each x, y, z axes
MTBF (11)	according to MIL-HDBK-217F, method 2	7F mothed 0	+25°C	1691 x 10 <sup>3</sup> hours
		+70°C	424 x 10 <sup>3</sup> hours	

#### **Derating Graph**

(@ Chamber and natural convection 0.1m/s)



#### Line Derating



#### Notes:

Note10: Recognized by UL for safe operation up to 4000m. High altitude operation may impact the performance and lifetime.

Contact TechsupportAT@recom-power.com for advice

Note11: Based on calculation for 5Vout

SAFETY AND CERTIFICATIONS				
Certificate Type (Safety)	Report / File Number	Standard		
Information Technology Equipment, General Requirements for Safety	SA1804152L01001	IEC60950-1:2005 2nd Edition + Am2:2013 EN60950-1:2006 + A12:2011 + A2:2013		
Audio/Video, information and communication technology equipment - Part1: Safety requirements	E196683-A5 and E19668-A6001	UL62368-1, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14		
Audio/Video, information and communication technology equipment - Part1: Safety requirements (CB Scheme)	SA1804152S 001	IEC62368-1:2014 2nd Edition		
Audio/Video, information and communication technology equipment - Part1: Safety requirements	3A10041323 001	EN62368-1:2014+A11:2017		
Household and similar electrical appliances – Safety – Part 1: General requirements	SES180313004001E	EN60335-1:2012+A11:2014		
RoHS2		RoHS 2011/65/EU + AM2015/863		
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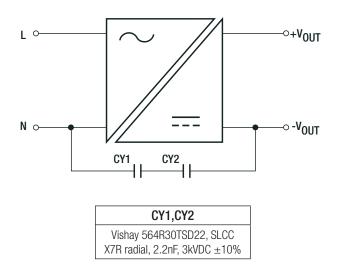


### **Series**

#### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

EMC Compliance	Condition	Standard / Criterion	
Electromagnetic compatibility of multimedia equipment - Emission requirements	EA1804152E 01001	EN55032, Clas	
Information technology equipment - Immunity characteristics - Limits and methods of measurement	EA1604132E 01001	EN55024:2010 + A1:2015	
ESD Electrostatic discharge immunity test	Air ±2, 4, 8kV Contact ±2, 4kV	EN61000-4-2:2009, Criteria A	
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3:2006 + A2:2010, Criteria A	
Fast Transient and Burst Immunity	AC Power Port: ±1.0kV	EN61000-4-4:2012, Criteria A	
Surge Immunity	AC Power Port: L-N ±1.0kV	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	
Power Magnetic Field Immunity	50Hz, 1A/m	EN61000-4-8:2009, Criteria A	
	Voltage Dips >95%	EN61000-4-11:2004, Criteria A	
Voltage Dips and Interruption	Voltage Dips 30%	EN61000-4-11:2004, Criteria B	
	Voltage Interruptions >95%	EN61000-4-11:2004, Criteria B	
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013	

#### EMI Filtering according to EN60335-1 / EN55032 Class B Compliance

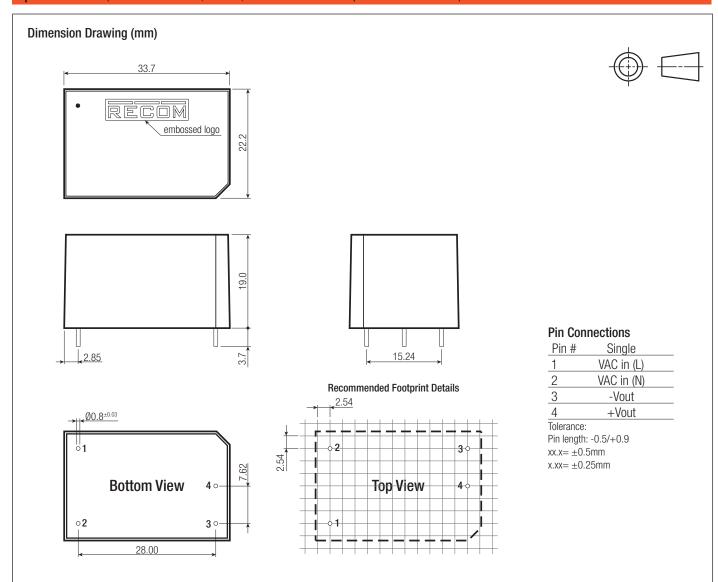


DIMENSION AND PHYSICAL CHARACTERISTICS			
Parameter	Туре	Value	
Material	case PCB	black plastic (UL94V-2) FR4 (UL94V-0)	
Dimension (LxWxH)		33.7 x 22.2 x 19.0mm	
Weight		12g typ.	
continued on next page			



### **Series**

#### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)



PACKAGING INFORMATION			
Parameter	Туре	Value	
Packaging Dimension (LxWxH)	tube	470.0 x 36.4 x 26.4mm	
Packaging Quantity		20pcs	
Storage Temperature Range		-25°C to +85°C	
Storage Humidity	non-condensing	5% - 95% RH max.	

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 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.