

# Features

# Regulated Converter

- Wide input range 85-264VAC
- Standby mode optimized PSU (ENER Lot 6)
- Ultra-high efficiency over entire load range
- Operating temperature range: -40°C to +80°C
- Class II installations (without FG)
- EMC compliant without external components
- No load power consumption < 75mW

# RECOM

## AC/DC Converter

# RAC15-K

## 15 Watt Single Output



IEC62368-1 pending  
 EN62368-1 certified  
 UL62368-1 certified  
 CAN/CSA-C22.2 No. 62368-1-14 certified  
 EN/IEC60335 pending  
 CB Report pending

## Description

The RAC15-K series are highly efficient PCB-mount power conversion modules with ultra-low energy losses especially in light load conditions, making them a benchmark for always-on and standby mode operations, which are typically coming along with IoT and smart applications. The power supply units cover worldwide mains input range of 85VAC up to 264VAC and come with international safety certifications for industrial, AV and ITE as well as household standards. These AC/DC modules operate in a temperature range of -40°C to +80°C and offer fully protected single or dual outputs as well as EMC class B compliance without the need of any external components.

## Selection Guide

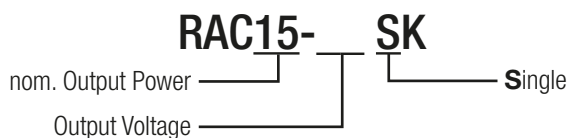
Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ <sup>(1)</sup> [%]	Max. Capacitive Load <sup>(2)</sup> [µF]
RAC15-05SK	85-264	5	3000	84	10000

### Notes:

Note1: Efficiency is tested at 230VAC input and constant resistive load at +25°C ambient

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

## Model Numbering



### Ordering Examples:

RAC15-05SK      5Vout      Single Output      standard THT version

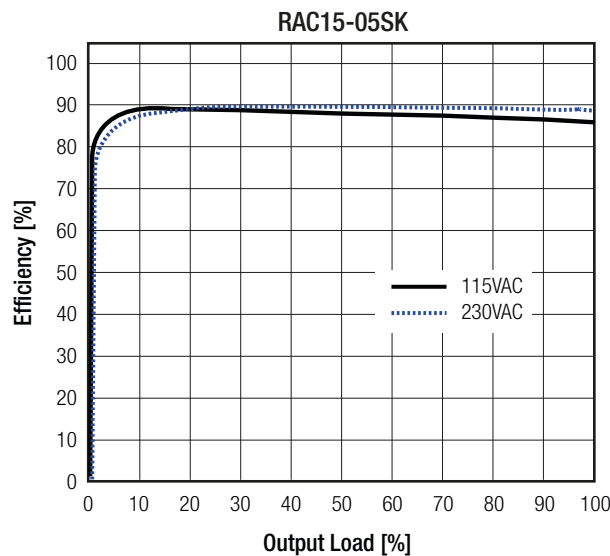
**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter					Pi type
Input Voltage Range <sup>(3,4)</sup>	nom. Vin = 230VAC		85VAC 120VDC	230VAC	264VAC 370VDC
Input Current	115VAC 230VAC				0.40A 0.35A
Inrush Current	cold start at +25°C	115VAC 230VAC			20A 40A
No load Power Consumption	230VAC			40mW	
ErP Lot 6 Standby Mode Conformity (Output Load Capability)	Input Power	0.5W 1.0W 2.0W			0.3W 0.7W 1.6W
Input Frequency Range	AC Input		47Hz		63Hz
Minimum Load			0%		
Power Factor	115VAC 230VAC		0.6 0.5		
Start-up Time				150ms	
Rise Time				40ms	
Hold-up Time	115VAC 230VAC			15ms 90ms	
Internal Operating Frequency					100kHz
Output Ripple and Noise <sup>(5)</sup>	20MHz BW			100mVp-p	

**Notes:**

- Note3: The products were submitted for safety files at AC-Input operation
- Note4: Refer to line derating graph on page 4
- Note5: Measurements are made with a 1.0µF MLCC across output (low ESR)

**Efficiency vs. Load**

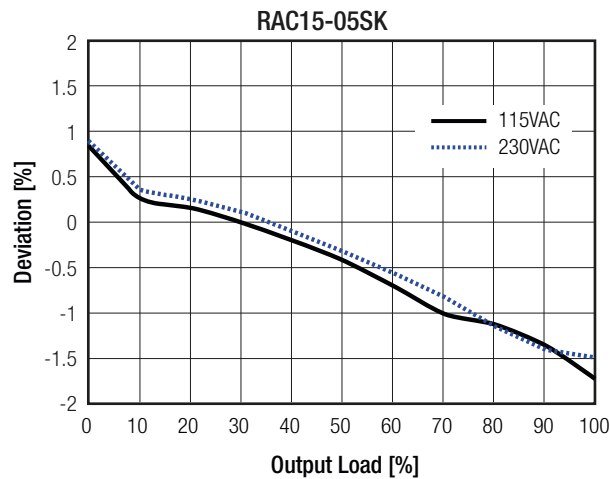


**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

**REGULATIONS**

Parameter	Condition	Value
Output Accuracy		±2.0% typ.
Line Regulation		±1.0% typ.
Load Regulation	10% to 100% load	1.0% typ.
Transient Response	25% load step change recovery time	4.0% max. 500µs typ.

**Deviation vs. Load**



**PROTECTIONS**

Parameter	Type	Value
Input Fuse <sup>(6)</sup>	internal	T3.15A, slow blow type
Short Circuit Protection (SCP)	below 100mΩ	hiccup, auto recovery
Over Voltage Protection (OVP)		150% - 195%, latch off mode
Over Current Protection (OCP)		150% - 195%, latch off mode
Over Voltage Category		OVCII
Class of Equipment		Class II
Isolation Voltage <sup>(7)</sup>	I/P to O/P	tested for 1 minute 4kVAC
Isolation Resistance		Isolation Voltage 500VDC 1GΩ min.
Isolation Capacitance	100kHz/0.1V	100pF max.
Insulation Grade		reinforced
Leakage Current		0.25mA max.

**Notes:**

- Note6: Refer to local wiring regulations if input over-current protection is also required
- Note7: For repeat Hi-Pot testing, reduce the time and/or the test voltage

**ENVIRONMENTAL**

Parameter	Condition	Value
Operating Temperature Range	natural convection 0.1m/s	full load -40°C to +65°C
		refer to derating graph -40°C to +80°C
Maximum Case Temperature	230VAC	+95°C
Temperature Coefficient		0.05%/K
Operating Altitude		3000m
Operating Humidity	non-condensing	20% - 90% RH max.
Pollution Degree		PD2

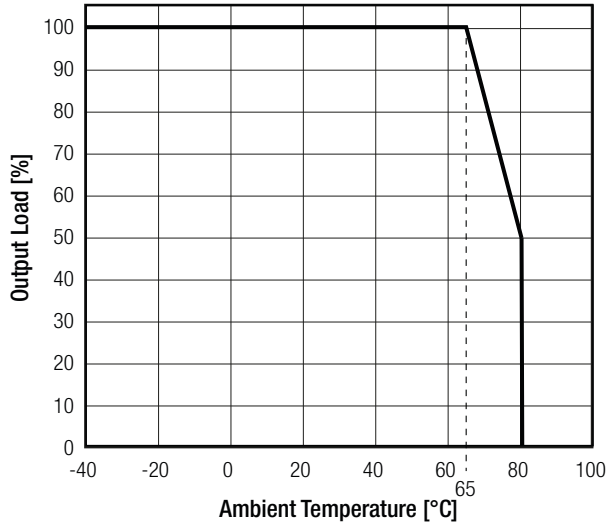
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### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

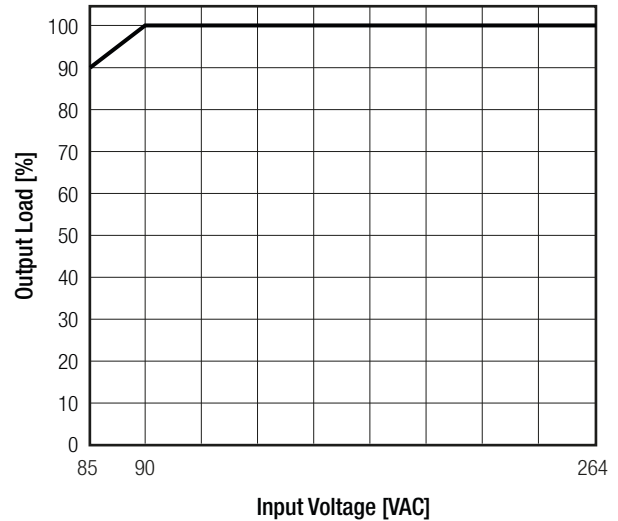
Parameter	Condition	Value
Vibration	according to MIL-STD-202G	10-500Hz, 2G 10min./1cycle, period 60min. along x,y,z axes
Design Lifetime	+25°C	300 x 10 <sup>3</sup> hours
	+55°C	40 x 10 <sup>3</sup> hours
MTBF	according to MIL-HDBK-217F, G.B.	>450 x 10 <sup>3</sup> hours

#### Derating Graph

(@ Chamber and natural convection 0.1m/s)



#### Line Derating



### SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Audio/Video, information and communication technology equipment - Safety requirements	E224736	UL62368-1, 2nd Edition, 2014 CAN/CSA C22.2 Nr. 62368-1-14, 2nd Ed. 2014
Audio/Video, information and communication technology equipment - Safety requirements (CB)	pending	IEC/EN62368-1, 2nd Edition, 2014
Audio/Video, information and communication technology equipment - Safety requirements (LVD)	E491408-A6002-CB-1	EN62368-1, 2nd Edition, 2014 + A11:2017
Household and similar electrical appliances – Safety – Part 1: General requirements	pending	EN/IEC60335-1:2012+A11:2014
RoHS 2		RoHS-2011/65/EU

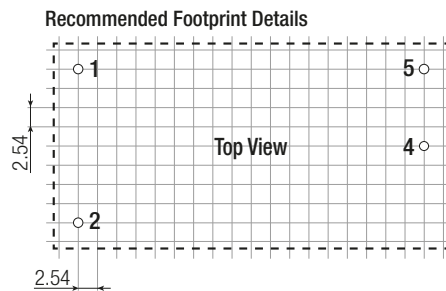
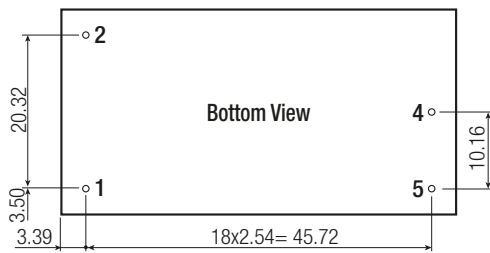
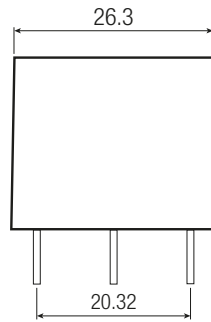
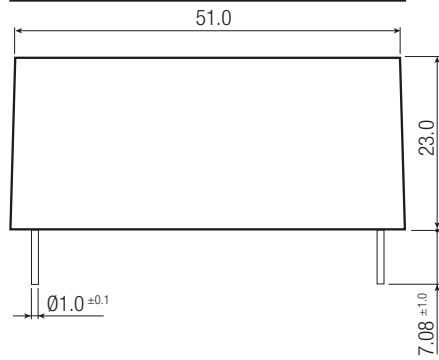
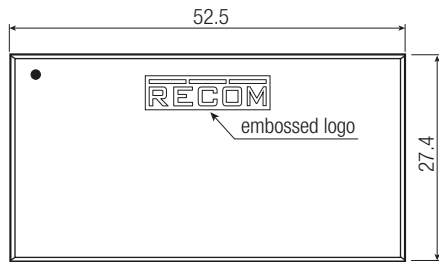
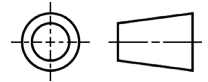
EMC Compliance	Condition	Standard / Criterion
Low voltage power supplies, d.c. output Part 3: Electromagnetic compatibility (EMC)		EN61204-3:2000, Class B
Electromagnetic compatibility of multimedia equipment - Emission requirements		EN55032:2015, Class B
Electromagnetic compatibility of household appliances, electric tools and similar apparatus - Emission Requirements		EN55014-2:2015 + 1:2017
Information technology equipment - Immunity characters - Limits and methods of measurement		EN55024:2010+A1:2015
ESD Electrostatic discharge immunity test	Contact: ±4.0kV	EN61000-4-2:2009, Criteria B
Radiated, radio-frequency, electromagnetic field immunity test		EN61000-4-3:2006 + A2:2010, Criteria B
Fast Transient and Burst Immunity	AC In Port: ±1.0kV	EN61000-4-4, Criteria B
Surge Immunity	AC In 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		EN61000-4-8:2010, Criteria A
Voltage Dips and Interruptions	Voltage Dips 30%	EN61000-4-11:2004, Criteria C
	Voltage Dips 60%	EN61000-4-11:2004, Criteria C
	Voltage Interruptions > 95%	EN61000-4-11:2004, Criteria C
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

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

**DIMENSION AND PHYSICAL CHARACTERISTICS**

Parameter	Type	Value
Material	case	black plastic, (UL94V-0)
	potting	silicone, (UL94V-0)
	PCB	FR4, (UL94V-0)
	baseplate	plastic, (UL94V-0)
Dimension (LxWxH)		52.5 x 27.4 x 23.0mm
Weight		60g typ.

**Dimension Drawing (mm)**



**Pinning information**

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

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

**PACKAGING INFORMATION**

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	490.0 x 56.0 x 40.0mm
Packaging Quantity		15pcs
Storage Temperature Range		-40°C to +85°C
Storage Humidity	non-condensing	20% to 90% RH max.

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