Features

Regulated Converter

- High efficiency over entire load range
- Class II installations (without FG)
- 5W on 1“ x 1“ footprint
- Internal EMC class B filter
- No external components necessary
- Electrical protection

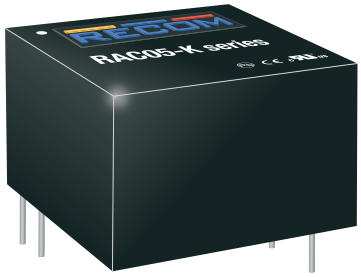
RECOM

AC/DC Converter

RAC05-K

5 Watt 1“ x 1“ Single Output

3 YEAR warranty



Description

The RAC05-K series are ultra-compact AC/DC power supply modules in lightweight fully-encapsulated plastic casing. Beside safety approvals for industrial and IT solutions IEC60950-1 and UL62368-1, the units meet EN55032-“B“ limits without any external components. Integrated fusing as well as electrical protections against short circuit and over voltage are on board. With their excellent efficiency over the entire load range including light load standby conditions, these power modules are especially suitable for IOT applications and control equipment.

Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	Max. Capacitive Load [µF]
RAC05-3.3SK	85-264	3.3	1515	76	6000
RAC05-05SK	85-264	5	1000	80	6000
RAC05-12SK	85-264	12	416	81	1500
RAC05-15SK	85-264	15	333	82	1000
RAC05-24SK	85-264	24	210	84	330

Notes:

Note1: Efficiency is tested at 25°C with constant resistant mode at full load and 230VAC

Model Numbering

RAC05-__SK

Output Voltage — **S**ingle Output

Specifications (measured @ ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

BASIC CHARACTERISTICS					
Parameter	**Condition**		**Min.**	**Typ.**	**Max.**
Internal Input Filter					Pi Type
Input Voltage Range (2)			85VAC 120VDC		264VAC 370VDC
Input Current	115VAC 230VAC				250mA 100mA
Inrush Current	cold start	115VAC 230VAC			15A 30A
No load Power Consumption	264VAC			75mW	
Input Frequency Range			47Hz		63Hz
Minimum Load			0%		
Power Factor	115VAC 230VAC		0.6 0.45		
Start-up Time				20ms	
Rise Time					8ms
Hold-up time	115VAC 230VAC			12ms 60ms	
Internal Operating Frequency					130kHz
Output Ripple and Noise (3)	20MHz BW	3.3Vout, 5Vout others		60mVp-p	 1% of Vout

Notes:

Note2: The products were submitted for safety files at AC-Input operation. Refer to ***„Line Derating“***

Note3: Measurements are made with a 0.1µF MLCC & 10µF E-cap in parallel across output. (low ESR)

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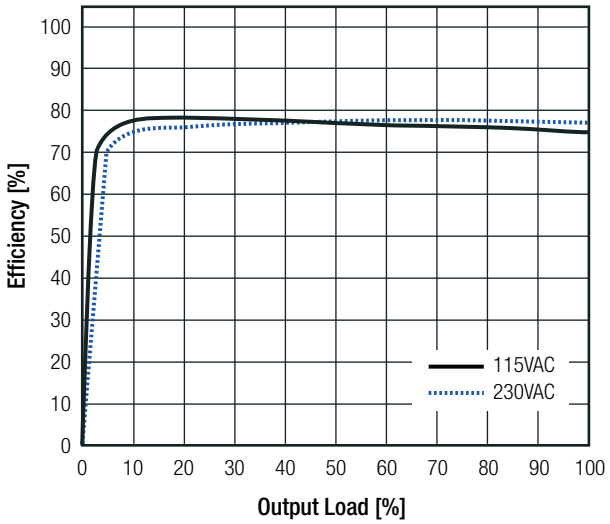
UL62368-1 certified
CSA C22.2 No. 62368-1-14 certified
IEC/EN60950-1 certified
IEC/EN62368-1 certified
EN61204-3 compliant
CB-Report

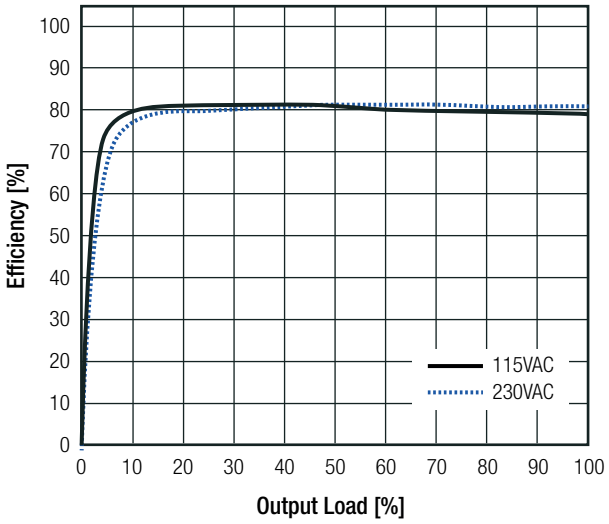
Specifications (measured @ Ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

Efficiency vs. Load

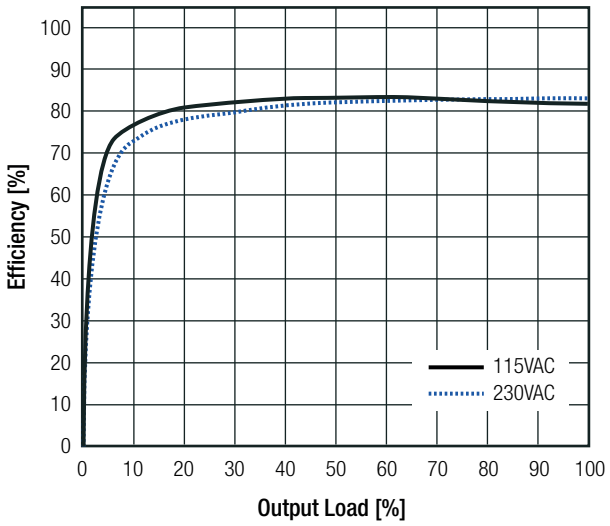
RAC05-3.3SK



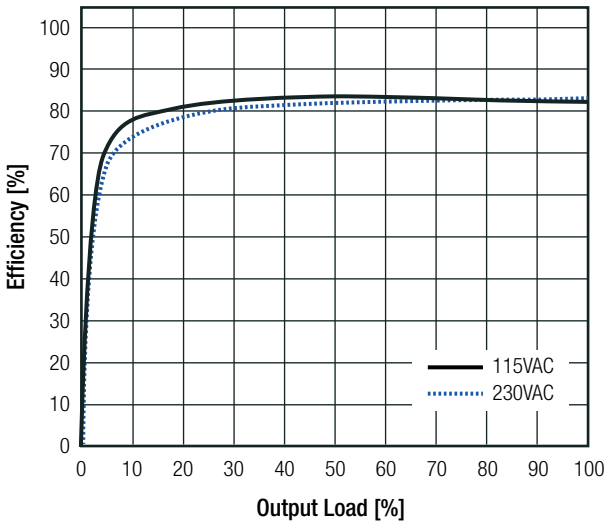
RAC05-05SK



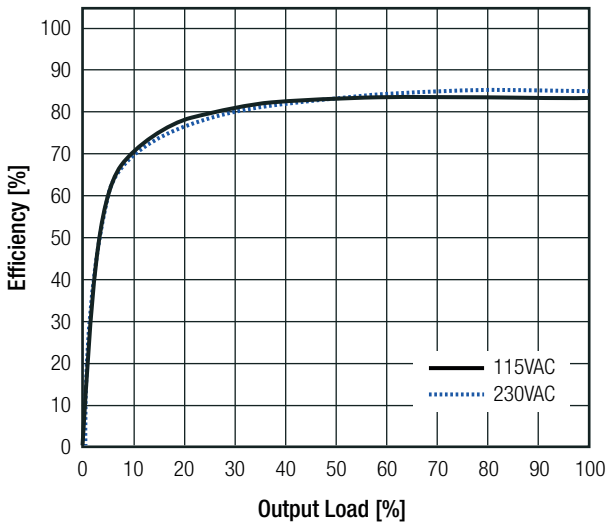
RAC05-12SK



RAC05-15SK



RAC05-24SK



Specifications (measured @ Ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

REGULATIONS		
Parameter	**Condition**	**Value**
Output Accuracy		±1.0% typ.
Line Regulation		±0.5% typ.
Load Regulation		1.0% typ.
Transient Response	25% load step change recovery time	4.0% max. 500µs

PROTECTIONS			
Parameter	**Type**		**Value**
Internal Input Fuse [4]			T1A, slow blow
Short Circuit Protection (SCP)			Hiccup, automatic restart
Over Voltage Protection (OVP)			125% - 195%, latch off mode
Over Current Protection (OCP)			150% - 195%, hiccup mode
Over Voltage Category (OVC)			OVC II
Class of Equipment			Class II
Isolation Voltage	I/P to O/P, I/P to Case and O/P to Case	tested for 1 minute tested for 3 seconds	3kVAC 4kVAC
Isolation Resistance	I/P to O/P	Isolation Voltage 500VDC	1GΩ min.
Isolation Capacitance		100kHz/0.1V	100pF max.
Insulation Grade			reinforced
Leakage Current			0.25mA max.

Notes:

Note4: Refer to local safety regulations if input over-current protection is also required

ENVIRONMENTAL			
Parameter	**Condition**		**Value**
Operating Temperature Range	@ natural convection 0.1m/s	full load	-25°C to +50°C
		refer to ***„Derating Graph“***	-25°C to +70°C
Maximum Case Temperature	230VAC		+90°C
Temperature Coefficient			0.05%/K
Operating Altitude			3000m
Operating Humidity	non-condensing		20% to 90% RH
Design Lifetime	115VAC/60Hz and full load at +25°C		136 x 10^3 hours
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +50°C	>450 x 10^3 hours >250 x 10^3 hours
Pollution Degree			PD2
Vibration			10-500Hz, 2G 10min./1cycle, period 60min. each along x,y,z axes

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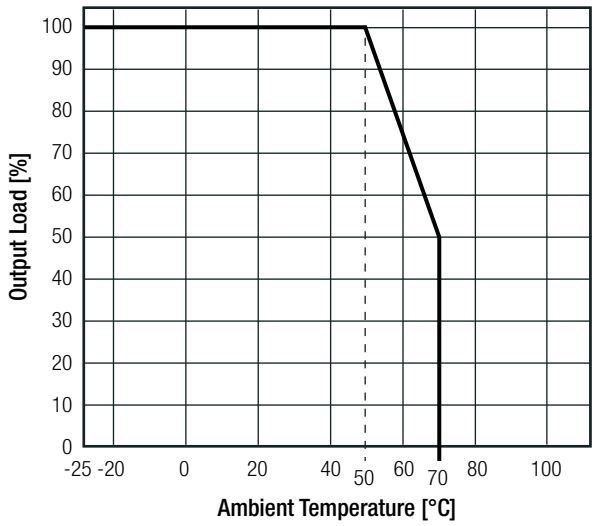
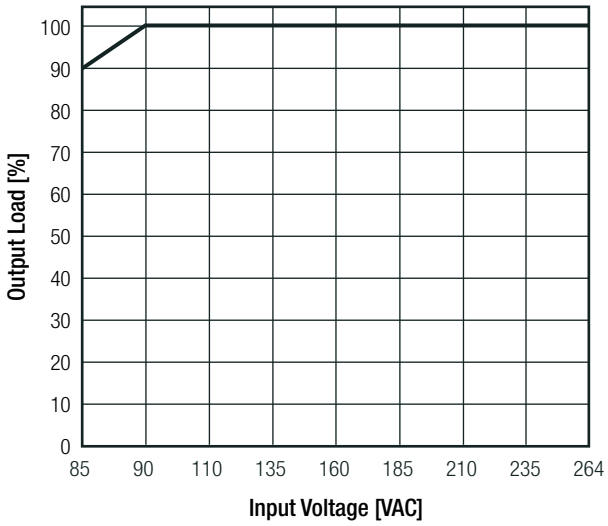
Specifications (measured @ Ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

Derating Graph
(@ Chamber and natural convection 0.1m/s)



Line Derating (5)



Notes:

Note5: No derating required for the specified DC-input range

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 CSA C22.2 Nr. 62368-1-14, 2nd Edition: 2014
Information Technology Equipment, General Requirements for Safety (CB Scheme)	E491408-A2-CB-1	IEC60950-1:2005, 2nd Edition: + A2:2013
Information Technology Equipment, General Requirements for Safety		EN60950-1:2006 + A2:2013
Audio/Video, information and communication technology equipment - Safety requirements (CB Scheme)	OFF-4787889086-1	IEC62368-1:2014, 2nd Edition
Audio/Video, information and communication technology equipment - Safety requirements		EN62368-1: 2014 + A11:2017
EAC	RU-AT.03.67361	TP TC 004/020, 2011
RoHS2+		RoHS 2011/65/EU + AM2015/863

EMC Compliance	Conditions	Standard / Criterion
Low-voltage power supplies DC output - Part 3: Electromagnetic compatibility		EN61204-3: 2000, Class B
ESD Electrostatic discharge immunity test	±8kV Air; ±4kV Contact	EN61000-4-2: 2009, Criteria B
Radiated, radio-frequency, electromagnetic field immunity test	10V/m, 80MHz-1GHz 3V/m, 1.5GHz-2GHz 1V/m, 2GHz-2.7GHz	EN61000-4-3: 2006 + A2, 2010, Criteria A
Fast Transient and Burst Immunity	AC In Port: ±2.0kV	EN61000-4-4: 2012, Criteria B
Surge Immunity	AC In Port (L-N): ±1.0kV DC Output Port: ±0.5kV	EN61000-4-5: 2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC and DC Power Port: 10V	EN61000-4-6: 2014, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	EN61000-4-8: 2010, Criteria A
Voltage Dips and Interruptions	Voltages Dips: >95% Voltage Dips: 30% Interruptions: >95%	EN61000-4-11: 2004, Criteria B EN61000-4-11: 2004, Criteria C EN61000-4-11: 2004, Criteria C
Voltage Fluctuations and Flicker in Public Low-Voltage Systems <=16A per phase		EN61000-3-3: 2013

Notes:

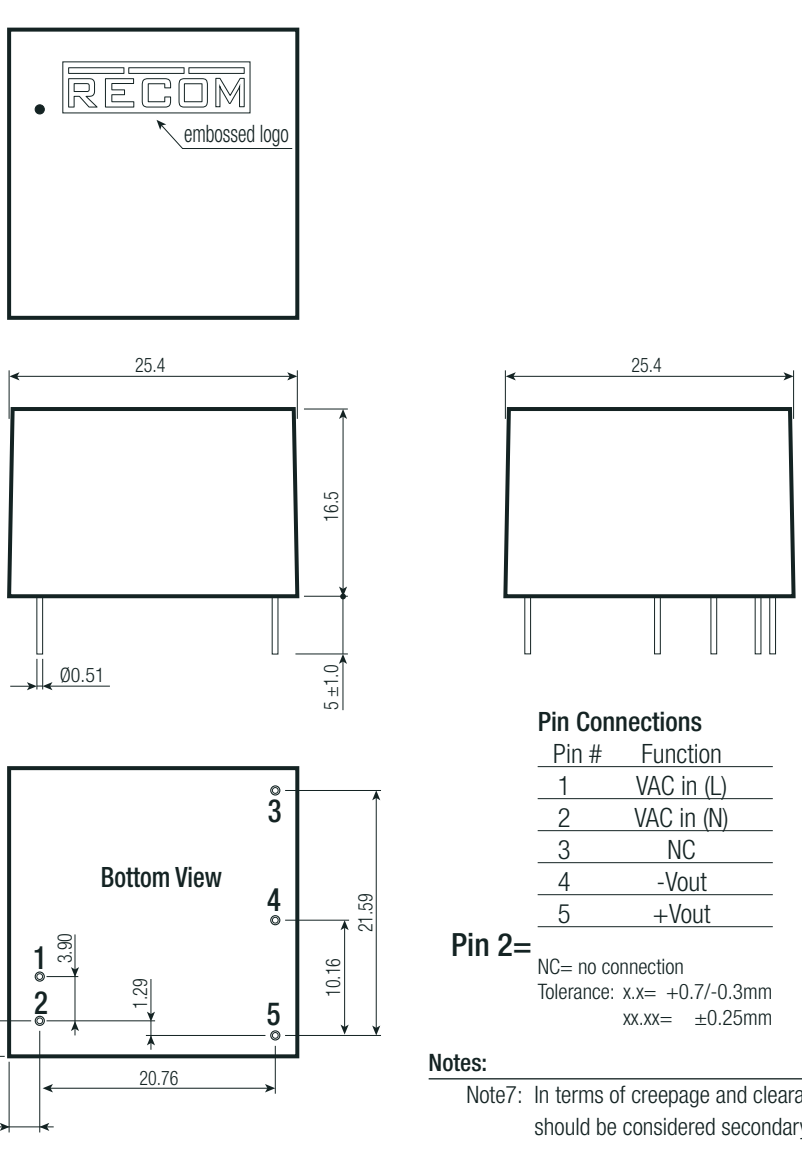
Note6: If output is connected to GND, please contact RECOM tech support for advice

Specifications (measured @ Ta= 25°C, nominal input voltage (115/230VAC), full load and after warm-up)

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB baseplate	black plastic (UL94-V0) silicone (UL94-V0) FR4 (UL94-V0) plastic (UL94-V0)
Dimension (LxWxH)		25.4 x 25.4 x 16.5mm
Weight		20g typ.

Dimension Drawing (mm)



Pin Connections

Pin #	Function
1	VAC in (L)
2	VAC in (N)
3	NC
4	-Vout
5	+Vout

Pin 2=

NC= no connection
Tolerance: x.x= +0.7/-0.3mm
xx.xx= ±0.25mm

Notes:

Note7: In terms of creepage and clearance unconnected pin #3 should be considered secondary side

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	530.0 x 27.5 x 25.6mm
Packaging Quantity		18pcs
Storage Temperature Range		-40°C to +85°C
Storage Humidity	non-condensing	20% to 90% RH