

# Features

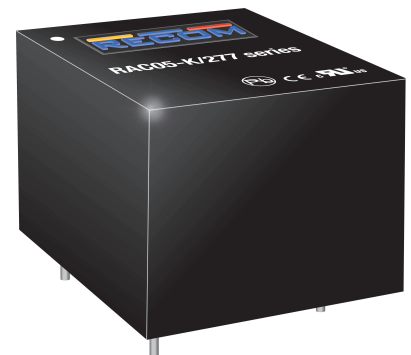
## Regulated Converter

- Wide input range 85-305VAC
- Standby mode optimized (eco design Lot 6)
- High efficiency over the entire load range
- Operating temperature range: -40°C to +85°C
- Overvoltage and overcurrent protected
- EMC compliant without external components
- Encapsulated module with pins or wired

**RECOM**  
AC/DC Converter

## RAC05-K/277

5 Watt  
Single  
Output



UL62368-1 certified  
IEC/EN62368-1 pending  
IEC/EN60335-1 pending  
EN62233 pending  
CB Report

## Description

The RAC05-K/277 series are multipurpose 5 watt AC/DC power supplies for enhanced mains input conditions from 90VAC up to 305VAC with an extra wide operating temperature range from -40°C to +85°C. These modules are designed to supply worldwide applications in automation, Industry 4.0, IoT, household and smart buildings. For worldwide use they come with international safety certifications for industrial, domestic and ITE as well as household standards. With both PCB-mount and wired packages, fully protected outputs, and EMC class B emissions compliance without any external components, these are the easiest to use modular power solutions in the industry.

## Selection Guide

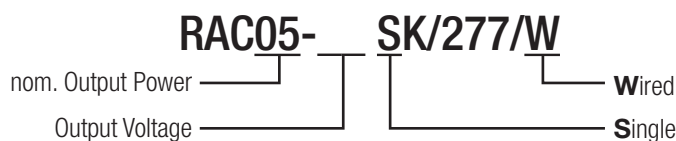
Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ <sup>(1)</sup> [%]	Max. Capacitive Load <sup>(2)</sup> [μF]
RAC05-3.3SK/277	85-305	3.3	1510	77	10000
RAC05-05SK/277	85-305	5	1000	80	8000
RAC05-12SK/277	85-305	12	416	83	1500
RAC05-15SK/277	85-305	15	330	83	1000
RAC05-24SK/277	85-305	24	210	84	330

### 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



### Notes:

Note3: Add suffix „W“ for wired version  
without suffix, standard THT version

### Ordering Examples:

RAC05-05SK/277	5 Watt	5Vout	Single Output	THT version
RAC05-24SK/277	5 Watt	24Vout	Single Output	THT version
RAC05-05SK/277/W	5 Watt	5Vout	Single Output	Wired version
RAC05-12SK/277/W	5 Watt	12Vout	Single Output	Wired version

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

### BASIC CHARACTERISTICS

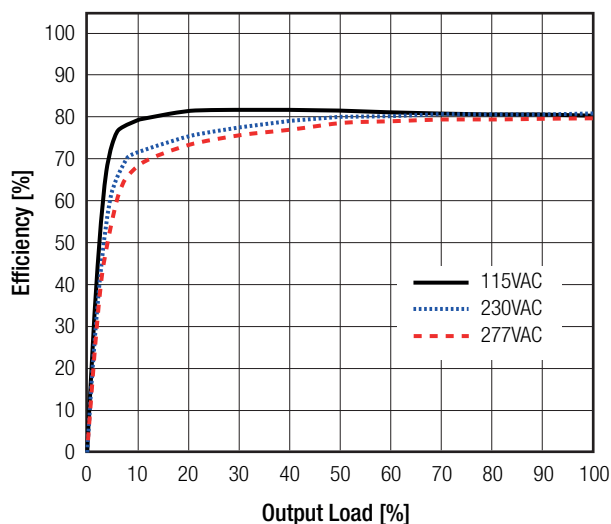
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter			Pi type		
Input Voltage Range <sup>(4,5)</sup>	nom. Vin= 277VAC		85VAC 120VDC	277VAC	305VAC 430VDC
Input Current	115VAC 230VAC 277VAC				150mA 100mA 75mA
Inrush Current	cold start at +25°C	115VAC 230VAC 277VAC			15A 30A 35A
No Load Power Consumption					100mW
Input Frequency Range			47Hz		63Hz
ErP Lot 6 Standby Mode Conformity (Output Load Capability)	Input Power=	0.5W 1.0W			0.34W 0.70W
Minimum Load			0%		
Power Factor	115VAC 230VAC 277VAC		0.60 0.45 0.40		
Start-up Time				20ms	
Rise Time				10ms	
Hold-up Time	115VAC 230VAC 277VAC			20ms 60ms 80ms	
Internal Operating Frequency	100% load at nominal Vin			130kHz	
Output Ripple and Noise <sup>(6)</sup>	20MHz BW	3.3, 5Vout others		60mVp-p 1% of Vout	

#### Notes:

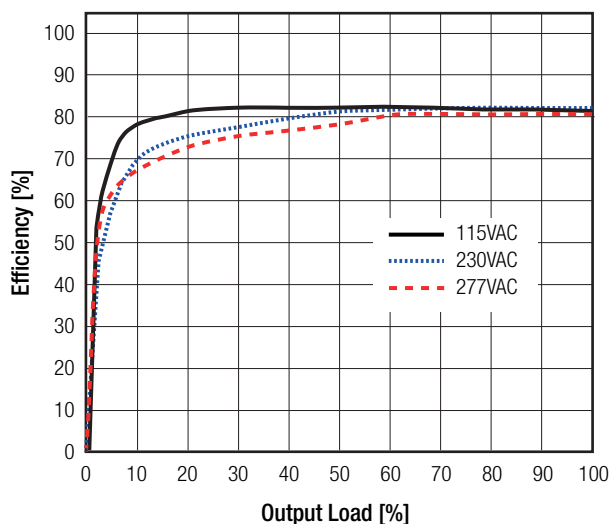
- Note4: The products were submitted for safety files at AC-Input operation  
 Note5: Refer to line derating graph on page 4  
 Note6: Measurements are made with a 1.0μF MLCC across output (low ESR)

### Efficiency vs. Load

RAC05-05SK/277



RAC05-12SK/277



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

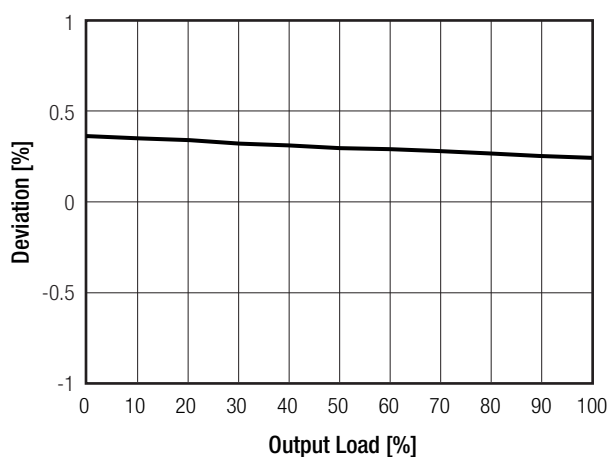
**REGULATIONS**

Parameter	Condition	Value
Output Accuracy		±1.0% max.
Line Regulation	low line to high line, full load	±0.5% typ.
Load Regulation	10% to 100% load	1.0% typ.
Transient Response	25% load step change	4.0% max.
	recovery time	500µs typ.

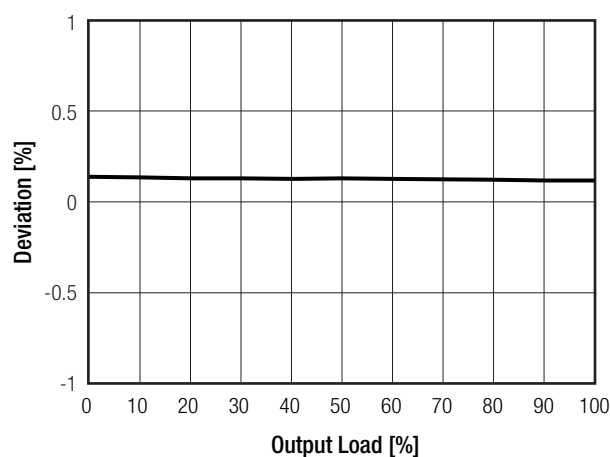
**Deviation vs. Load**

(at 115VAC, 230VAC, 277VAC)

**RAC05-05SK/277**



**RAC05-12SK/277**



**PROTECTIONS**

Parameter	Type		Value
Input Fuse <sup>(7)</sup>	internal		T1A, slow blow
Short Circuit Protection (SCP)	below 100mΩ		hiccup, automatic restart
Over Voltage Protection (OVP)			125% - 195%, hiccup mode
Over Voltage Category			OVCII
Over Current Protection (OCP)			125% - 195%, hiccup mode
Isolation Voltage <sup>(8)</sup>	I/P to O/P	tested for 1 minute	3kVAC
		tested for 10 seconds	4kVAC
Isolation Resistance	Isolation Voltage 500VDC		1GΩ min.
Isolation Capacitance			100pF max.
Insulation Grade			reinforced
Leakage Current			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

**ENVIRONMENTAL**

Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/s	full load	-40°C to +70°C
		refer to derating graph	-40°C to +85°C
Maximum Case Temperature			+95°C

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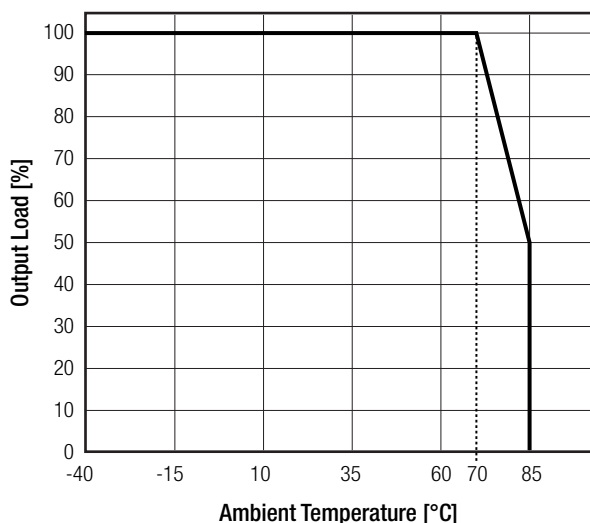
**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

### ENVIRONMENTAL

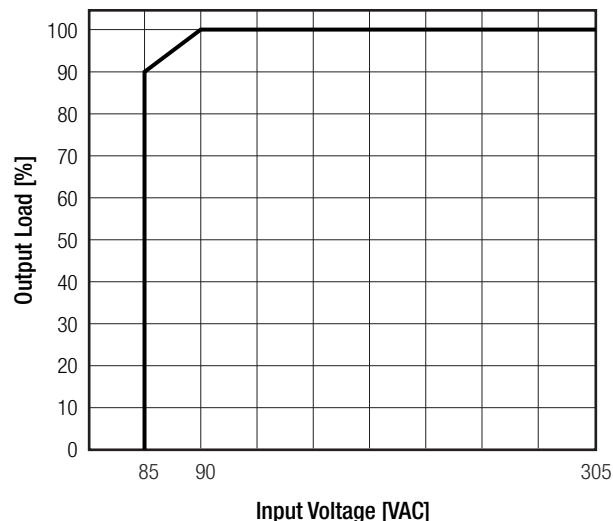
Parameter	Condition		Value
Temperature Coefficient			0.05%/K
Operating Altitude			3000m
Operating Humidity	non-condensing		5% - 95% RH max.
Pollution Degree			PD2
Vibration	according to MIL-STD-202G		10-500Hz, 2G 10min./1cycle, period 60min. each along x,y,z axes
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	>450 x 10 <sup>3</sup> hours
Design Lifetime	230VAC	+25°C	105 x 10 <sup>3</sup> hours
		+70°C	23 x 10 <sup>3</sup> hours
	277VAC	+25°C	105 x 10 <sup>3</sup> hours
		+70°C	18 x 10 <sup>3</sup> hours

### Derating Graph

(@ Chamber and natural convection 0.1m/s)



### Line Derating



### SAFETY AND CERTIFICATIONS

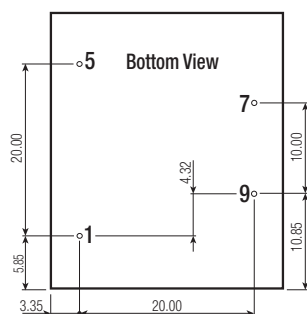
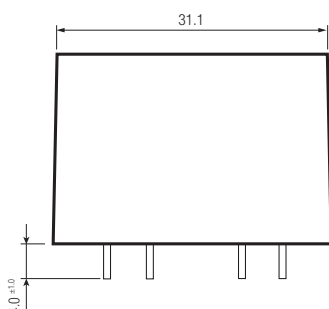
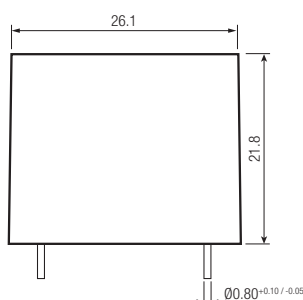
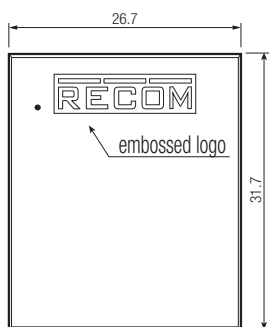
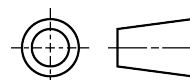
Certificate Type (Safety)	Report / File Number	Standard
Audio/Video, information and communication technology equipment - Part1: Safety requirements	pending	IEC62368-1:2014 2nd Edition EN62368-1:2014 + A11:2017
Audio/Video, information and communication technology equipment - Part1: Safety requirements	pending	UL62368-1, 2nd Edition, 2014-12-01 CAN/CSA-C22.2 No. 62368-1-14, 2nd Edition, 2014-12
Household and similar electrical appliances – Safety – Part 1: General requirements	pending	IEC60335-1:2010 + C1:2016 5th Edition EN60335-1:2012 + A11:2014
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure	pending	EN62233:2008
RoHS 2		RoHS-2011/65/EU + AM-2015/863

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

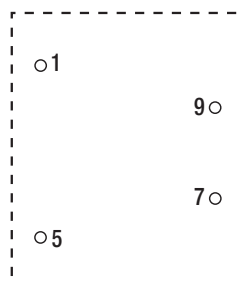
### DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case	plastic, (UL94V-0)
	potting	silicone, (UL94V-0)
	PCB	FR4, (UL94V-0)
	baseplate	plastic, (UL94V-0)
Dimension (LxWxH)	THT/wired	31.7 x 26.7 x 21.8mm
Weight	THT	31.5g typ.
	wired	37.0g typ.

#### Dimension Drawing Single (mm)



#### Recommended Footprint Details



#### Pin Connections

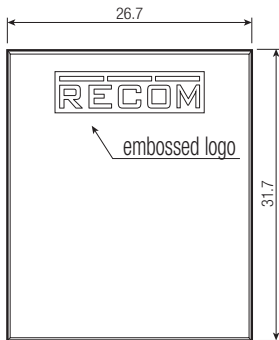
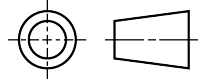
Pin #	Single
1	VAC in (N)
5	VAC in (L)
7	+Vout
9	-Vout

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

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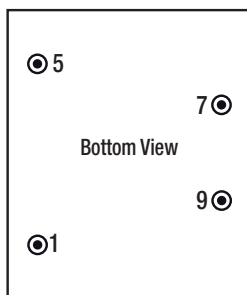
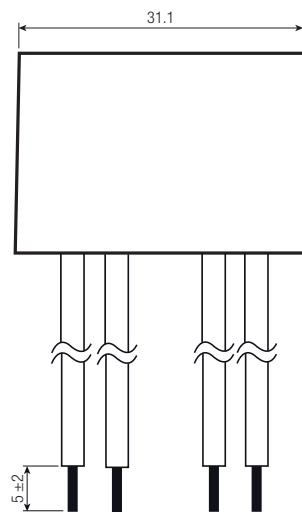
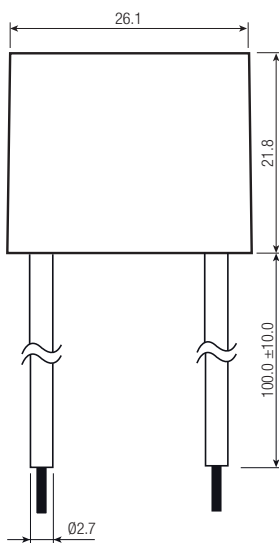
Dimension Drawing Single Wired (mm)



Wired information

#	Function	Wire color	Type	AWG
1	VAC in (N)	blue	UL-1015	18
5	VAC in (L)	brown	UL-1015	18
7	+Vout	red	UL-1015	18
9	-Vout	black	UL-1015	18

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



### PACKAGING INFORMATION

Parameter	Type		Value
Packaging Dimension (LxWxH)	THT wired	tube	466.0 x 29.3 x 30.4mm
		tray	478.0 x 46.0 x 198.0mm
Packaging Quantity	THT wired		12pcs
			20pcs
Storage Temperature Range			-40°C to +85°C
Storage Humidity	non-condensing		20% to 90% RH max.

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