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

RECOM

AC/DC Converter

RAC3.5-K/277

3.5 Watt Single Output

Description

The RAC3.5-K/277 series are multipurpose 3.5 watt AC/DC power supplies for enhanced mains input conditions from 85VAC 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 fully protected outputs, as well as 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 (1) [%]	Max. Capacitive Load (2) [µF]
RAC3.5-3.3SK/277	85-305	3.3	1060	77	10000
RAC3.5-05SK/277	85-305	5	700	80	8000
RAC3.5-12SK/277	85-305	12	291	83	1500
RAC3.5-15SK/277	85-305	15	233	83	1000
RAC3.5-24SK/277	85-305	24	146	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 resisitive load

Model Numbering

RAC3.5- __ SK/277

- nom. Output Power
- Output Voltage
- Single

Ordering Examples:

RAC3.5-05SK/277	3.5 Watt	5Vout	Single Output
RAC3.5-24SK/277	3.5 Watt	24Vout	Single Output

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

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 (3,4)	nom. Vin= 277VAC		85VAC 120VDC	277VAC	305VAC 430VDC
Input Current	115VAC 230VAC 277VAC			110mA 80mA 60mA	
Inrush Current	cold start at +25°C	115VAC 230VAC 277VAC			15A 30A 35A
No Load Power Consumption					100mW
ErP Lot 6 Standby Mode Confirmity (Output Load Capability)	Input Power=	0.5W			0.34W
		1.0W			0.70W
Input Frequency Range			47Hz		63Hz
Minimum Load			0%		
Power Factor	115VAC 230VAC 277VAC		0.50 0.40 0.35		
Start-up Time				20ms	
Rise Time				10ms	
Hold-up Time	115VAC 230VAC 277VAC			20ms 25ms 90ms	
Internal Operating Frequency				130kHz	
Output Ripple and Noise (5)	20MHz BW	3.3, 5Vout others		60mVp-p 1% of Vout	

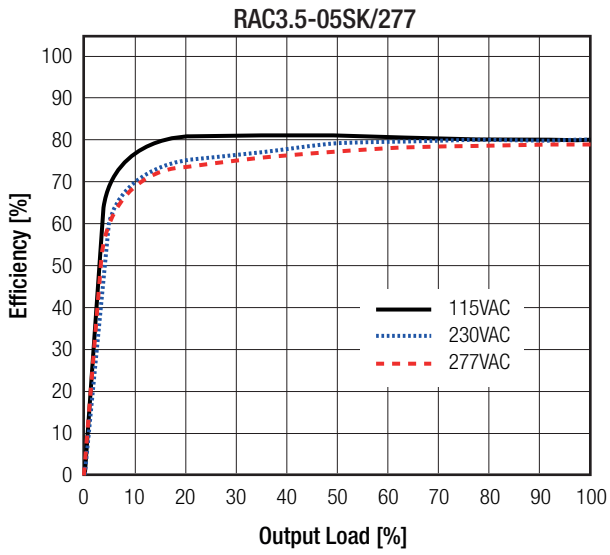
Notes:

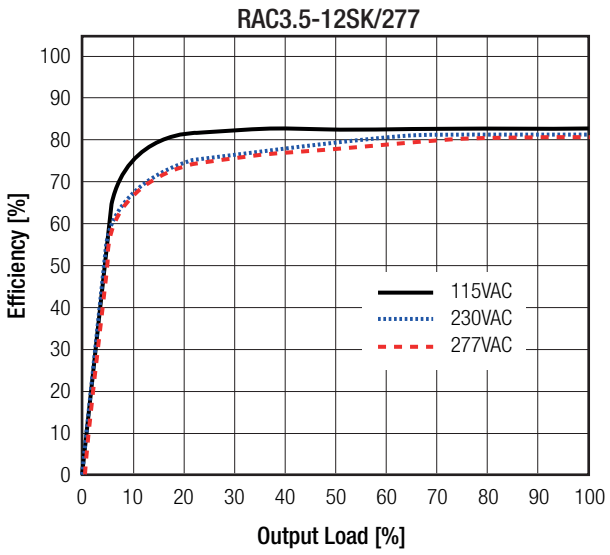
Note3: The products were submitted for safety files at AC-Input operation

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





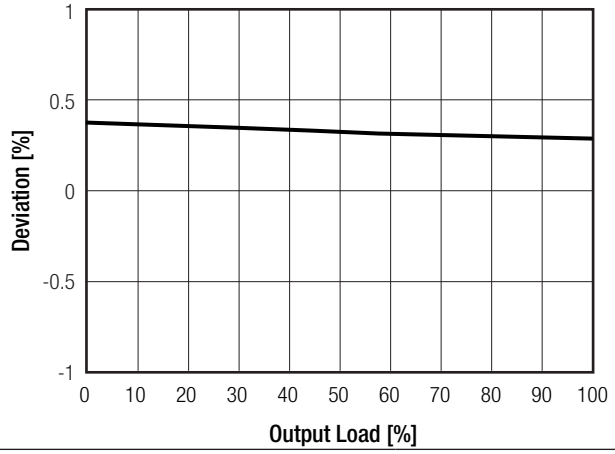
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

REGULATIONS

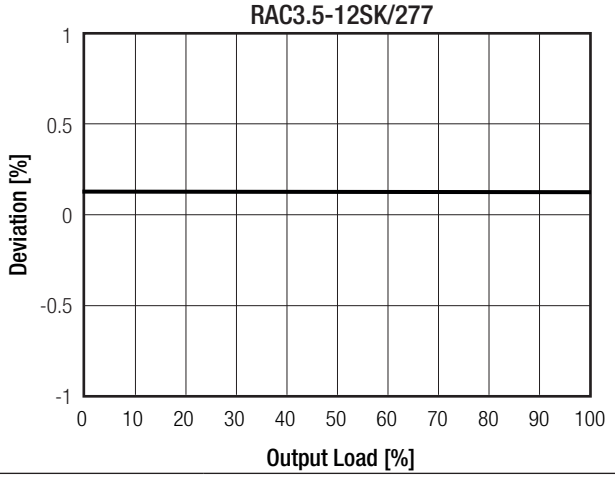
Parameter	Condition	Value
Output Accuracy		±1.0% max.
Line Regulation	low line to high line, full load	±0.5% typ.
Load Regulation	10% to 100% load	1.0% typ.
Transient Response	25% load step change	4.0% max.
	recovery time	500µs typ.

Deviation vs. Load
(at 115VAC, 230VAC, 277VAC)

RAC3.5-05SK/277



RAC3.5-12SK/277



PROTECTIONS

Parameter	Type		Value
Input Fuse (6)	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)			175% - 275%, hiccup mode
Isolation Voltage (7)	I/P to O/P	tested for 1 minute	3kVAC
	I/P to O/P	tested for 10 seconds	4kVAC
Isolation Resistance	I/P to O/P	Isolation Voltage 500VDC	1GΩ min.
Isolation Capacitance			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 +70°C
		refer to derating graph	-40°C to +85°C
Maximum Case Temperature			+95°C
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 AXIS

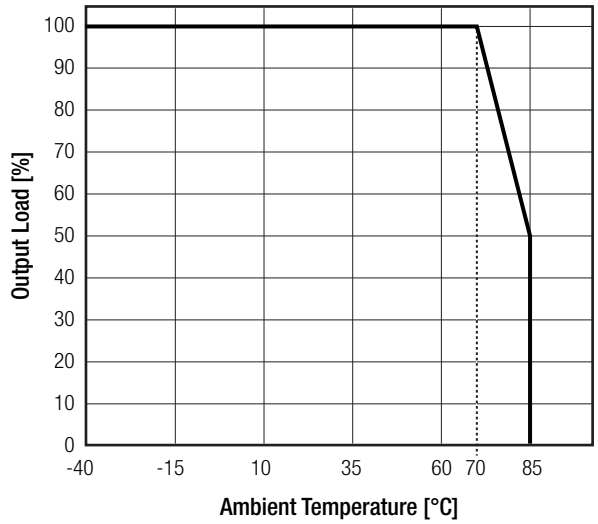
continued on next page

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

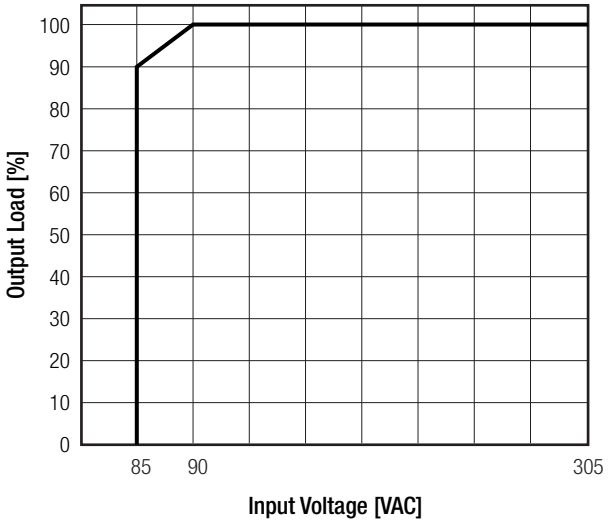
ENVIRONMENTAL

Parameter	Condition		Value
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	>600 x 10^3 hours
Design Lifetime	230VAC	+25°C	125 x 10^3 hours
		+70°C	34 x 10^3 hours
	277VAC	+25°C	105 x 10^3 hours
		+70°C	27 x 10^3 hours

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



Line Derating



SAFETY AND CERTIFICATIONS

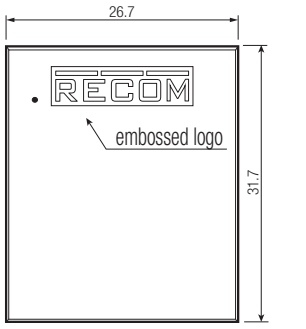
Certificate Type (Safety)	Report / File Number	Standard
Audio/Video, information and communication technology equipment - Part1: Safety requirements	pending	IEC62368-1:2014 2nd Edition EN62368-1:2014 + A11:2017
Audio/Video, information and communication technology equipment - Part1: Safety requirements	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 + C1:2010 + 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

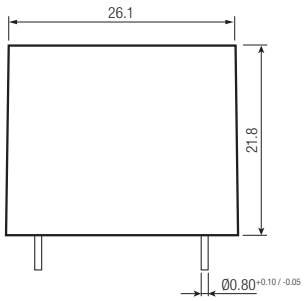
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

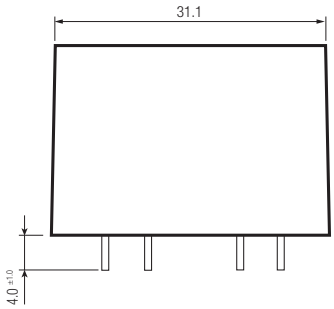
DIMENSION AND PHYSICAL CHARACTERISTICS

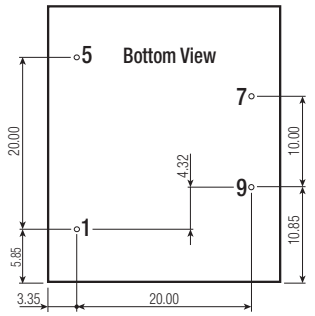
Parameter	Type	Value
Material	case potting PCB baseplate	black plastic, (UL94V-0) silicone, (UL94V-0) FR4, (UL94V-0) plastic, (UL94V-0)
Dimension (LxWxH)		31.7 x 26.7 x 21.8mm
Weight		31.5g typ.

Dimension Drawing (mm)

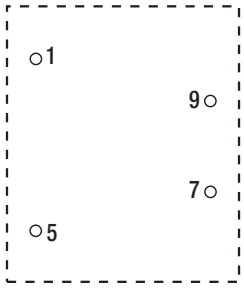








Recommended Footprint Details



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

PACKAGING INFORMATION

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