

# Features

# Regulated Converters

- 0.25W max. No Load Power Consumption
- Efficiency up to 83%
- Isolated Output 3kVAC / 1 min
- SCP, OVP, OCP(OLP) Protection
- Wide Operating Temperature Range: -40°C to +70°C with derating
- Universal Input 90-264VAC



## RAC20-N

20 Watt  
Single  
Output



### Description

The RAC20-N series is a universal-input, board-mounting AC/DC module that delivers 20W in a compact 2" x 1" footprint. The converter is pin-compatible with the RAC05-SC, RAC10-SC and RAC20-SB models, offering a simple power upgrade or a cost-down option without requiring any PCB changes.

### Selection Guide

Part Number	nom. Input Voltage [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. [%]	Max. Capacitive Load [μF]	Output Power max. [W]
RAC20-3.3SN	115/230	3.3	3600	73	5000	12
RAC20-05SN	115/230	5	3600	78	5000	18
RAC20-12SN	115/230	12	1660	82	1500	20
RAC20-15SN	115/230	15	1330	83	1000	20
RAC20-24SN	115/230	24	833	83	470	20



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

BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range		90VAC 120VDC	230VAC	264VAC 370VDC
Input Current	115VAC 230VAC			385mA 250mA
Inrush Current	115VAC 230VAC			20A 40A
No load Power Consumption				0.25W
Input Frequency Range		47Hz		440Hz
Hold-up time	115VAC 230VAC		10ms 50ms	
Minimum Load			0%	
Output Ripple and Noise <sup>(1)</sup>	20MHz BW			120mVp-p
<b>Notes:</b>				
Note1: Measurement made with a 100nF and 47μF capacitor across output.				



UL60950-1 Certified  
CSA C22.2 No. 60950-1-07 Certified  
IEC/EN60950-1 Certified  
EN55022 Compliant  
EN55024 Compliant

### REGULATIONS

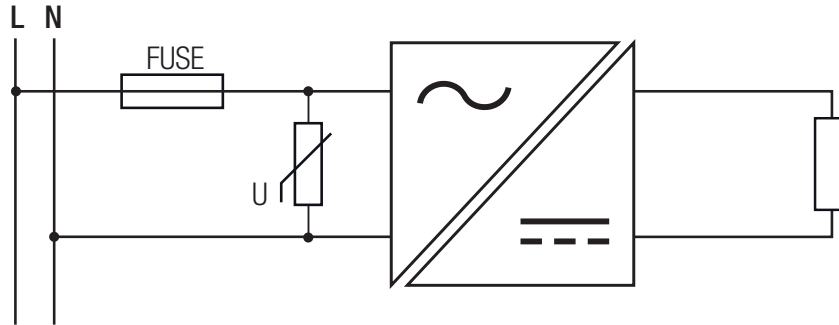
Parameter	Condition	Value
Output Voltage Accuracy		±2% typ.
Line Voltage Regulation	low line to high line	±0.5% typ.
Load Voltage Regulation	5% to 100% load	±1% typ.

Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

### PROTECTIONS

Parameter	Type	Value
Short Circuit Protection (SCP)	Hiccup mode	auto recovery
Over Voltage Protection (OVP)	Zener Diode Clamp	110% - 140%
Over Power Protection (OPP)	Hiccup mode	auto recovery
Isolation Voltage	I/P to O/P	3kVAC / 1 Minute

#### Protection Circuit



#### Notes:

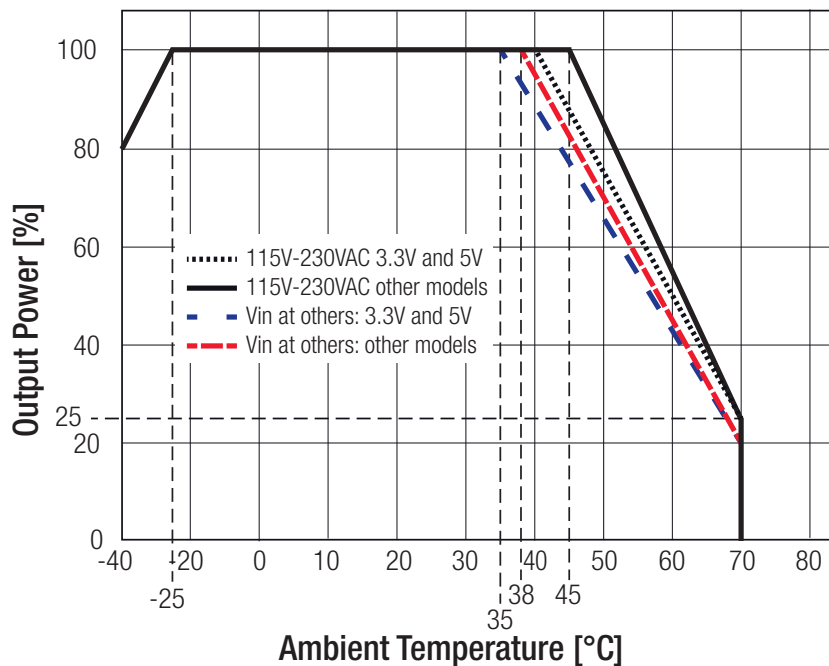
Note2: An external input fuse is recommended: T2A slow blow type.

Note3: An external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g.14S471K

### ENVIRONMENTAL

Parameter	Condition	Value
Operating Temperature Range	with derating (see graph)	-40°C to +70°C
Maximum Case Temperature		+80°C
Temperature Coefficient		$\pm 0.05\%/^\circ\text{C}$
Humidity	non-condensing	95%, RH max.
MTBF	MIL-HDBK-217F, +25°C	400 x 10 <sup>3</sup> hours

#### Derating Graph

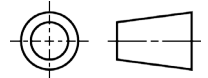
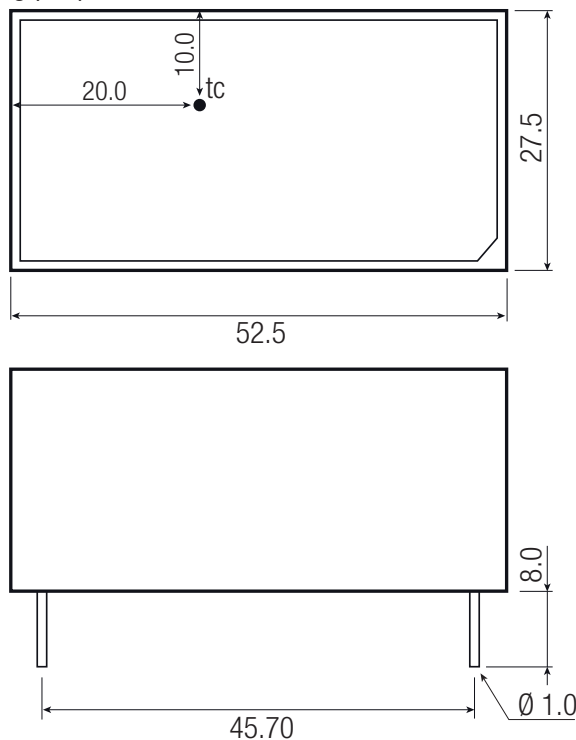


Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment - General Requirements for Safety	LVD1605075	IEC/EN60950-1, 2nd Edition, 2013
	E196683	UL60950-1 CSA C22.2 No. 60950-1-07
EMC Compliance	Condition	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement		EN55022, 2011 Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024, 2010
Limits for harmonic current emissions		IEC61000-3-2, 2014
Limitation of voltage fluctuations/flicker in low-voltage systems		IEC61000-3-3, 2013
ESD Electrostatic discharge immunity test	$\pm 8\text{kV}$ Air Discharge, $\pm 4\text{kV}$ Contact Discharge	IEC61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3, Criteria A
Fast Transient and Burst Immunity	$\pm 1\text{kV}$	IEC61000-4-4, Criteria A
Surge Immunity	$\pm 2\text{kV}$	IEC61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	3V	IEC61000-4-6, Criteria A
Power Magnetic Field Immunity	1A/m	IEC61000-4-8, Criteria A
Voltage Dips and Interruptions	>95%	IEC61000-4-11, Criteria B
	30%	IEC61000-4-11, Criteria A

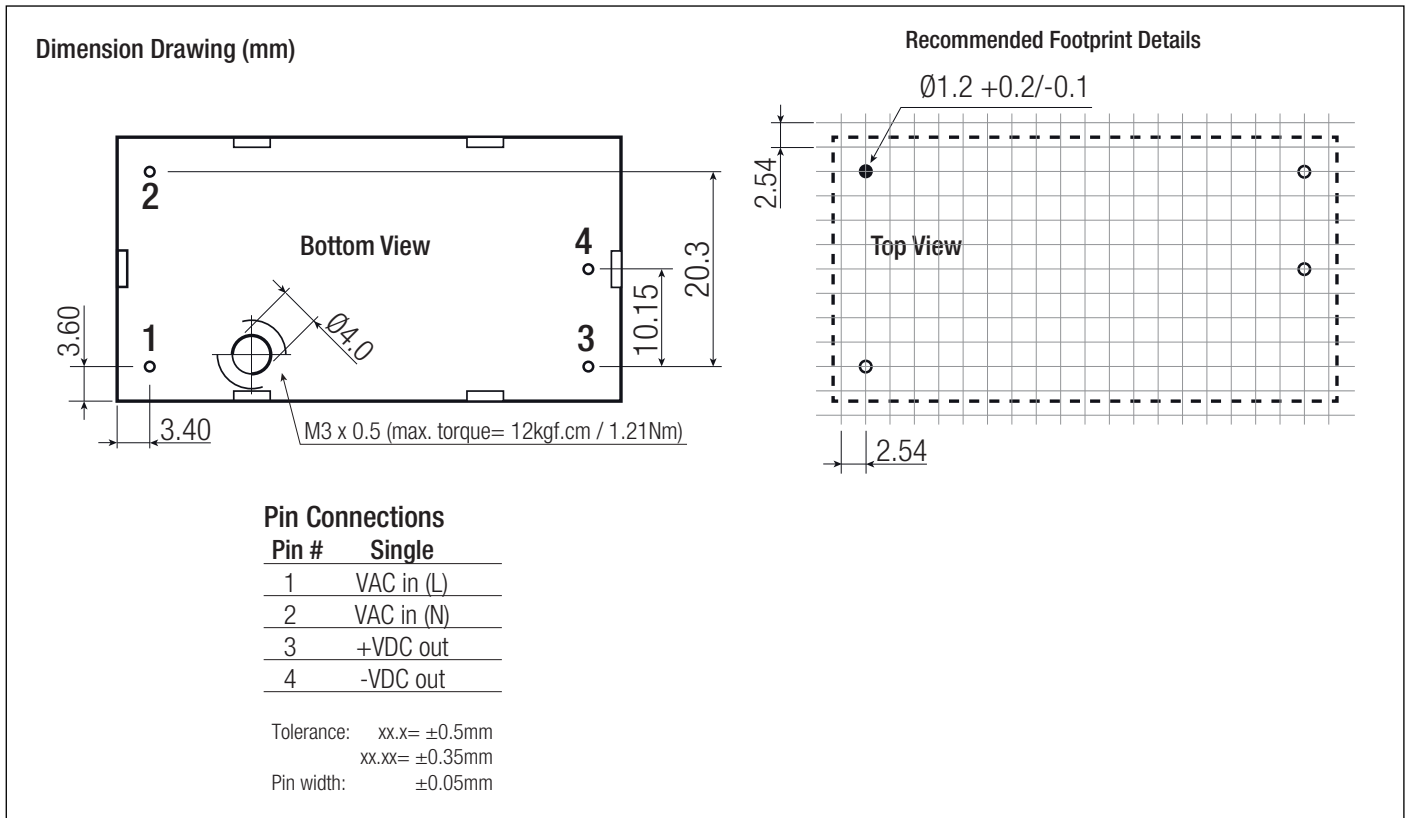
DIMENSION and PHYSICAL CHARACTERISTICS			
Parameter	Type		Value
Material	Case		plastic resin (UL94V-0)
	Potting		silicone (UL94V-0)
Package Dimension (LxWxH)			52.5 x 27.5 x 23.5mm
Package Weight			62g typ.

Dimension Drawing (mm)



continued on next page

Specifications (measured @  $t_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)



### PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	260.0 x 70.0 x 42.0mm
Packaging Quantity		8 pcs
Storage Temperature Range		-40°C to +85°C