

**!NOT RECOMMENDED FOR NEW DESIGNS!**  
LAST TIME BUY: 30<sup>th</sup> OCT 2020, 3.3VOUT VERSION ONLY

**RECOM**  
AC/DC Converter

## Features

- 0.25W maximum no load power consumption
- Efficiency up to 83%
- Isolated output 3kVAC / 1 minute
- SCP, OVP, OCP(OLP) protection
- Wide operating temperature range  
-40°C to +70°C with derating
- Universal input 90-264VAC

## Regulated Converter

## 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	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	Max. Capacitive Load [µF]	Output Power max. [W]
RAC20-05SN	90-264	5	3600	78	5000	18
RAC20-12SN	90-264	12	1660	82	1500	20
RAC20-15SN	90-264	15	1330	83	1000	20
RAC20-24SN	90-264	24	833	83	470	20

### Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

## NRND (Last time buy: 30<sup>th</sup> Oct 2020)

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	Max. Capacitive Load [µF]	Output Power max. [W]
RAC20-3.3SN	90-264	3.3	3600	73	5000	12

## Model Numbering



### Ordering Examples:

RAC20-05SN	20 Watt	5Vout	Single Output
RAC20-24SN	20 Watt	24Vout	Single Output

**PREFERRED ALTERNATIVES**  
Please consider these alternatives:

**RAC20-K Series**

UL60950-1 certified  
CSA G22.2 No. 60950-1-07 certified  
IEC/EN60950-1 certified  
EN55032 compliant  
EN55024 compliant

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

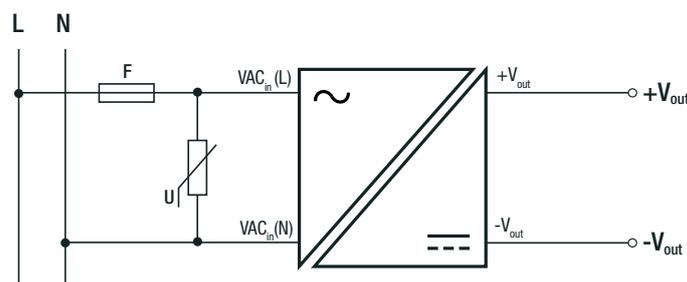
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range <sup>(2)</sup>			90VAC 120VDC	230VAC	264VAC 370VDC
Input Current	115VAC 230VAC				385mA 250mA
Inrush Current	2ms max., cold start	115VAC 230VAC			20A 40A
No load Power Consumption	115VAC/230VAC				0.25W
Input Frequency Range	AC Input		47Hz		440Hz
Minimum Load			0%		
Hold-up Time	115VAC 230VAC			10ms 50ms	
Output Ripple and Noise <sup>(3)</sup>	20MHz BW				120mVp-p
<b>Notes:</b>					
Note2: The products were submitted for safety files at AC-Input operation					
Note3: Measurements are made with a 0.1µF and 47µF MLCC in parallel across output (low ESR)					

REGULATIONS		
Parameter	Condition	Value
Output Accuracy		±2.0% typ.
Line Regulation	low line to high line, full load	±0.5% typ.
Load Regulation <sup>(4)</sup>	5% to 100% load	1.0% typ.
<b>Notes:</b>		
Note4: Operation below 5% load will not harm the converter, but specifications may not be met		

PROTECTIONS		
Parameter	Type	Value
Short Circuit Protection (SCP)		Hiccup mode, auto recovery
Over Voltage Protection (OVP)		110% - 140%, zener diode clamp
Over Current Protection (OLP)		Hiccup mode, auto recovery
Isolation Voltage	I/P to O/P	tested for 1 minute 3kVAC

- Notes:**
- Note5: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type
  - Note6: An external MOV is recommended. The varistor should comply with IEC-61051-2. e.g. 14S471K series

**Protection Circuit**

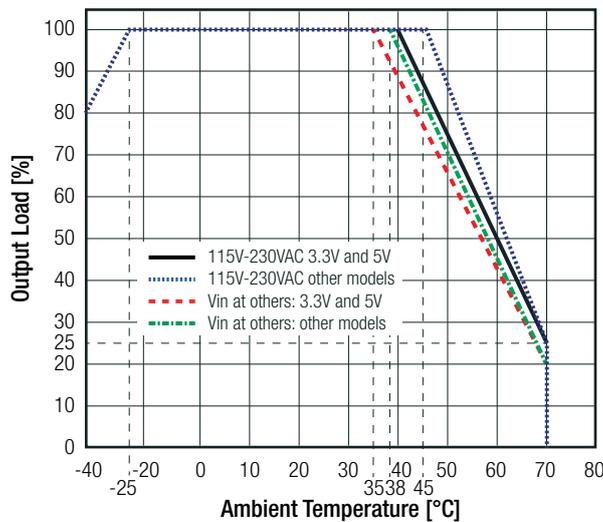


**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

ENVIRONMENTAL			
Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/s	full load	-25°C to +35°C
		refer to derating graph	-40°C to +70°C
Maximum Case Temperature			+80°C
Temperature Coefficient			±0.05%/K
Operating Humidity	non-condensing		95% RH max.
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	400 x 10 <sup>3</sup> hours

**Derating Graph**

(@ Chamber and natural convection 0.1m/s)



**SAFETY AND CERTIFICATIONS**

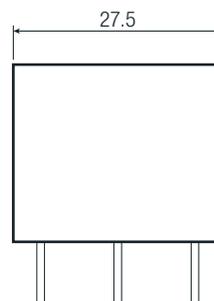
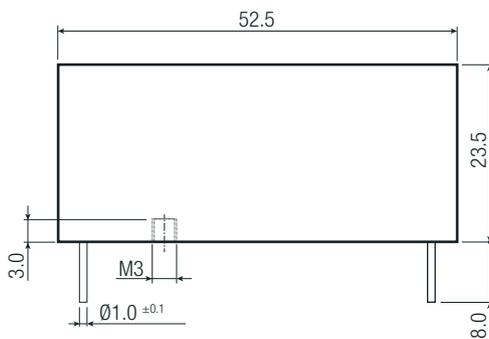
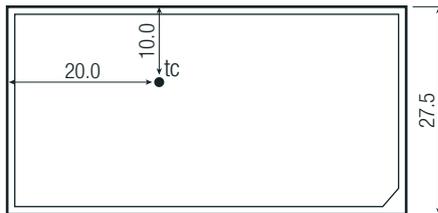
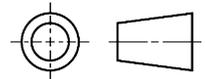
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 2nd Edition, 2007 CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2007
Information Technology Equipment, General Requirements for Safety (LVD)	SPCLVD1605075	EN60950-1:2006 + A2:2013 IEC60950-1:2005 2nd Edition + A2:2013
EAC Safety of Low Voltage Equipment	RU-AT.49.09571	TP TC 004/2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55032:2015, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
Limits for harmonic current emissions		EN61000-3-2, 2014
Limitation of voltage fluctuations/flicker in low-voltage systems		EN61000-3-3, 2013
ESD Electrostatic discharge immunity test	±8.0kV Air, ±4.0kV Contact	IEC61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1.0kV	IEC61000-4-4, Criteria A
Surge Immunity	AC Power Port: ±1.0kV DC Output: L-PE + N-PE ±2.0kV	IEC61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V	IEC61000-4-6, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	IEC61000-4-8, Criteria A
Voltage Dips and Interruptions	Voltage Dips >95%	IEC61000-4-11:2004, Criteria A
	Voltage Dips 30%	IEC61000-4-11:2004, Criteria A
	Voltage Interruptions >95%	IEC61000-4-11:2004, Criteria C

**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	plastic resin (UL94V-0) silicone (UL94V-0)
Dimension (LxWxH)		52.5 x 27.5 x 23.5mm
Weight		62g typ.

**Dimension Drawing (mm)**



**Pinning information**

Pin #	Single
1	VAC in (L)
2	VAC in (N)
3	+VDC out
4	-VDC out

recommended tightening torque= 1.21Nm max.

tc= case temperature measuring point

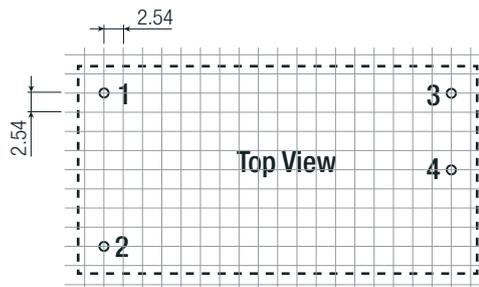
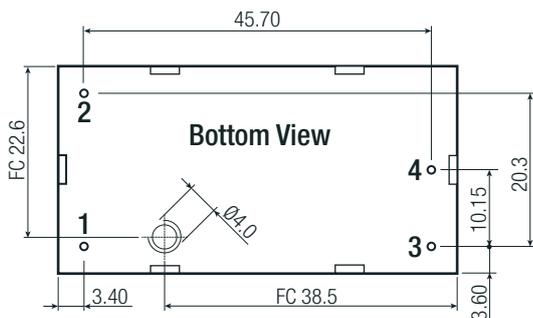
FC= fixing centers

Tolerance: xx.x= ±0.5mm

xx.xx= ±0.35mm

Pin width: ±0.05mm

**Recommended Footprint Details**



PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	260.0 x 70.0 x 42.0mm
Packaging Quantity		8pcs
Storage Temperature Range		-40°C to +85°C
Storage Humidity	non-condensing	95% RH max.

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