NOT RECOMMENDED FOR NEW DESIGNS

Features

Regulated Converter

- 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

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. ⁽¹⁾ [%] | Max. Capacitive Load [µF] | Output Power max. [W] |
| RAC20-3.3SN | 90-264 | 3.3 | 3600 | 73 | 5000 | 12 |
| 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

Model Numbering



Ordering Examples:

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



RAC20-N

20 Watt Single Output













PREFERRED ALTERNATIVESPlease consider these alternatives:

RAC20-K Series

UL60950-1 certified CSA C22.2 No. 60950-1-07 certified IEC/EN60950-1 certified EN55032 compliant EN55024 compliant

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RAC20-N

Series

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

| BASIC CHARACTERISTICS | | | | | |
|-----------------------------|----------------------|------------------|-----------------|--------------|------------------|
| Parameter | Conditi | Condition | | Тур. | Max. |
| Input Voltage Range (2) | | | 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/23 | 115VAC/230VAC | | | 0.25W |
| Input Frequency Range | AC Inpu | AC Input | | | 440Hz |
| Minimum Load | | | | | |
| Hold-up Time | | 115VAC 230VAC | | 10ms 50ms | |
| Output Ripple and Noise (3) | 20MHz E | 20MHz BW | | | 120mVp-p |

Notes:

Note2: The products were submitted for safety files at AC-Input operation

Note3: Measurements are made with a $0.1\mu F$ and $47\mu F$ MLCC in parallel across output (low ESR)

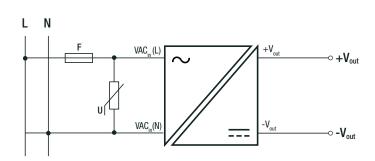
| REGULATIONS | | |
|-------------------------|---|------------|
| Parameter | Condition | Value |
| Output Accuracy | | ±2.0% typ. |
| Line Regulation | low line to high line, full load | ±0.5% typ. |
| Load Regulation (4) | 5% to 100% load | 1.0% typ. |
| Notes: Note4: Operation | below 5% load will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

| PROTECTIONS | | | | |
|--------------------------------|------------|---------------------|--------------------------------|--|
| Parameter | Ту | <i>у</i> ре | 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





RAC20-N

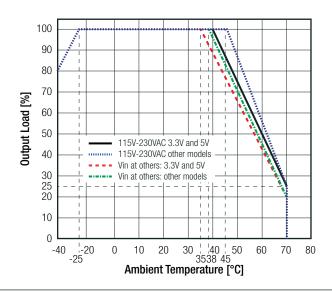
Series

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

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

Derating Graph

(@ Chamber and natural convection 0.1 m/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% Voltage Dips 30% Voltage Interruptions >95% | IEC61000-4-11:2004, Criteria A IEC61000-4-11:2004, Criteria A IEC61000-4-11:2004, Criteria C |

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RAC20-N

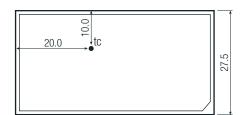
Series

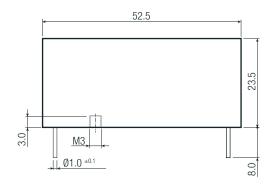
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

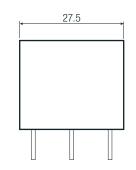
| DIMENSION AND PHYSICAL CHARACTERISTICS | | | |
|--|-----------------|---|--|
| Parameter | Туре | Value | |
| Material | case potting | plastic resin (UL94V-0) silicone (UL94V-0) | |
| Dimension (LxWxH) | | 52.5 x 27.5 x 23.5mm | |
| Weight | | 62g typ. | |

Dimension Drawing (mm)

FC 22.6







Pinning information

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

recommended tightening tourgue= 1.21Nm max. tc= case temperature measuring point

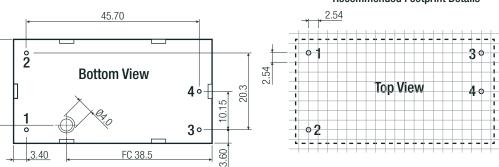
FC= fixing centers

Tolerance: $xx.x = \pm 0.5mm$

 $xx.xx = \pm 0.35mm$

Pin width: ± 0.05 mm

Recommended Footprint Details



PACKAGING INFORMATIONParameterTypeValuePackaging Dimension (LxWxH)cardboard box260.0 x 70.0 x 42.0mmPackaging Quantity8pcsStorage Temperature Range-40°C to +85°CStorage Humiditynon-condensing95% RH max.

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