

NOT RECOMMENDED FOR NEW DESIGNS!

RECOM
AC/DC Converter

Features

- Compact AC-DC power supply
- 20 Watt PCB mount package
- Universal input voltage range
- 3KVAC / 1 minute isolation
- Low output ripple and noise
- Short circuit protected
- Anti-vibration mechanical fixing

Regulated Converter

RAC20-B

**20 Watt
Single
Output**



Description

Compact switching AC/DC power module for PCB, screw-terminal connection or DIN-rail mounting. The converter is pin compatible with the RAC05-SB, RAC10-SB and RAC20-SN models. A threaded insert is provided for additional mechanical fixing.

Selection Guide

| Part Number | Input Voltage Range [VAC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ. ⁽¹⁾ [%] | Max. Capacitive Load [μ F] | Output Power max. [W] |
|----------------------------|---------------------------|----------------------|---------------------|------------------------------------|---------------------------------|-----------------------|
| RAC20-3.3SB ⁽²⁾ | 90 - 264 | 3.3 | 3600 | 74 | 4500 | 11.9 |
| RAC20-05SB ⁽²⁾ | 90 - 264 | 5 | 3600 | 78 | 3500 | 18 |
| RAC20-12SB ⁽²⁾ | 90 - 264 | 12 | 1660 | 82 | 1800 | 20 |
| RAC20-15SB ⁽²⁾ | 90 - 264 | 15 | 1330 | 83 | 1500 | 20 |
| RAC20-24SB ⁽²⁾ | 90 - 264 | 24 | 833 | 83 | 1200 | 20 |

Notes:

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

Model Numbering



Notes:

Note2: no suffix for standard package (THT)
add suffix "ST" for screw terminal module

Ordering Examples:

| | | | | |
|---------------|---------|--------|---------------|----------------|
| RAC20-05SB | 20 Watt | 5Vout | Single Output | THT |
| RAC20-24SB-ST | 20 Watt | 24Vout | Single Output | Screw Terminal |

PREFERRED ALTERNATIVES
Please consider these alternatives:

RAC20-K Series

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 ⁽³⁾ | nom. Vin = 230VAC | | 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 | | | | 470mW |
| Input Frequency Range | AC Input | | 47Hz | | 440Hz |
| Minimum Load | | | 0% | | |
| Hold-up Time | 115VAC 230VAC | | 12ms 56ms | | |
| Internal Operating Frequency | | | 100kHz | | 130kHz |
| Output Ripple and Noise ⁽⁴⁾ | 20MHz BW | Noise (3.3Vout, 5Vout) Ripple (3.3Vout, 5Vout) Ripple and Noise (Others) | | | 75mVp-p 120mVp-p 1.0% Vout |
| <p>Notes:</p> <p>Note3: The products were submitted for safety files at AC-Input operation</p> <p>Note4: Measurements are made with a 0.1µF and 47µF MLCC across output (low ESR)</p> | | | | | |

REGULATIONS

| Parameter | Condition | Value |
|---|----------------------------------|------------|
| Output Accuracy | | ±2.0% max. |
| Line Regulation | low line to high line, full load | ±0.5% typ. |
| Load Regulation ⁽⁵⁾ | 5% to 100% load | 1.0% typ. |
| <p>Notes:</p> <p>Note5: Operation below 5% load will not harm the converter, but specifications may not be met</p> | | |

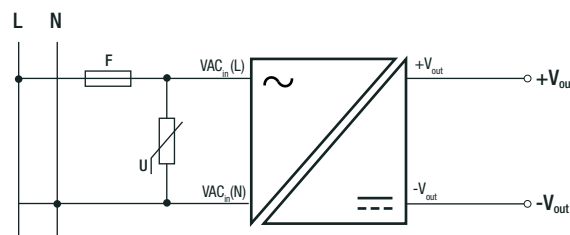
PROTECTIONS

| Parameter | Type | Value |
|----------------------------------|------------|------------------------------|
| Short Circuit Protection (SCP) | | Hiccup mode, auto recovery |
| Over Voltage Protection (OVP) | | zener diode clamp |
| Over Voltage Category | | OVC II |
| Isolation Voltage ⁽⁶⁾ | I/P to O/P | tested for 1 minute 3kVAC |
| Isolation Resistance | | 100MΩ min. |
| Leakage Current | | 0.75mA max. |

Notes:

- Note6: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type
- Note7: An external MOV is recommended. The varistor should comply with IEC-61051-2. e.g. 14S471K series

Protection Circuit

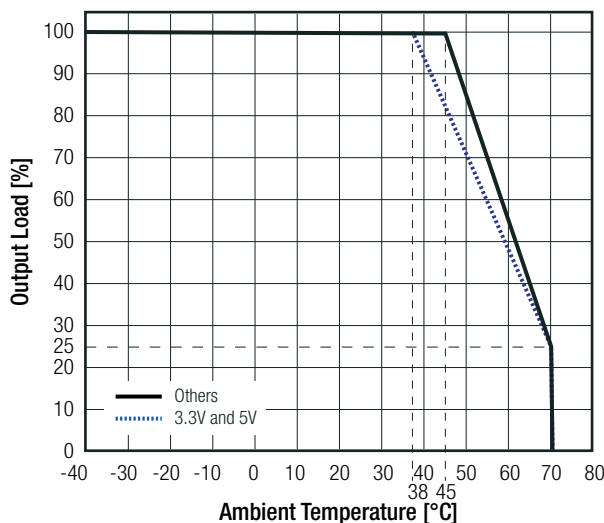


Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

| ENVIRONMENTAL | | | |
|-----------------------------|----------------------------------|-------------------------|------------------------------|
| Parameter | Condition | | Value |
| Operating Temperature Range | @ natural convection 0.1m/s | full load (3.3V, 5V) | -40°C to +38°C |
| | | full load (others) | -40°C to +45°C |
| | | refer to derating graph | -40°C to +70°C |
| Temperature Coefficient | | | ±0.02%/K typ. |
| Operating Humidity | non-condensing | | 95% RH max. |
| MTBF | according to MIL-HDBK-217F, G.B. | +25°C | >400 x 10 ³ hours |

Derating Graph

(@ Chamber and natural convection 0.1m/s)



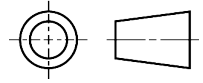
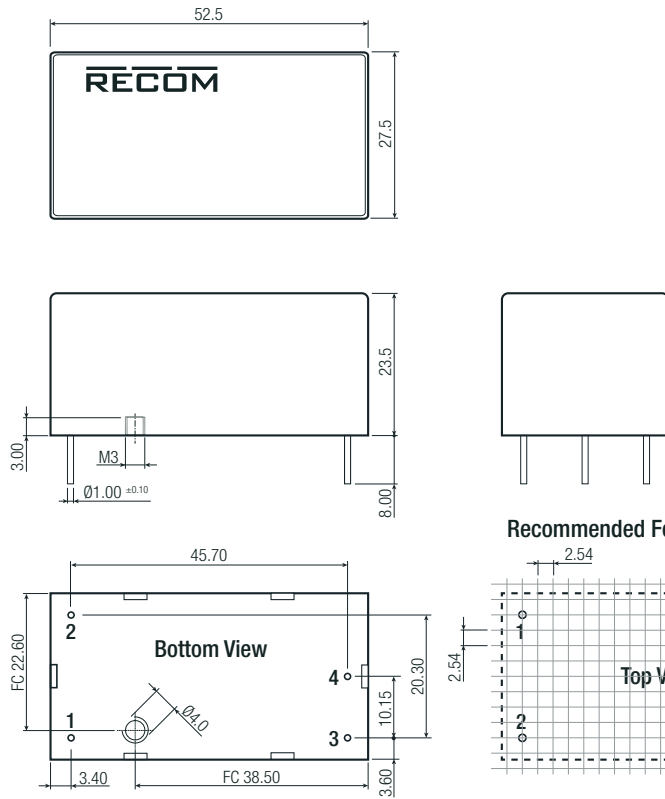
| SAFETY AND CERTIFICATIONS | | |
|---|------------------------|-------------------------------|
| Certificate Type (Safety) | Report / File Number | Standard |
| Information Technology Equipment, General Requirements for Safety | | EN60950-1:2006 + A2:2013 |
| EAC Safety of Low Voltage Equipment | RU-AT.49.09571 | TP TC 004/2011 |
| RoHS 2+ | | 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 | |

| DIMENSION AND PHYSICAL CHARACTERISTICS | | |
|--|-------------------|---------------------------------|
| Parameter | Type | Value |
| Material | case | epoxy with fibreglass (UL94V-0) |
| Dimension (LxWxH) | standard | 52.5 x 27.5 x 23.5mm |
| | with suffix "-ST" | 96.0 x 53.9 x 29.1mm |
| Weight | standard | 58g typ. |
| | with suffix "-ST" | 122g typ. |

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

Dimension Drawing (mm)



Pinning information

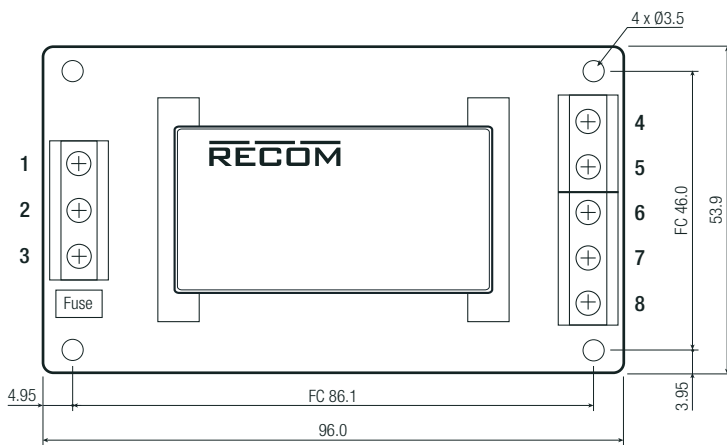
| Pin # | Single |
|-------|------------|
| 1 | VAC in (N) |
| 2 | VAC in (L) |
| 3 | +Vout |
| 4 | -Vout |

recommended tightening torque= 1.21Nm max.

FX= fixing centers

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

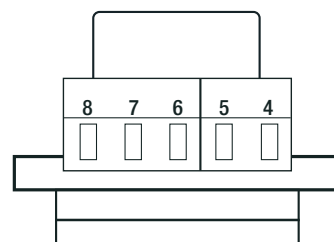
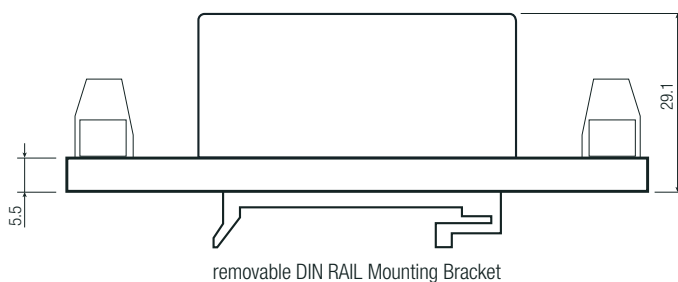
Screw Terminal Module "ST" version



Screw terminal information

| # | Single |
|---|------------|
| 1 | NC |
| 2 | VAC in (N) |
| 3 | VAC in (L) |
| 4 | NC |
| 5 | +Vout |
| 6 | -Vout |
| 7 | NC |
| 8 | NC |

7.5mm Pitch
suitable wire: 24-12AWG (0.5-2.5mm²)
wire stripping length: 7mm typ.
recommended tightening torque: 0.5Nm
NC = No Connection
FC = Fixing Centers
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm



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

PACKAGING INFORMATION

| Parameter | Type | | Value |
|---------------------------|-------------------------------|---------------|----------------|
| | Packaging Dimension (LxWxH) | cardboard box | |
| Packaging Quantity | standard with suffix "-ST" | | 8pcs 1pcs |
| Storage Temperature Range | | | -40°C to +85°C |
| Storage Humidity | non-condensing | | 95% RH |

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