

Features

- 20 Watt PCB mount package
- Universal input voltage range
- 3000VAC / 1 minute isolation
- Low output ripple and noise
- Short circuit protected
- UL certified, CE marked

Regulated Converter



RAC20-A

20 Watt
Single,
Dual, Double,
Triple Output



Description

Universal input voltage switching power module for PCB or DIN-rail mounting available with single, dual or triple output voltages.

Consider RAC20-K series for new designs

Selection Guide

| Part Number | Input Voltage Range [VAC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ ⁽¹⁾ [%] | Max. Capacitive Load [µF] |
|-----------------------------|---------------------------|----------------------|---------------------|-----------------------------------|---------------------------|
| RAC20-3.3SA ⁽²⁾ | 90-264 | 3.3 | 4500 | 75 | 25000 |
| RAC20-05SA ⁽²⁾ | 90-264 | 5 | 4000 | 79 | 13000 |
| RAC20-09SA ⁽²⁾ | 90-264 | 9 | 2230 | 82 | 1100 |
| RAC20-12SA ⁽²⁾ | 90-264 | 12 | 1670 | 83 | 920 |
| RAC20-15SA ⁽²⁾ | 90-264 | 15 | 1340 | 83 | 820 |
| RAC20-24SA ⁽²⁾ | 90-264 | 24 | 840 | 84 | 600 |
| RAC20-05DA ⁽²⁾ | 90-264 | ±5 | ±2000 | 79 | ±4300 |
| RAC20-12DA ⁽²⁾ | 90-264 | ±12 | ±833 | 82 | ±560 |
| RAC20-15DA ⁽²⁾ | 90-264 | ±15 | ±677 | 82 | ±220 |
| RAC20-0512TA ⁽²⁾ | 90-264 | 5/±12 | 2800/±250 | 81 | 3500/±200 |
| RAC20-0515TA ⁽²⁾ | 90-264 | 5/±15 | 2800/±200 | 81 | 3500/±150 |

Notes:

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



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

Model Numbering



Notes:

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

Ordering Examples:

| | | | | |
|-----------------|---------|-----------|---------------|----------------|
| RAC20-05SA | 20 Watt | 5Vout | Single Output | THT |
| RAC20-05DA | 20 Watt | ±5Vout | Dual Output | THT |
| RAC20-0512TA-ST | 20 Watt | 5/±12Vout | Triple Output | Screw Terminal |
| RAC20-15SA-ST | 20 Watt | 15Vout | Single Output | Screw Terminal |

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 100VDC | 230VAC | 264VAC 375VDC |
| Input Current | 115VAC 230VAC | | | | 400mA 270mA |
| Inrush Current | 2ms max. | 115VAC 230VAC | | | 30A 50A |
| No load Power Consumption | 115VAC/230VAC | | | | 470mW |
| Input Frequency Range | AC Input | | 47Hz | | 440Hz |
| Minimum Load | Single, Dual Triple | | 0% | 10% | |
| Hold-up Time | 115VAC/230VAC | | 13ms | | |
| Internal Operating Frequency | | | | 100kHz | |
| Output Ripple and Noise ⁽⁴⁾ | 20MHz BW | Noise Ripple | <0.5% Vout + 50mVp-p max. <0.2% Vout + 40mVp-p max. | | |

Notes:

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

Note4: Measurements are made with a 0.1µF and 47µF MLCC across output (low ESR)

REGULATIONS

| Parameter | Condition | | Value |
|--------------------------------|-----------------------|--------------------------|---|
| Output Accuracy | | | ±2.0% max. |
| Line Regulation | low line to high line | Single, Dual Triple | ±0.5% typ. ±1.0% typ. (+5Vout) / ±5.0 typ. (±Vout) |
| Load Regulation ⁽⁶⁾ | 10% to 100% load | Single Dual Triple | 1.0% typ. 3.0% typ. 2.0% typ. (+5Vout) / 5.0 typ. (±Vout) |

Notes:

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

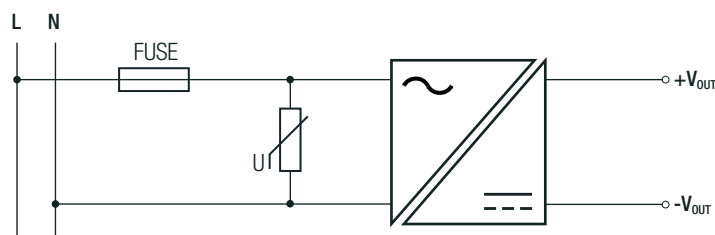
PROTECTIONS

| Parameter | Type | | Value |
|--------------------------------|------------|---------------------|----------------------------|
| Short Circuit Protection (SCP) | | | Hiccup mode, auto recovery |
| Over Voltage Protection (OVP) | | | zener diode clamp |
| Over Current Protection (OCP) | | | 105% typ. |
| Isolation Voltage | I/P to O/P | tested for 1 minute | 3kVAC |
| Leakage Current | | | 0.25mA 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



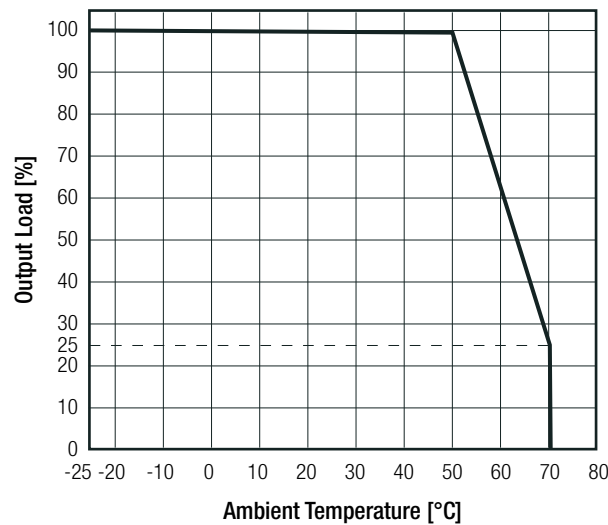
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

ENVIRONMENTAL

| Parameter | Condition | | Value |
|-----------------------------|----------------------------------|--------------------------------------|----------------------------------|
| Operating Temperature Range | @ natural convection 0.1 m/s | full load refer to derating graph | -25°C to +50°C -25°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 0.1 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 | | EN60950-1:2006 + 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 |

DIMENSION AND PHYSICAL CHARACTERISTICS

| Parameter | Type | Value |
|-------------------|-------------------|---------------------------------|
| Material | case | epoxy with fibreglass (UL94V-0) |
| Dimension (LxWxH) | standard | 70.0 x 48.0 x 22.0mm |
| | with suffix "-ST" | 111.9 x 64.6 x 27.5mm |
| Weight | standard | 122g typ. |
| | with suffix "-ST" | 197g typ. |

continued on next page

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

Dimension Drawing (mm)



Pin Connections

| Pin # | Single | Dual | Triple |
|-------|------------|------------|------------|
| 1 | FG | FG | FG |
| 2 | VAC in (N) | VAC in (N) | VAC in (N) |
| 3 | VAC in (L) | VAC in (L) | VAC in (L) |
| 4 | no Pin | no Pin | -Vout |
| 5 | -Vout | -Vout | Com |
| 6 | no Pin | Com | +Vout |
| 7 | +Vout | +Vout | +5V Rtn |
| 8 | no Pin | no Pin | +5Vout |

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

Screw Terminal Module "ST" version



Screw terminal information

| # | Single | Dual | Triple |
|---|------------|------------|------------|
| 1 | FG | FG | FG |
| 2 | VAC in (N) | VAC in (N) | VAC in (N) |
| 3 | VAC in (L) | VAC in (L) | VAC in (L) |
| 4 | NC | NC | -Vout |
| 5 | -Vout | -Vout | Com |
| 6 | NC | Com | +Vout |
| 7 | +Vout | +Vout | +5V Rtn |
| 8 | NC | NC | +5Vout |

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= ± 0.5 mm
xx.xx= ± 0.25 mm

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 | standard | 260.0 x 70.0 x 42.0mm |
| | | with suffix "-ST" | 119.0 x 64.0 x 54.0mm |
| Packaging Quantity | standard | | 3pcs |
| | with suffix "-ST" | | 1pcs |
| Storage Temperature Range | | | -40°C to +85°C |
| Storage Humidity | non-condensing | | 95% RH |

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