

# Features

# Regulated Converter

- 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



## RAC20-B

20 Watt  
Single  
Output



EN60950-1 certified  
EN55032 compliant  
EN55024 compliant

### 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.

## Consider RAC20-K series for new designs

### 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]
RAC20-3.3SB <sup>(2)</sup>	90 - 264	3.3	3600	74	4500	11.9
RAC20-05SB <sup>(2)</sup>	90 - 264	5	3600	78	3500	18
RAC20-12SB <sup>(2)</sup>	90 - 264	12	1660	82	1800	20
RAC20-15SB <sup>(2)</sup>	90 - 264	15	1330	83	1500	20
RAC20-24SB <sup>(2)</sup>	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

**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>(3)</sup>	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 <sup>(4)</sup>	20MHz BW	Noise (3.3Vout, 5Vout) Ripple (3.3Vout, 5Vout) Ripple and Noise (Others)			75mVp-p 120mVp-p 1.0% Vout
<p><b>Notes:</b></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 <sup>(5)</sup>	5% to 100% load	1.0% typ.
<p><b>Notes:</b></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 <sup>(6)</sup>	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



**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 <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		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

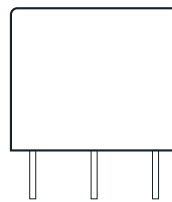
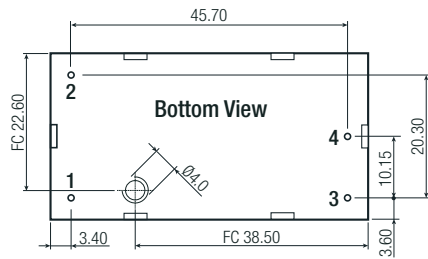
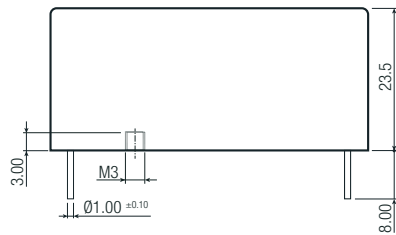
EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55032:2015, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
Limits for harmonic current emissions		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.

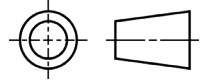
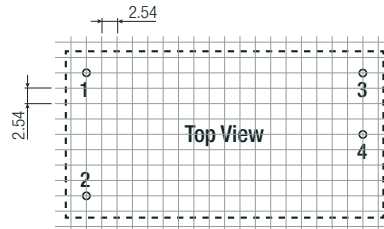
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Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

### Dimension Drawing (mm)



### Recommended Footprint Details



### Pinning information

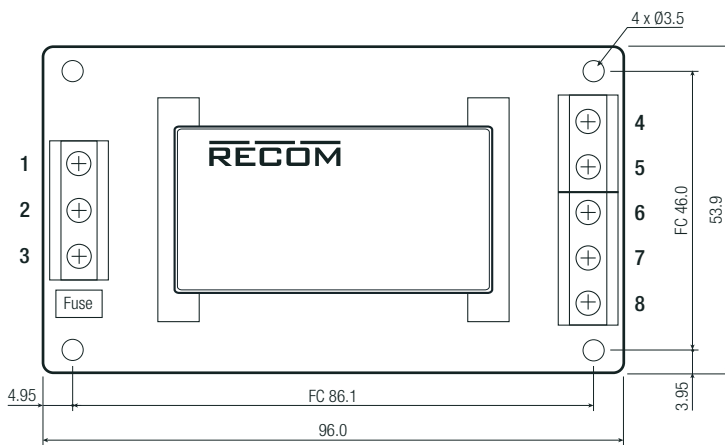
Pin #	Single
1	VAC in (N)
2	VAC in (L)
3	+Vout
4	-Vout

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 (0.5-2.5mm<sup>2</sup>)

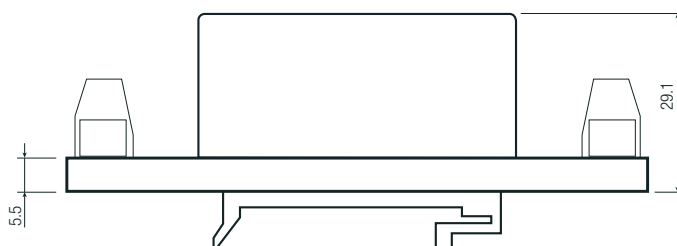
wire stripping length: 7mm typ.

recommended tightening torque: 0.5Nm

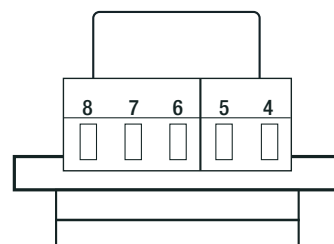
NC = No Connection

FC = Fixing Centers

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



removable DIN RAIL Mounting Bracket



**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		8pcs
	with suffix "-ST"		1pcs
Storage Temperature Range			-40°C to +85°C
Storage Humidity	non-condensing		95% RH

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