

!NOT RECOMMENDED FOR NEW DESIGNS!

LAST TIME BUY: 30TH OCT 2020, 3,3SA, 09SA, 15SA, 05DA, 12DA, 15DA, 0512TA, 0515TA
LAST TIME BUY: 30TH OCT 2020, SCREW TERMINAL VERSION

RECOM
AC/DC Converter

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.



Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ ⁽¹⁾ [%]	Max. Capacitive Load [μ F]
RAC20-05SA	90-264	5	4000	79	13000
RAC20-12SA	90-264	12	1670	83	920
RAC20-24SA	90-264	24	840	84	600

Notes:

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

NRND (Last time buy: 30th Oct 2020)

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



C **UL** US
E196683



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	\pm 5Vout	Dual Output	THT
RAC20-0512TA-ST	20 Watt	5/ \pm 12Vout	Triple Output	Screw Terminal
RAC20-15SA-ST	20 Watt	15Vout	Single Output	Screw Terminal

PREFERRED ALTERNATIVES
Please consider these alternatives:

RAC20-K Series

UL60950-1 certified
CSA C22.2 No. 60950-1-07 certified
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 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.
<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

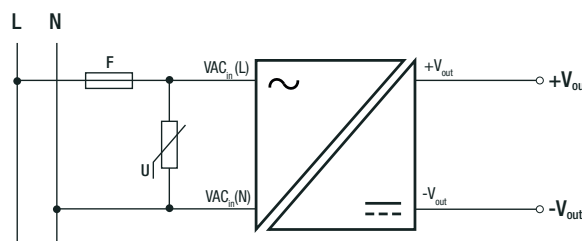
Parameter	Condition		Value
Output Accuracy			±2.0% max.
Line Regulation	low line to high line	Single, Dual Triple	±0.5% typ. ±1.0% typ. (+5Vout) / ±5.0 typ. (±Vout)
Load Regulation ⁽⁶⁾	10% to 100% load	Single Dual Triple	1.0% typ. 3.0% typ. 2.0% typ. (+5Vout) / 5.0 typ. (±Vout)
<p>Notes:</p> <p>Note5: Operation below 10% 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 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



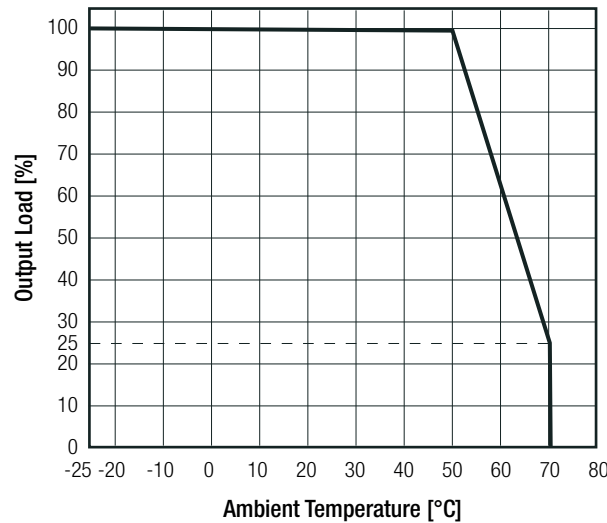
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/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 0.1m/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		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

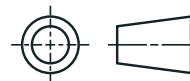
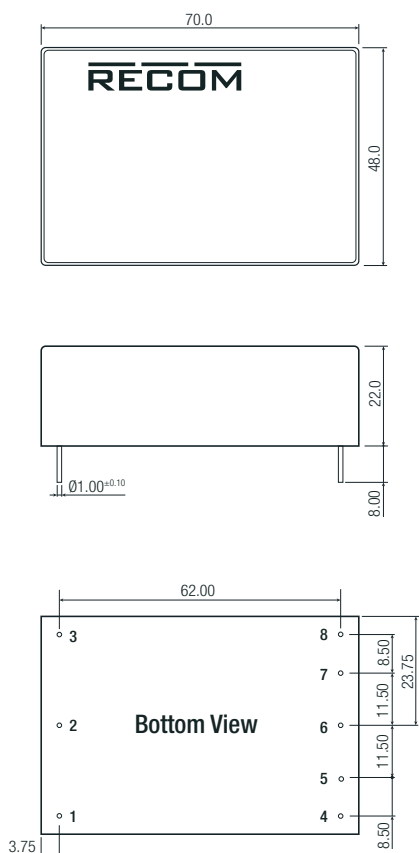
DIMENSION AND PHYSICAL CHARACTERISTICS

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.

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

Dimension Drawing (mm)

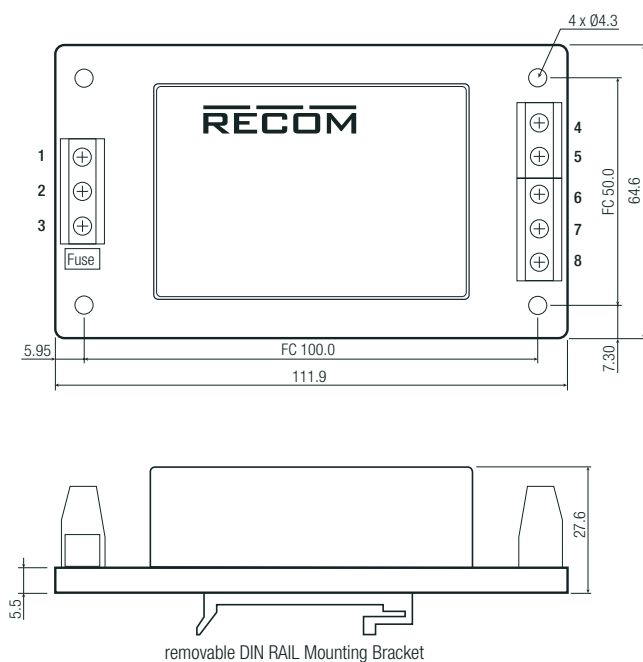


Pin Connections

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= ±0.5mm
 xx.xx= ±0.25mm

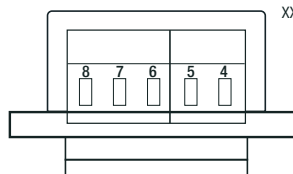
Screw Terminal Module "ST" version



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= ±0.5mm
 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	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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