Features

Regulated Converter

- 35mW max. no load power consumption
- Efficiency up to 76%
- Isolated output 3kVAC / 1 minute
- SCP, OVP protection
- Wide operating temperature range: -40°C to +85°C
- Universal input 85-305VAC

Description

The ultra-compact wired RAC02-SE/277/W modules are available with output voltages of 3.3, 5, 12 and 24V, and the input-to-output isolation is 3kVAC/1min. With a standby consumption of 35mW maximum, the mini power supplies are particularly suitable for energy-saving sleep mode and standby applications. Because of its compact design (height <18mm), it is a versatile solution for home automation and other similar applications. Complete with an integrated input filter, the series has enhanced EMI performance and complies with EN55032, class B. The mini power supplies are also protected against short circuit with fully automatic restart after the error has been solved. The converters are EN/UL60950-1 certified and come complete with a 3 year warranty.

Selection Guide					
Part Number	nom. Input Voltage Range [VAC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ ⁽¹⁾ [%]	Max. Capacitive Load ⁽²⁾ [µF]
RAC02-3.3SE/277/W	100-277	3.3	600	67	12000
RAC02-05SE/277/W	100-277	5.0	400	70	5500
RAC02-12SE/277/W	100-277	12	167	73	500
RAC02-24SE/277/W	100-277	24	83	76	160

Notes:

Note1: Efficiency is tested at 230VAC and full load at +25°C ambient Note2: Max Cap Load is tested at nominal input and full resisitive load

Model Numbering



Ordering Examples:

RAC02-05SE/277/W 2 Watt 5Vout Single Output Wired Version RAC02-12SE/277/W 2 Watt 12Vout Single Output Wired Version



RAC02-SE/277/W

2 Watt Single Output



















IEC/EN60950-1 certified CAN/CSA-22.2 No. 60950 certified UL60950-1 certified EN60335-1 certified EN55032 certified EN55024 certified EN55014 certified CB Report



Series

Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

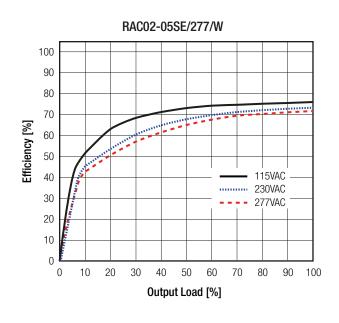
BASIC CHARACTERISTICS					
Parameter	Cond	Condition		Тур.	Max.
Input Voltage Range (3)	nom. Vin=	nom. Vin= 230VAC		277VAC	305VAC 430VDC
Input Current		115VAC 230VAC		47mA 30mA	
Inrush Current	cold start at +25°C	115VAC 230VAC			15A 30A
No load Power Consumption	85-305VAC	85-305VAC, 47-63Hz			35mW
Input Frequency Range	AC II	AC Input			440Hz
Minimum Load				2%	
Hold-up Time	115'	115VAC			
Internal Operating Frequency	100% load a	100% load at nominal Vin		55kHz	
Output Ripple and Noise (4)	3.3\ 5, 12, 2				300mVp-p 250mVp-p

Notes:

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

Note4: Ripple and Noise is the maximum peak-to-peak voltage value measured at the output with a 20MHz bandwidth, at rated line voltage at full load. And with a 47µF low-ESR electrolytic capacitor in parallel with a 0.1µF ceramic capacitor across output

Efficiency vs. Load



REGULATIONS				
Parameter	Condition	Value		
Output Voltage Tolerance (5)		±6.0% max.		
Line Regulation	low line to high line, full load	±1.5% max.		
Load Regulation	2% to 100% load	6.0% typ.		

Notes:

Note5: Includes initial voltage accuracy, thermal drift, line regulation and load regulation at rated input voltage and load conditions



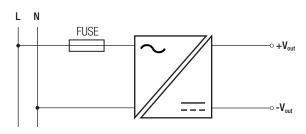
Series

Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

PROTECTIONS				
Parameter	Ту	pe	Value	
Short Circuit Protection (SCP)	below 100mΩ		continuous, automatic recovery	
Over Voltage Protection (OVP)	zener diode clamp		110% - 140%	
Over Current Limit			110% - 190%	
Over Voltage Category			OVCII	
Isolation Voltage	I/P to O/P	tested for 1 minute	3kVAC	
Isolation Resistance			1GΩ min.	
Leakage Current	85-305VAC, 47-63Hz		10µA max.	

Notes:

Note6: Refer to local wiring regulations if input over-current protection is also required. Recommended fuse: slow blow type

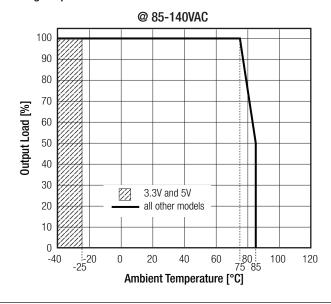


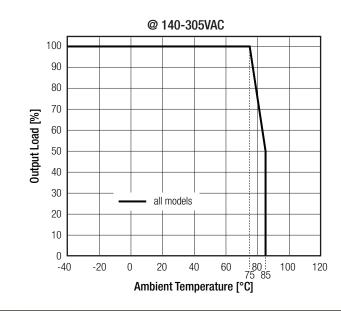
ENVIRONMENTAL				
Parameter	Condition			Value
Operating Temperature Range (7)	full load, 230V	full load, 230VAC		
Operating remperature hange **	refer to derating	refer to derating graph		
Maximum Case Temperature				+105°C
Thermal Impedance				8.5K/W typ.
Operating Humidity	non-condensing			5% - 95% RH max.
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	115VAC	2238 x 10 ³ hours
INITOI	according to MIL-HDBK-217F, G.B.	T23 0	230VAC	1670 x 10 ³ hours

Notes:

Note7: At low input voltage (85-140VAC) and temperature below -25°C the RAC02-3.3SE/277/W and RAC02-05SE/277/W, will not start

Derating Graph







Series

Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

SAFETY AND CERTIFICATIONS Cortificate Type (Safety)	Panart / Eila Numbar	Standard
Certificate Type (Safety)	Report / File Number	
Information Technology Equipment, General Requirements for Safety	L0339L26-CB-1-B4	IEC60950-1:2005 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
		UL No. 60950-1, 2nd Edition, 2014
Information Technology Equipment, General Requirements for Safety	E224736-X1-A24-UL	CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2014
Household and similar electrical appliances, General requirements	L0339L26-B2-L	EN60335-1:2012+A11:2014
EAC Safety of Low Voltage Equipment	RU-AT.37.02367	TP TC 004/2011
RoHS2	110 711.07.02007	RoHS-2011/65/EU + AM-2015/863
TOTOL		110110 2011/100/20 171111 2010/000
EMC Compliance (Industrial)	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment -		EN55032:2015, Class B
Emission requirements	1502CE17	EN33032.2013, Glass B
Information technology equipment - Immunity characteristics -	1302011	EN55024:2010
Limits and methods of measurement		
ESD Electrostatic discharge immunity test	±8.0kV air, ±4.0kV contact	EN61000-4-2:2009, Criteria B
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1.0kV	EN61000-4-4:2012, Criteria A
Power Magnetic Field Immunity	50Hz, 1 A/m	EN61000-4-8:2010, Criteria A
	Voltage Dips: >95% reduction	EN61000-4-11:2004, Criteria A
Voltage Dips and Interruption	>30% reduction	EN61000-4-11:2004, Criteria A
	Interruption: >95%	EN61000-4-11:2004, Criteria B
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013
EMC Compliance (Household)	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission		
Requirements	540440004	EN55014-1:2006+A2:2011
Information technology equipment - Immunity characteristics -	E16113001	ENERO(4.0.004F
Limits and methods of measurement		EN55014-2:2015
ESD Electrostatic discharge immunity test	±8.0kV air, ±4.0kV contact	IEC61000-4-2:2008, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3:2006 + A2:2010, Criteria A
Fact Transient and Duret Impounity	AC Power Port ±1.0kV	IEC61000-4-4:2012, Criteria A
Fast Transient and Burst Immunity	DC Output ±0.5kV	
Surge Immunity	AC Power Port L-N ±2.0kV	IEC61000-4-5:2014, Criteria B
Surge minuting	DC Output L-N ±1.0kV	illoo 1000-4-3.2014, Gillelia b
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port 3V, DC Output 3V	IEC61000-4-6:2013, Criteria A
	Voltage Dips: >95% reduction	IEC61000-4-11:2004, Criteria B
Voltage Dips and Interruption	>30% reduction	IEC61000-4-11:2004, Criteria C
	Interruption: >95%	IEC61000-4-11:2004, Criteria C
Limits of Harmonic Current Emissions		EN61000-3-2:2014
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

DIMENSION AND PHYSICAL CHARACTERISTICS				
Parameter	Туре	Value		
Material	case	black plastic, (UL94V-0)		
Material	potting	black plastic, (UL94V-0) epoxy, (UL94V-0)		
Dimension (LxWxH)		33.7 x 22.2 x 17.75mm		
Weight		25g typ.		
continued on next page				

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Series

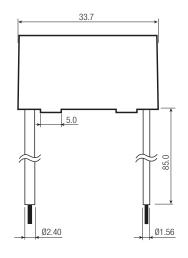
Specifications (measured @ Ta= 25°C, nom. Vin (115/230VAC), full load and after warm-up unless otherwise stated)

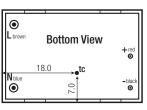
Dimension Drawing (mm)

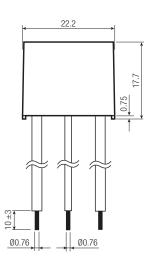












Wired Connections

Wired Color	Type	Function
_1, blue	UL-1015, AWG22	VAC in (N)
2, brown	UL-1015, AWG22	VAC in (L)
3, black	UL-1430, AWG22	-Vout
4, red	UL-1430, AWG22	+Vout

Tolerance: $xx.x = \pm 0.5$ mm $xx.xx = \pm 0.35$ mm

PACKAGING INFORMATION				
Parameter	Туре	Value		
Packaging Dimension (LxWxH)	cardboard box	520.0 x 195.0 x 68.0mm		
Packaging Quantity		30pcs		
Storage Temperature Bange		-40°C to +85°C		

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