## **Features**

### Regulated **Converters**

- Universal Input 80-264VAC or 115-370VDC
- Operating Temperature Range of -25°C to +85°C
- Isolated Output 3kVAC / 1 min
- Short Circuit and Overcurrent Protection
- Low Output Ripple & Noise
- Low Cost AC/DC Power Supply
- EN. UL and CE certified

#### **Description**

The ultra-compact wired RAC04-C/W modules are available with output voltages of 3.3, 5, 9, 12, 15, and 24V, and the input-to-output isolation is approximately 3kVAC/1min. With a standby consumption of 100mW typical, the mini power supplies are particularly suitable for energy-saving sleep mode and standby applications. Because of its compact design (height <17 mm), 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 EN55022, 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.

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Part	

Part Number	Input Voltage (VAC)	Output Voltage (VDC)	Output Current max. (mA)	Efficiency Typ. (%)	Capacitive Load max.
RAC04-3.3SC/W	80-264	3.3	1200	67	3000µF
RAC04-05SC/W	80-264	5	800	72	1600µF
RAC04-09SC/W	80-264	9	444	76	850µF
RAC04-12SC/W	80-264	12	333	77	150µF
RAC04-15SC/W	80-264	15	267	77	100μF
RAC04-24SC/W	80-264	24	167	79	82µF

#### **Specifications** (measured at TA 25°C, nominal input voltage, full load after warm-up)

Input Current (Full Load) 115VAC / 230VAC 110mA / 72mA max. Inrush Current 115VAC / 230VAC 30A / 60A max. No Load Power Consumption 80-264VAC 100mW typ. / 200mW max. Output Voltage (Vout nom.) 3.3V-24V Output Current Range 167mA - 1200mA Rated Output Power 4W max. Output Voltage Tolerance $\pm 2\%$ typ. / $\pm 5\%$ max. Minimum Load 0% Output Ripple & Noise (Full Load)115VAC / 230VAC @ 20MHz limited 200mVp-p max. Line Voltage Regulation LL-HL at full Load $\pm 0.5\%$ typ. / $\pm 15\%$ max. Over Load Protection 10%-100% Load $\pm 1.5\%$ typ. / $\pm 5\%$ max. Over Load Protection 105% - 155% Over Voltage Category OVC II Leakage Current 0.85 $\mu$ xA max. Operating Frequency Full Load 40kHz typ. Isolation Voltage Input-Output 3kVAC / 1 minute Isolation Resistance Input-Output 1G $\Omega$ min. Isolation Capacitance Input-Output 1000pF typ. Short Circuit Protection 40x10 in Input-Output 1000pF typ. Short Circuit Protection 40x10 in Input-Output 20x20 in Input-Output 1000pF typ. Short Circuit Protection 40x10 in Input-Output 40x10 in Input-O	Input Voltage Range (with Deratin	g)	80-264VAC or 115-370VDC
Inrush Current  115VAC / 230VAC  30A / 60A max.  No Load Power Consumption  80-264VAC  100mW typ. / 200mW max.  Output Voltage (Vout nom.)  3.3V-24V  Output Current Range  167mA - 1200mA  Rated Output Power  4W max.  Output Voltage Tolerance  ±2% typ. / ±5% max.  Minimum Load  0%  Output Ripple & Noise  (Full Load)115VAC / 230VAC @ 20MHz limited  200mVp-p max.  Line Voltage Regulation  LL-HL at full Load  ±0.5% typ. / ±1% max.  Load Voltage Regulation  10%-100% Load  ±1.5% typ. / ±5% max.  Over Load Protection  105% - 155%  Over Voltage Category  OVC II  Leakage Current  0.85μxA max.  Operating Frequency  Full Load  40kHz typ.  Isolation Voltage  Input-Output  3kVAC / 1 minute  Isolation Resistance  Input-Output  16 Ω min.  Isolation Capacitance  Input-Output  1000pF typ.  Short Circuit Protection  Operating Temperature Range  natural convection, without derating natural air convection, without derating natural air convection, with derating 1-20°C to +60°C  Storage Temperature Range  Case Material  UL94V-0 black plastic  Potting Material  Silicone  Relative Humidity  95% RH max.	Input Frequency (for AC Input)		47-63Hz
No Load Power Consumption 80-264VAC 100mW typ. / 200mW max. Output Voltage (Vout nom.) 3.3V-24V Output Current Range 167mA - 1200mA Rated Output Power 4W max. Output Voltage Tolerance ±2% typ. / ±5% max. Minimum Load 0% Output Ripple & Noise (Full Load)115VAC / 230VAC @ 20MHz limited 200mVp-p max. Line Voltage Regulation LL-HL at full Load ±0.5% typ. / ±1% max. Load Voltage Regulation 10%-100% Load ±1.5% typ. / ±5% max. Over Load Protection 105% - 155% Over Voltage Category 0VC II Leakage Current 0.85μxA max. Operating Frequency Full Load 40kHz typ. Isolation Voltage Input-Output 3kVAC / 1 minute Isolation Resistance Input-Output 16 Ω min. Isolation Capacitance Input-Output 1000pF typ. Short Circuit Protection 1000pF typ. Short Circuit Protection 1000pF typ. Short Circuit Protection 1000pF typ. Storage Temperature Range 1000pF typ. Storage Temperature Ran	Input Current (Full Load)	115VAC / 230VAC	110mA / 72mA max.
Output Voltage (Vout nom.)       3.3V-24V         Output Current Range       167mA - 1200mA         Rated Output Power       4W max.         Output Voltage Tolerance       ±2% typ. / ±5% max.         Minimum Load       0%         Output Ripple & Noise       (Full Load)115VAC / 230VAC @ 20MHz limited       200mVp-p max.         Line Voltage Regulation       LL-HL at full Load       ±0.5% typ. / ±1% max.         Load Voltage Regulation       10%-100% Load       ±1.5% typ. / ±5% max.         Over Load Protection       105% - 155%         Over Voltage Category       OVC II         Leakage Current       0.85µxA max.         Operating Frequency       Full Load       40kHz typ.         Isolation Voltage       Input-Output       3kVAC / 1 minute         Isolation Resistance       Input-Output       16 Ω min.         Isolation Capacitance       Input-Output       1000pF typ.         Short Circuit Protection       Hiccup, Auto Restart         Operating Temperature Range       natural convection, without derating       -20°C to +60°C         Storage Temperature Range       natural convection, with derating       -25°C to +85°C         Case Material       UL94V-0 black plastic         Potting Material       Silicone <td>Inrush Current</td> <td>115VAC / 230VAC</td> <td>30A / 60A max.</td>	Inrush Current	115VAC / 230VAC	30A / 60A max.
Output Current Range       167mA - 1200mA         Rated Output Power       4W max.         Output Voltage Tolerance       ±2% typ. / ±5% max.         Minimum Load       0%         Output Ripple & Noise       (Full Load)115VAC / 230VAC @ 20MHz limited       200mVp-p max.         Line Voltage Regulation       LL-HL at full Load       ±0.5% typ. / ±1% max.         Load Voltage Regulation       10%-100% Load       ±1.5% typ. / ±5% max.         Over Load Protection       105% - 155%         Over Voltage Category       OVC II         Leakage Current       0.85µxA max.         Operating Frequency       Full Load       40kHz typ.         Isolation Voltage       Input-Output       3kVAC / 1 minute         Isolation Resistance       Input-Output       16 Ω min.         Isolation Capacitance       Input-Output       1000pF typ.         Short Circuit Protection       Hiccup, Auto Restart         Operating Temperature Range       natural convection, with derating       -20°C to +60°C         Case Material       UL94V-0 black plastic         Potting Material       Silicone         Relative Humidity       95% RH max.	No Load Power Consumption	80-264VAC	100mW typ. / 200mW max.
At W max.Output Voltage Tolerance±2% typ. / ±5% max.Minimum Load0%Output Ripple & Noise(Full Load)115VAC / 230VAC @ 20MHz limited200mVp-p max.Line Voltage RegulationLL-HL at full Load±0.5% typ. / ±1% max.Load Voltage Regulation10%-100% Load±1.5% typ. / ±5% max.Over Load Protection105% - 155%Over Voltage CategoryOVC IILeakage Current0.85µxA max.Operating FrequencyFull Load40kHz typ.Isolation VoltageInput-Output3kVAC / 1 minuteIsolation ResistanceInput-Output16 Ω min.Isolation CapacitanceInput-Output1000pF typ.Short Circuit ProtectionHiccup, Auto RestartOperating Temperature Rangenatural convection, without derating-20°C to +60°Cnatural air convection, with derating-25°C to +85°CStorage Temperature Rangenatural convection, with derating-25°C to +80°CCase MaterialUL.94V-0 black plasticPotting MaterialSiliconeRelative Humidity95% RH max.	Output Voltage (Vout nom.)		3.3V-24V
Output Voltage Tolerance±2% typ. / ±5% max.Minimum Load0%Output Ripple & Noise(Full Load)115VAC / 230VAC @ 20MHz limited200mVp-p max.Line Voltage RegulationLL-HL at full Load±0.5% typ. / ±1% max.Load Voltage Regulation10%-100% Load±1.5% typ. / ±5% max.Over Load Protection105% - 155%Over Voltage CategoryOVC IILeakage Current0.85µxA max.Operating FrequencyFull Load40kHz typ.Isolation VoltageInput-Output3kVAC / 1 minuteIsolation ResistanceInput-Output16 Ω min.Isolation CapacitanceInput-Output1000pF typ.Short Circuit ProtectionHiccup, Auto RestartOperating Temperature Rangenatural convection, without derating natural air convection, with derating natural air convection, with derating-20°C to +60°CCase MaterialUL94V-0 black plasticPotting MaterialSiliconeRelative Humidity95% RH max.	Output Current Range		167mA - 1200mA
Minimum Load0%Output Ripple & Noise(Full Load)115VAC / 230VAC @ 20MHz limited200mVp-p max.Line Voltage RegulationLL-HL at full Load±0.5% typ. / ±1% max.Load Voltage Regulation10%-100% Load±1.5% typ. / ±5% max.Over Load Protection105% - 155%Over Voltage CategoryOVC IILeakage Current0.85μxA max.Operating FrequencyFull Load40kHz typ.Isolation VoltageInput-Output3kVAC / 1 minuteIsolation ResistanceInput-Output16 Ω min.Isolation CapacitanceInput-Output1000pF typ.Short Circuit ProtectionHiccup, Auto RestartOperating Temperature Rangenatural convection, without derating natural air convection, with derating-20°C to +60°CCase MaterialUL94V-0 black plasticPotting MaterialSiliconeRelative Humidity95% RH max.	Rated Output Power		4W max.
Output Ripple & Noise(Full Load)115VAC / 230VAC @ 20MHz limited200mVp-p max.Line Voltage RegulationLL-HL at full Load±0.5% typ. / ±1% max.Load Voltage Regulation10%-100% Load±1.5% typ. / ±5% max.Over Load Protection105% - 155%Over Voltage CategoryOVC IILeakage Current0.85µxA max.Operating FrequencyFull Load40kHz typ.Isolation VoltageInput-Output3kVAC / 1 minuteIsolation ResistanceInput-Output1G Ω min.Isolation CapacitanceInput-Output1000pF typ.Short Circuit ProtectionHiccup, Auto RestartOperating Temperature Rangenatural convection, without derating natural air convection, with derating-20°C to +60°CStorage Temperature Range-40°C to +100°CCase MaterialUL94V-0 black plasticPotting MaterialSiliconeRelative Humidity95% RH max.	Output Voltage Tolerance		±2% typ. / ±5% max.
Line Voltage Regulation LL-HL at full Load $\pm 0.5\%$ typ. $/ \pm 1\%$ max. Load Voltage Regulation $10\%$ - $100\%$ Load $\pm 1.5\%$ typ. $/ \pm 5\%$ max. Over Load Protection $10\%$ - $15\%$ Over Voltage Category $0$ VC II Leakage Current $0.85\mu$ XA max. Operating Frequency Full Load $40$ KHz typ. Isolation Voltage Input-Output $3$ KVAC $/ 1$ minute Isolation Resistance Input-Output $16\Omega$ min. Isolation Capacitance Input-Output $1000$ pF typ. Short Circuit Protection Input-Output $1000$ pF typ. Short Circuit Protection Inatural air convection, without derating $-20^{\circ}$ C to $+60^{\circ}$ C Storage Temperature Range $-40^{\circ}$ C to $+60^{\circ}$ C Storage Temperature Range $-40^{\circ}$ C to $+100^{\circ}$ C Case Material UL94V-0 black plastic Potting Material Silicone Relative Humidity $95\%$ RH max.	Minimum Load		0%
Load Voltage Regulation10%-100% Load±1.5% typ. / ±5% max.Over Load Protection105% - 155%Over Voltage CategoryOVC IILeakage Current0.85μxA max.Operating FrequencyFull Load40kHz typ.Isolation VoltageInput-Output3kVAC / 1 minuteIsolation ResistanceInput-Output1G Ω min.Isolation CapacitanceInput-Output1000pF typ.Short Circuit ProtectionHiccup, Auto RestartOperating Temperature Rangenatural convection, without derating natural air convection, with derating-20°C to +60°CStorage Temperature Range-40°C to +100°CCase MaterialUL94V-0 black plasticPotting MaterialSiliconeRelative Humidity95% RH max.	Output Ripple & Noise (Full I	Load)115VAC / 230VAC @ 20MHz limited	200mVp-p max.
Over Load Protection       105% - 155%         Over Voltage Category       OVC II         Leakage Current       0.85μxA max.         Operating Frequency       Full Load       40kHz typ.         Isolation Voltage       Input-Output       3kVAC / 1 minute         Isolation Resistance       Input-Output       1000pF typ.         Short Circuit Protection       Hiccup, Auto Restart         Operating Temperature Range       natural convection, without derating natural air convection, with derating -25°C to +60°C natural air convection, with derating       -25°C to +85°C         Storage Temperature Range       -40°C to +100°C       UL94V-0 black plastic         Potting Material       Silicone         Relative Humidity       95% RH max.	Line Voltage Regulation	LL-HL at full Load	±0.5% typ. / ±1% max.
Over Voltage Category       OVC II         Leakage Current       0.85μxA max.         Operating Frequency       Full Load       40kHz typ.         Isolation Voltage       Input-Output       3kVAC / 1 minute         Isolation Resistance       Input-Output       1000pF typ.         Short Circuit Protection       Hiccup, Auto Restart         Operating Temperature Range       natural convection, without derating natural air convection, with derating       -20°C to +60°C         Storage Temperature Range       -40°C to +100°C         Case Material       UL94V-0 black plastic         Potting Material       Silicone         Relative Humidity       95% RH max.	Load Voltage Regulation	10%-100% Load	±1.5% typ. / ±5% max.
Leakage Current       0.85 μxA max.         Operating Frequency       Full Load       40kHz typ.         Isolation Voltage       Input-Output       3kVAC / 1 minute         Isolation Resistance       Input-Output       16 Ω min.         Isolation Capacitance       Input-Output       1000pF typ.         Short Circuit Protection       Hiccup, Auto Restart         Operating Temperature Range       natural convection, without derating natural air convection, with derating       -25°C to +85°C         Storage Temperature Range       -40°C to +100°C         Case Material       UL94V-0 black plastic         Potting Material       Silicone         Relative Humidity       95% RH max.	Over Load Protection		105% - 155%
Operating Frequency       Full Load       40kHz typ.         Isolation Voltage       Input-Output       3kVAC / 1 minute         Isolation Resistance       Input-Output       1G Ω min.         Isolation Capacitance       Input-Output       1000pF typ.         Short Circuit Protection       Hiccup, Auto Restart         Operating Temperature Range       natural convection, without derating natural air convection, with derating natural air convection, with derating respective to +85°C         Storage Temperature Range       -40°C to +100°C         Case Material       UL94V-0 black plastic         Potting Material       Silicone         Relative Humidity       95% RH max.	Over Voltage Category		OVC II
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Leakage Current		0.85µxA max.
Isolation Resistance Input-Output $16 \Omega min.$ Isolation Capacitance Input-Output $1000pF typ.$ Short Circuit Protection Hiccup, Auto Restart Operating Temperature Range natural convection, without derating $-20^{\circ}C to +60^{\circ}C$ Norage Temperature Range natural air convection, with derating $-25^{\circ}C to +85^{\circ}C$ Storage Temperature Range $-40^{\circ}C to +100^{\circ}C$ Case Material UL94V-0 black plastic Potting Material Silicone Relative Humidity 95% RH max.	Operating Frequency	Full Load	40kHz typ.
Isolation Capacitance Input-Output 1000pF typ.  Short Circuit Protection Hiccup, Auto Restart  Operating Temperature Range natural convection, without derating -20°C to +60°C natural air convection, with derating -25°C to +85°C  Storage Temperature Range -40°C to +100°C  Case Material UL94V-0 black plastic  Potting Material Silicone  Relative Humidity 95% RH max.	Isolation Voltage	Input-Output	3kVAC / 1 minute
Short Circuit Protection  Operating Temperature Range natural convection, without derating natural air convection, with derating -25°C to +85°C  Storage Temperature Range Case Material  Potting Material  Relative Humidity  Hiccup, Auto Restart  -20°C to +60°C -25°C to +85°C  U-94°C to +100°C  UL94V-0 black plastic Silicone	Isolation Resistance	Input-Output	1G $\Omega$ min.
Operating Temperature Range natural convection, without derating -20°C to +60°C natural air convection, with derating -25°C to +85°C Storage Temperature Range -40°C to +100°C Case Material UL94V-0 black plastic Potting Material Silicone Relative Humidity 95% RH max.	Isolation Capacitance	Input-Output	1000pF typ.
natural air convection, with derating -25°C to +85°C  Storage Temperature Range -40°C to +100°C  Case Material UL94V-0 black plastic  Potting Material Silicone  Relative Humidity 95% RH max.	Short Circuit Protection		Hiccup, Auto Restart
Storage Temperature Range -40°C to +100°C Case Material UL94V-0 black plastic Potting Material Silicone Relative Humidity 95% RH max.	Operating Temperature Range	natural convection, without derating	-20°C to +60°C
Case MaterialUL94V-0 black plasticPotting MaterialSiliconeRelative Humidity95% RH max.		natural air convection, with derating	-25°C to +85°C
Potting Material Silicone Relative Humidity 95% RH max.	Storage Temperature Range		-40°C to +100°C
Relative Humidity 95% RH max.	Case Material		UL94V-0 black plastic
	Potting Material		Silicone
Package Weight 32g typ.	Relative Humidity		95% RH max.
	Package Weight		32g typ.

continued on next page

## **POWERLINE**

AC/DC-Converter with 3 year Warranty



# 4 Watt Single Output



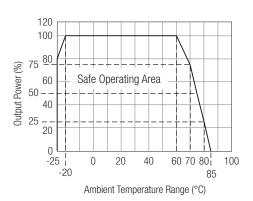


EN-60950-1 Certified IEC-60950-1 Certified **UL-60950-1** Certified

RACO4-C/W

# **Derating-Graph**

(Ambient Temperature)



## **POWERLINE**

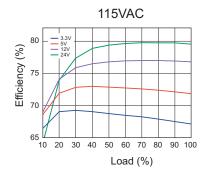
## AC/DC-Converter

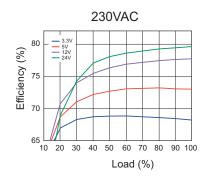
# RACO4-xxxC/W Series

<b>Specifications</b> (measured at TA 25°C, nominal input voltage, full load after warm-up)				
Package Quantity		30pcs		
Physical	Dimension (LxWxH)	37.80 x 23.90 x 16.40 mm		
MTBF	115VAC, 25°C	820 x 10 <sup>3</sup> hours		
	230VAC, 25°C	735 x 10 <sup>3</sup> hours		
	115VAC, 60°C	550 x 10 <sup>3</sup> hours		
	230VAC, 25°C	430 x 10 <sup>3</sup> hours		
EMC	Conducted and Radiated	EN55022, Class B		
	Noise Immunity	EN55024		
Safety Standard				
EN General Safety	Report: SPCLVD1310055-1	EN-60950-1, 3rd Edition		
IEC General Safety	CB Report: 1311055-CB	IEC-60950-1 2nd Edition		
UL General Safety	Report Number: E224736-A21	UL-60950-1, 2nd Edition		
		CSA C22.2 No. 60950-1-07		

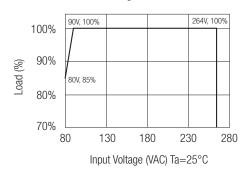
#### **Typical Characteristic**

# Input Voltage Derating Graph

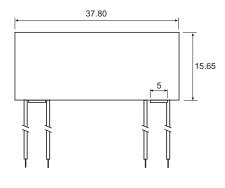


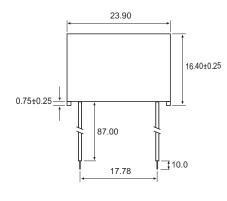


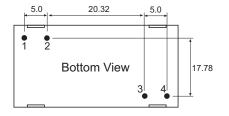
## Efficiency vs Load



### **Package Style and Pinning**









#### Wired Connections

Wi	red Color	Туре	Function
1	Brown	UL-1015 AWG#22	VAC in (L)
2	Blue	UL-1015 AWG#22	VAC in (N)
3	Red	UL-1430 AWG#22	+VDC out
4	Black	UL-1430 AWG#22	-VDC out

Case Tolerance ±0.5mm
Unless otherwise specified

The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.