

Features

Unregulated Converters

- UL/CSA and EN Safety certified
- EN-60601 for Medical Applications
- Isolation 6.4kVDC
- Optional Continuous Short Circuit Protected
- Unique Transformer System
- Compact SIP7 Package
- /X2 Version with >9mm Input/Output Clearance
- Very Low Isolation Capacitance

Description

The RxxP2xxS_D Series of DC/DC Converters are certified to UL/CSA-60950 and UL/CSA 60601 as well as EN-60950 and EN60601. This makes them ideal for medical and safety applications where approved isolation is required. The /X2 version has an input/output clearance of more than 9mm.

Selection Guide

Part Number SIP 7	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency Std (%)	Max Capacitive Load ⁽¹⁾
RxxP23.3S*	5, 12, 15, 24	3.3	600	70	3300µF
RxxP205S*	5, 12, 15, 24	5	400	70-75	1200µF
RxxP209S*	5, 12, 15, 24	9	222	70-75	1200µF
RxxP212S*	5, 12, 15, 24	12	167	70-75	680µF
RxxP215S*	5, 12, 15, 24	15	132	75-80	680µF
RxxP23.3D*	5, 12, 15, 24	±3.3	±300	70	±1500µF
RxxP205D*	5, 12, 15, 24	±5	±200	70-75	±470µF
RxxP209D*	5, 12, 15, 24	±9	±111	70-75	±470µF
RxxP212D*	5, 12, 15, 24	±12	±85	70-75	±330µF
RxxP215D*	5, 12, 15, 24	±15	±66	75-80	±330µF

xx = Input Voltage. Other input and output voltage combinations available on request.

* add Suffix "P" for Continuous Short Circuit Protection, e.g. R05P205S/P, R05P205D/P

* add Suffix "/X2" for single output with alternative pinout, e.g. R05P205S/X2, R05P205S/P/X2

Specifications (measured at $T_A = 25^\circ\text{C}$, nominal input voltage, full load and after warm-up)

Input Voltage Range		±10%
Output Voltage Accuracy		±5%
Line Voltage Regulation		1.2%/1% of V_{in} typ.
Load Voltage Regulation	3.3, 5V output types	15% max.
(10% to 100% full load)	other output types	10% max.
Output Ripple and Noise (20MHz BW)		200mVp-p max.
Operating Frequency		20kHz min. / 50kHz typ. / 85kHz max.
Efficiency at Full Load		65% min. / 80% max.
Minimum Load = 0%		Specifications valid for 10% minimum load only.
Isolation Voltage	(tested for 1 second)	6400VDC
	(rated for 1 minute**)	3200VAC / 60Hz
Isolation Capacitance		1.5pF min / 10pF max.
Isolation Resistance		15 GΩ min.
Short Circuit Protection		1 Second
P-Suffix		Continuous

continued on next page

**Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.

ECONOLINE

DC/DC-Converter

with 3 year Warranty

RECOM

2 Watt

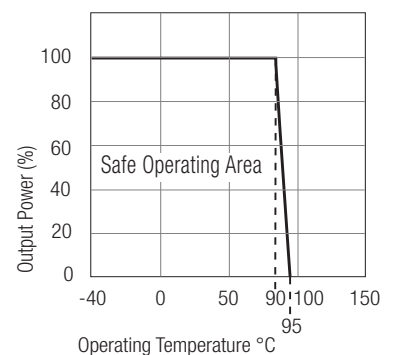
SIP 7 Single & Dual Output



EN-60950-1 Certified
IEC/EN-60601-1 Certified
UL/CSA 60950-1 Certified

RxxP2xx

Derating-Graph (Ambient Temperature)



www.recom-power.com/eval-ref-boards

www.recom-power.com

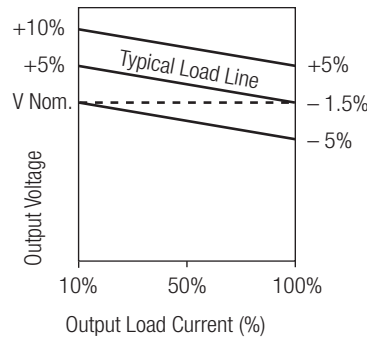
Specifications (measured at $T_A = 25^\circ\text{C}$, nominal input voltage, full load and after warm-up)

Operating Temperature Range (free air convection, without derating)	-40°C to +90°C (see Graph)		
Storage Temperature Range	-55°C to +125°C		
Relative Humidity	95% RH		
Package Weight	4.3g		
Packing Quantity	25 pcs per Tube		
MTBF (+25°C)	Detailed Information see Application Notes chapter "MTBF"	Single/Dual using MIL-HDBK 217F	2113/2434 x 10 ³ hours
(+85°C)		Single/Dual using MIL-HDBK 217F	299/334 x 10 ³ hours
Certifications			
UL/cUL General Safety	Report: E358085-A8	UL 60950-1 2nd Ed.	
EN General Safety	Report: SPCLVD1305069	EN60950-1:2006 + A12: 2011	
EN Medical Safety	Report: SPCMDD1205098-4	IEC/EN60601-1:2006, 3rd Edition	

Notes

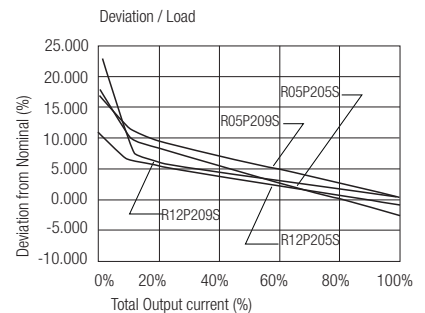
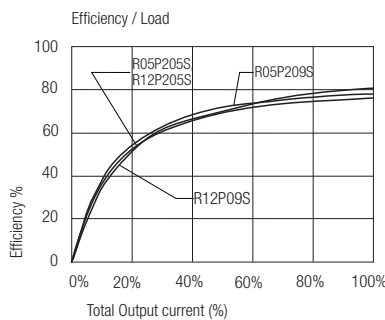
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

Tolerance Envelope

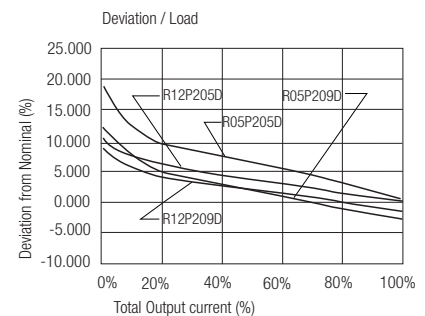
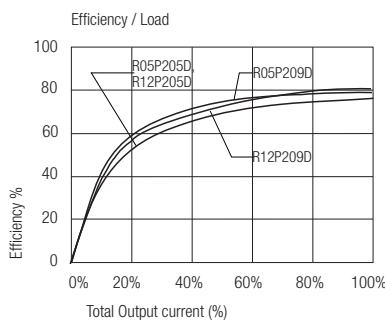


Typical Characteristics

RxxP205S
RxxP209S

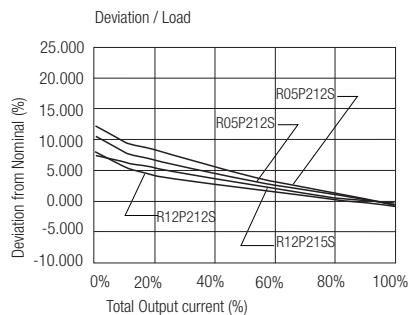
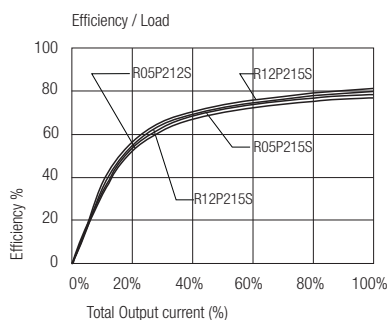


R05P205D
R05P209D

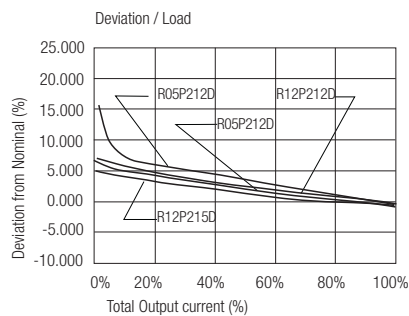
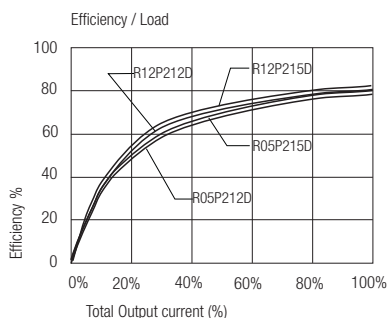


Typical Characteristics

RxxP212S RxxP215S

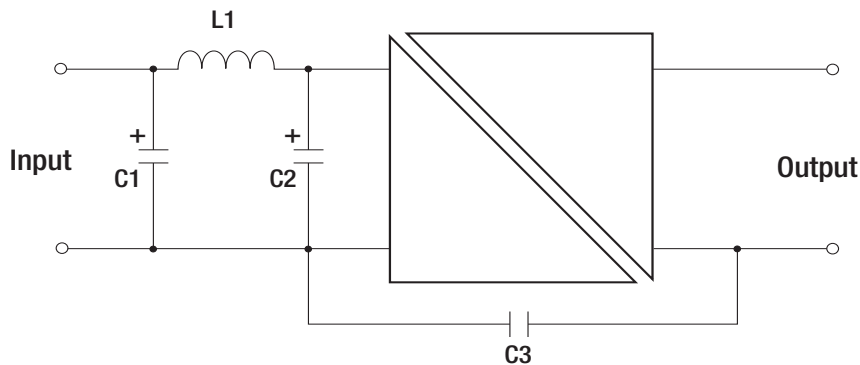


RxxP212D RxxP215D



RxxP2xx

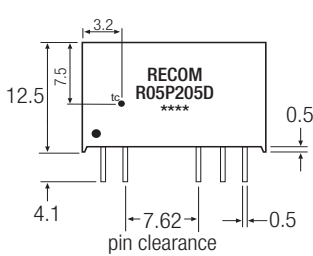
EMC Filter Suggestions for EN55022 Class A and B



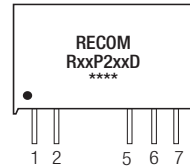
	C1	L1	C2	C3
EN55022 Class A	10 μ F	NA	NA	NA
EN55022 Class B	10 μ F	470 μ H WE 7447471471	10 μ F	2n2F 8kV Vishay HGZ222MBP

Package Style and Pinning (mm)

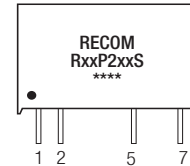
7 PIN SIP Package



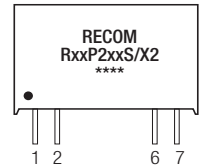
Dual Output



Single Output

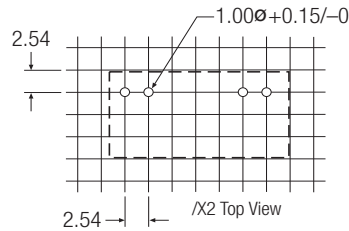
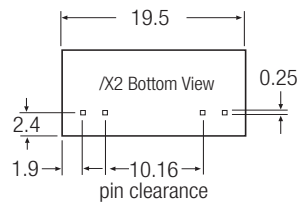
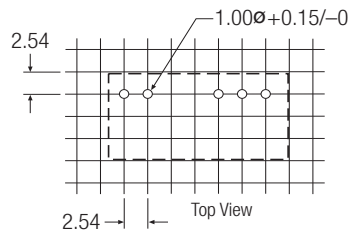
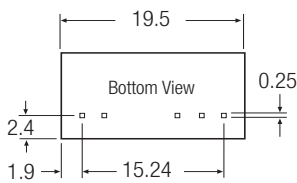


/X2 Single Output



RxxP2xx

Recommended Footprint Details



Pin Connections

Pin #	Single	Dual	/X2
1	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin
5	-Vout	-Vout	No Pin
6	No Pin	Com	-Vout
7	+Vout	+Vout	+Vout

XX.X ± 0.5 mm

XX.XX ± 0.25 mm

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant 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.