

# Features

## Unregulated Converters

- UL/CSA and EN Safety certified
- EN-61010 for Test, Measurement and Lab Use
- EN-60601 for Medical Applications
- Reinforced Isolation 6.4kVDC or 8kVDC
- Optional Continuous Short Circuit Protected
- Compact SIP7 Package
- Efficiency to 88%
- Very Low Isolation Capacitance
- /X2 Version with >9mm Input/Output Clearance

### Description

The RxxP2xxS\_D Series of DC/DC Converters are certified to UL/CSA-60950 and UL/CSA 60601. This makes them ideal for medical and safety applications where approved or reinforced isolation is required. The reinforced versions are also EN61010-1 certified for Lab Equipment. The /X2 version has an input/output clearance of more than 9mm.

### Selection Guide

Part Number SIP 7	Reinforced Isolation (kVDC)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency Std (%)	Max Capacitive Load <sup>(1)</sup>
RxxP23.3S	/R6.4 & /R8	5, 12, 15, 24	3.3	600	72-78	3300µF
RxxP205S	/R6.4 & /R8	5, 12, 15, 24	5	400	79-84	1200µF
RxxP209S	/R6.4 & /R8	5, 12, 15, 24	9	222	80-87	1200µF
RxxP212S	/R6.4 & /R8	5, 12, 15, 24	12	167	80-87	680µF
RxxP215S	/R6.4 & /R8	5, 12, 15, 24	15	132	80-88	680µF
RxxP23.3D	/R6.4 & /R8	5, 12, 15, 24	±3.3	±300	73-80	±1500µF
RxxP205D	/R6.4 & /R8	5, 12, 15, 24	±5	±200	79-85	±470µF
RxxP209D	/R6.4 & /R8	5, 12, 15, 24	±9	±111	80-87	±470µF
RxxP212D	/R6.4 & /R8	5, 12, 15, 24	±12	±85	80-87	±330µF
RxxP215D	/R6.4 & /R8	5, 12, 15, 24	±15	±66	80-88	±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

\* add Suffix "/R6.4" or "/R8" for Reinforced Isolation, e.g. R05P205D/R6.4, R05P205S/P/X2/R8

### Specifications (measured at T<sub>A</sub> = 25°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 Vin 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	/R6.4 (tested for 1 second)	6400VDC
	(rated for 1 minute**)	3200VAC / 60Hz
	/R8 (tested for 1 second)	8000VDC
	(rated for 1 minute**)	4000VAC / 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



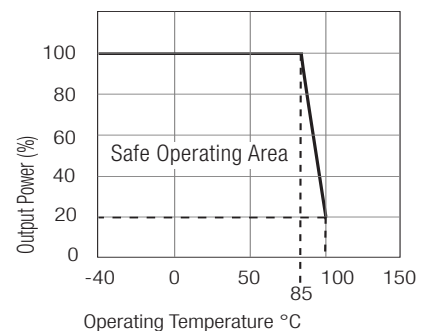
E-224736 C US

- EN-60950-1 Certified
- EN-60601-1 Certified
- UL/CSA 60950-1 Certified
- UL-60601 Certified
- EN-61010-1 Certified
- IEC-60601-1 CB Report

# RxxP2xx/R

## Derating-Graph

(Ambient Temperature)



Refer to Application Notes

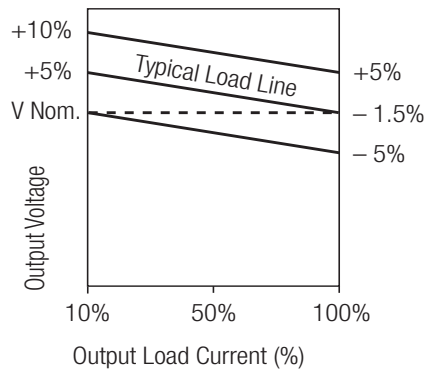
**Specifications** (measured at  $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

Operating Temperature Range (free air convection)		-40°C to +85°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	
Potting Material		Silicone Rubber Compound (UL94V-0)	
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	Reinforced	1154 x 10 <sup>3</sup> hours
(+85°C)		Reinforced	168 x 10 <sup>3</sup> hours
Reinforced Isolation	Transformer Creepage	/R6.4 Types	5.5 mm min.
	Transformer Clearance	/R6.4 Types	5.5 mm min.
	PCB Creepage & Clearance	/R6.4 Types	4.6 mm min.
Certifications			
Measurement, Control and Laboratory Use Safety		Report: T1301251-313	EN 61010-1 : 2010
	CSA General Safety	Report: 2207629	UL 60950-1 1st Edition C22.2 No. 60950-1-03
	UL/cUL Medical Safety	Report: 314885-A2	UL60601-1 1st Edition
	CSA Medical Safety	Report: 2207629	CAN/CSA-22.2 No 601.1-M90
	EN General Safety	Report: SPCLVD1310079-1	EN60950-1 : 2006
	CB/EN Medical Safety	Report: CA-10169-A1-UL	IEC/EN 60601-1 3rd Edition
	ANSI/AAMI Medical Safety	Report: E314885-A5	ES60601-1 3rd Edition

Notes

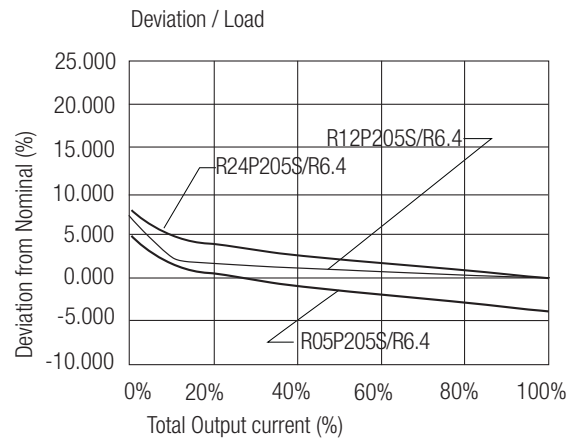
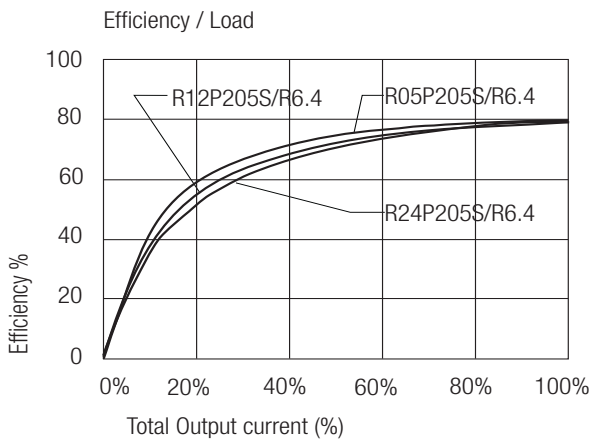
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

**Tolerance Envelope**

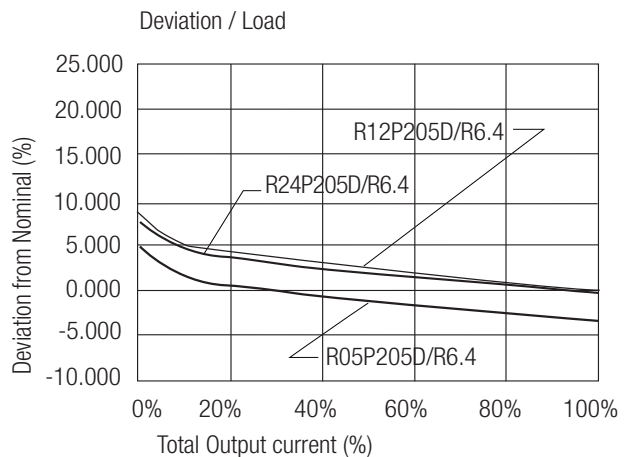
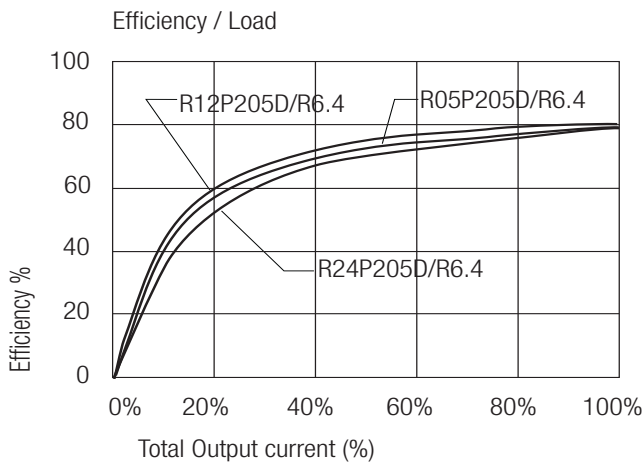


### Typical Characteristics

## RxxP205S/R6.4 RxxP205S/R8

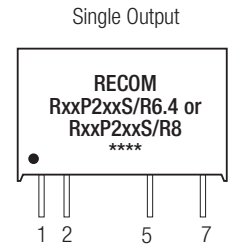
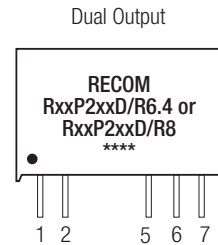
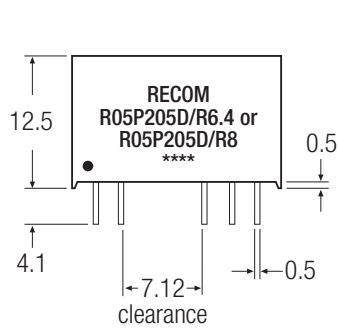


## RxxP205D/R6.4 RxxP205D/R8

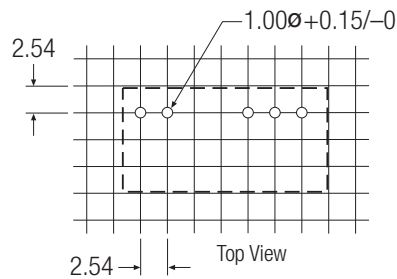
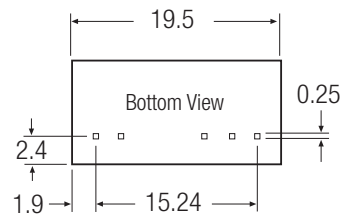


### Package Style and Pinning (mm)

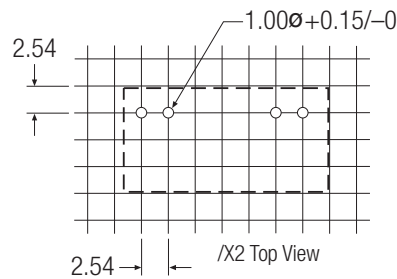
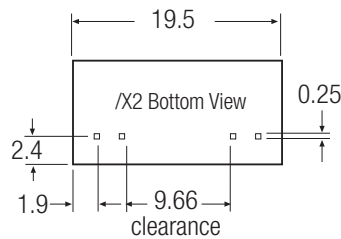
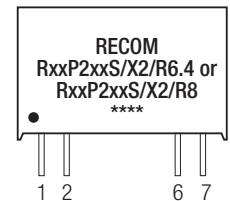
7 PIN SIP Package



Recommended Footprint Details



/X2 Single Output



#### 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