

## 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
- Suitable for IGBT Applications
- 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 <sup>(1)</sup>
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
RxxP21509D*	5, 12, 24	+15/-9	+67/-111	70-82	±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 (10% to 100% full load)	3.3, 5V output types 15% max. other output types, RxxP21509D 10% max.
Output Ripple and Noise (20MHz BW)	200mVp-p max.
Operating Frequency	20kHz min. / 50kHz typ. / 85kHz max. RxxP21509D 20kHz min. / 50kHz typ.
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

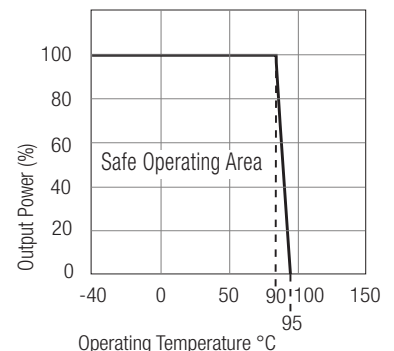


**EN-60950-1 Certified**  
**IEC/EN-60601-1 Certified\***  
**UL/CSA 60950-1 Certified\***  
 \* +15/-9 Version excluded

# RxxP2xx

## Derating-Graph

(Ambient Temperature)



Refer to Application Notes

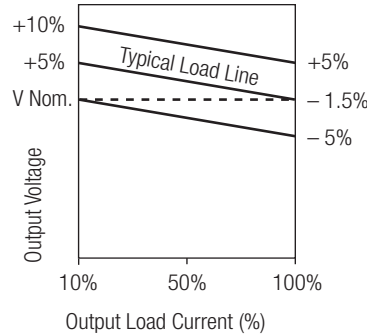
**Specifications** (measured at  $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

Operating Temperature Range (free air convection, 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 <sup>3</sup> hours
(+85°C)		Single/Dual using MIL-HDBK 217F	299/334 x 10 <sup>3</sup> hours
<b>Certifications</b>			
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**

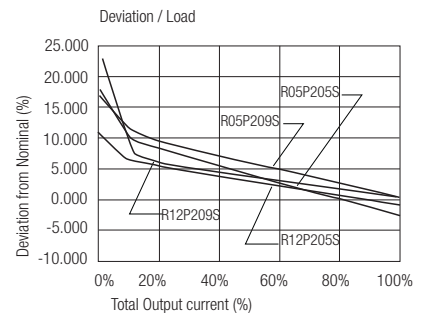
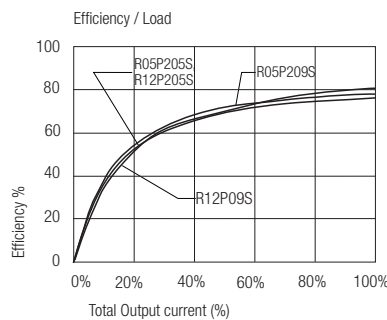
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

**Tolerance Envelope**

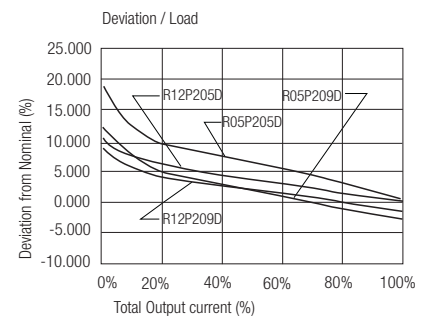
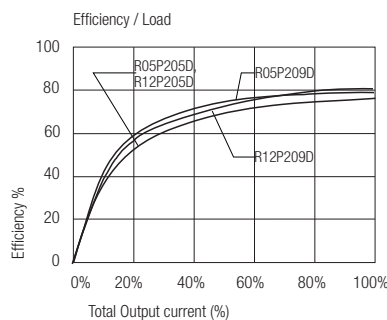


**Typical Characteristics**

**RxxP205S**  
**RxxP209S**

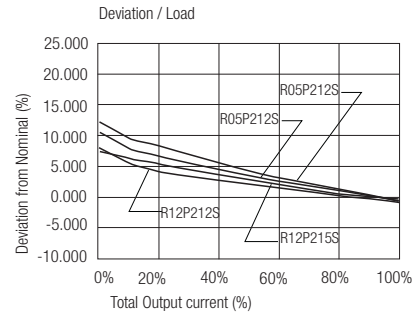
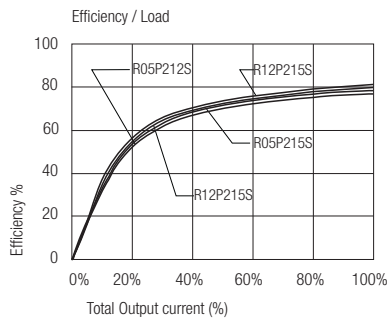


**R05P205D**  
**R05P209D**

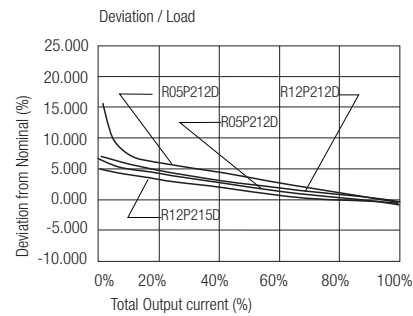
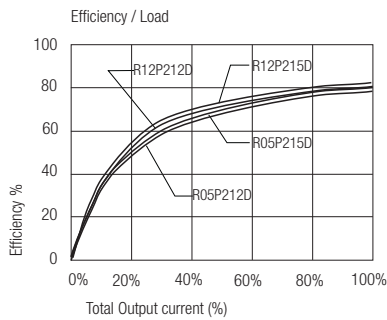


Typical Characteristics

## RxxP212S RxxP215S



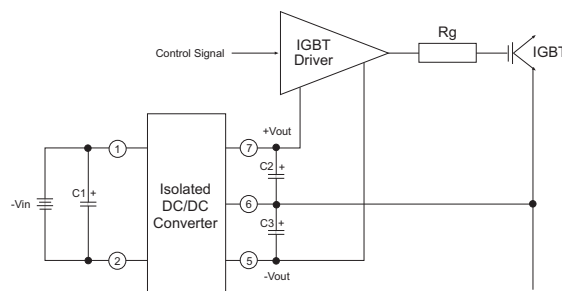
## RxxP212D RxxP215D



RxxP2xx

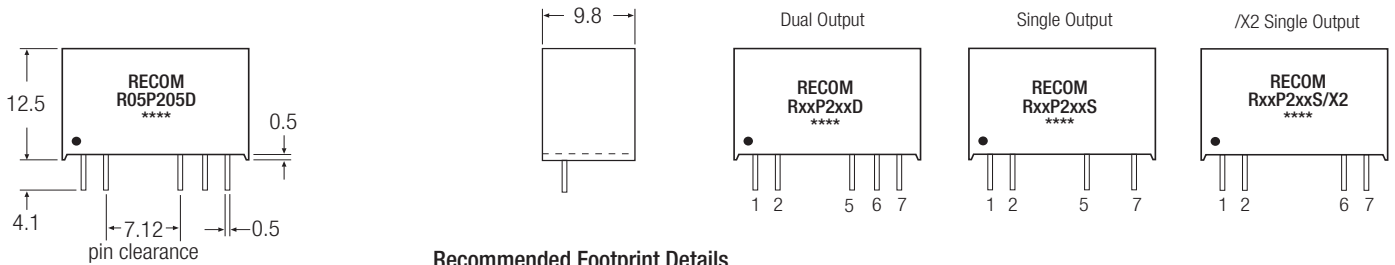
Application

### IGBT Application Circuit

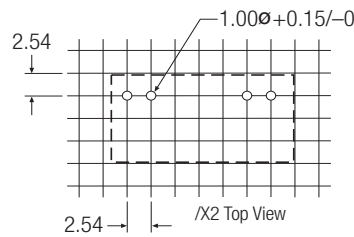
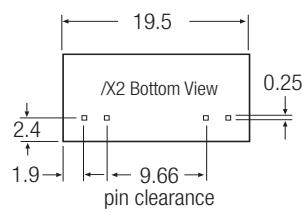
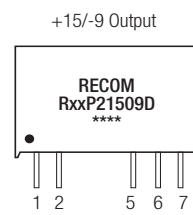
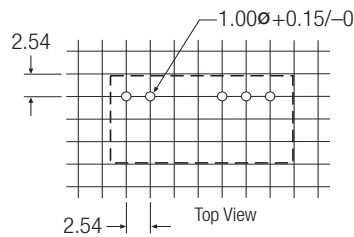
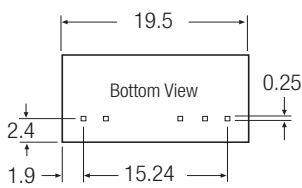


### Package Style and Pinning (mm)

#### 7 PIN SIP Package



#### 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