

## Features

## Unregulated Converters

- UL/CSA and EN Safety certified
- EN-60601 for Medical Applications
- Isolation 6.4kVDC
- Optional Continuous Short Circuit Protected
- /X2 Option for >9mm Input/Output Clearance
- Suitable for IGBT Applications

### Description

The RxxPxxS\_D Series of DC/DC Converters are certified to UL/CSA-60950 as well as EN60950 and EN60601. This makes them ideal for medical and safety applications where approved isolation is required.

### Selection Guide

Part Number SIP 7	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency Std (%)	Max Capacitive Load <sup>(1)</sup>
RxxP3.3S*	5, 9, 12, 15, 24	3.3	303	70	2200µF
RxxP05S*	5, 9, 12, 15, 24	5	200	70-75	1000µF
RxxP09S*	5, 9, 12, 15, 24	9	111	70-75	1000µF
RxxP12S*	5, 9, 12, 15, 24	12	84	70-75	470µF
RxxP15S*	5, 9, 12, 15, 24	15	66	75-80	470µF
RxxP3.3D*	5, 9, 12, 15, 24	±3.3	±151	70	±1000µF
RxxP05D*	5, 9, 12, 15, 24	±5	±100	70-75	±470µF
RxxP09D*	5, 9, 12, 15, 24	±9	±55	70-75	±470µF
RxxP12D*	5, 9, 12, 15, 24	±12	±41	70-75	±220µF
RxxP15D*	5, 9, 12, 15, 24	±15	±33	75-80	±220µF
RxxP1509D*	12, 24	+15/-9	+33/-56	70-80	±220µF
R05P1509D*	5	+15/-9	±42	70-80	+68µF/-220µF

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

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. R05P05S/P, R05P05D/P

\* add Suffix "/X2" for single output with alternative pinout, e.g. R05P05S/X2, R05P05S/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, RxxP1509D 10% max.
Output Ripple and Noise (20MHz BW)	200mVp-p max.
Operating Frequency	20kHz min. / 50kHz typ. / 85kHz max. RxxP1509D 20kHz min. / 60kHz typ.
Efficiency at Full Load	65% min. / 75% typ.
Minimum Load = 0%	Specifications valid for 10% minimum load only
Isolation Voltages	(tested for 1 second) 6400VDC (rated for 1 minute**) 3200VAC / 60Hz
Isolation Capacitance	4pF min. / 10pF max.
Isolation Resistance	15 GΩ min.
Short Circuit Protection	1 Second
P-Suffix	Continuous
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

continued on next page

## ECONOLINE

### DC/DC-Converter

with 3 year Warranty

# RECOM

## 1 Watt

## SIP 7 Single

## & Dual Output



RoHS  
2011/65/EU  
6/6

E-358085

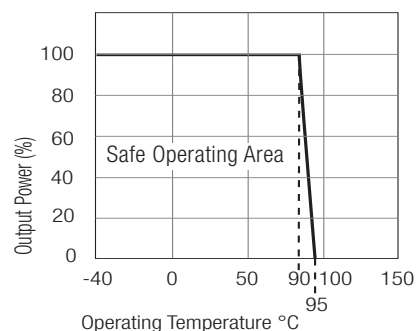


**EN-60950-1 Certified**  
**IEC/EN-60601-1 Certified\***  
**CSA/UL-60950-1 Certified\***  
**\* +15/-9 Version excluded**

## RxxPxx

## Derating-Graph

(Ambient Temperature)



\*\*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.



[www.recom-power.com/eval-ref-boards](http://www.recom-power.com/eval-ref-boards)

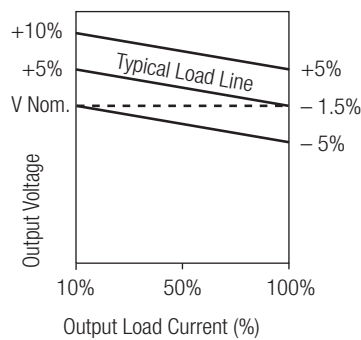
**Specifications** (measured at  $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

Package Weight			4.3g
Packing Quantity			25 pcs per Tube
MTBF (+25°C) } (+85°C) }	Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	2974 x 10 <sup>3</sup> hours
		using MIL-HDBK 217F	728 x 10 <sup>3</sup> 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.

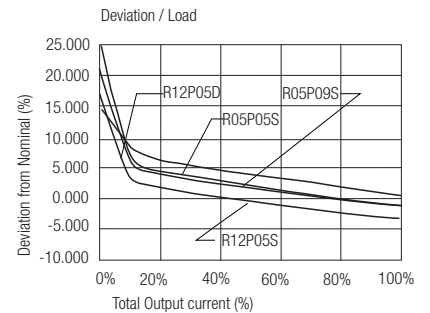
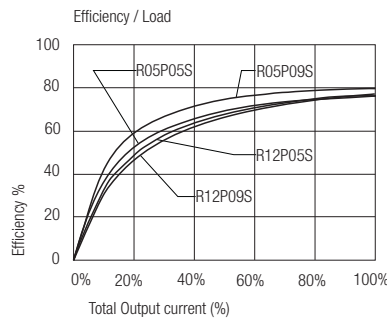
**Tolerance Envelope**



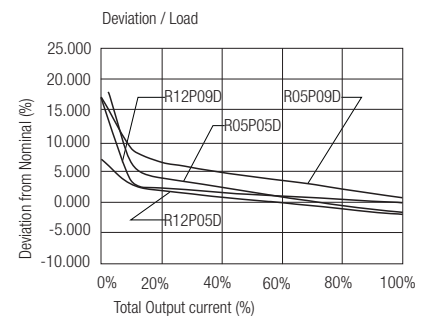
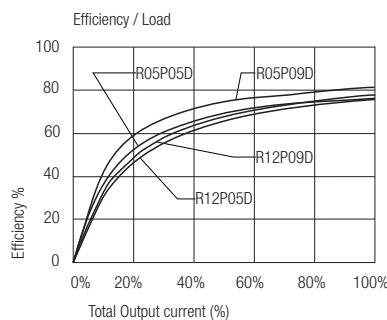
**Typical Characteristics**

RxxPxx

**RxxP05S**  
**RxxP09S**

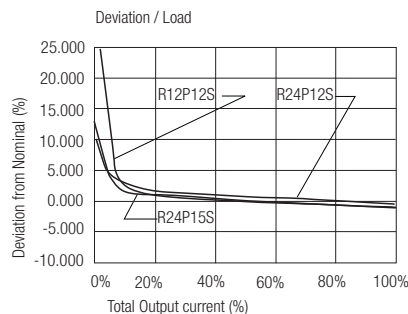
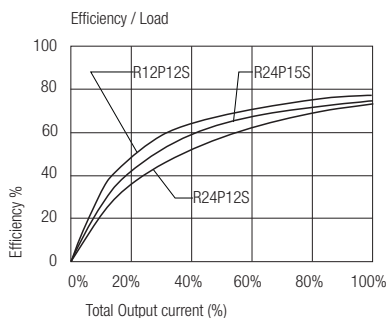


**RxxP05D**  
**RxxP09D**

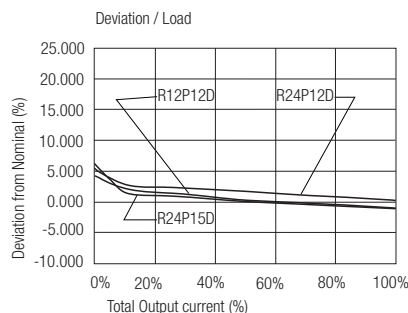
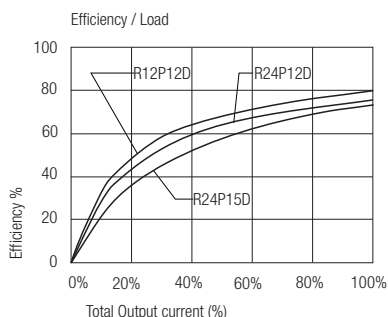


Typical Characteristics

## RxxP12S, RxxP15S

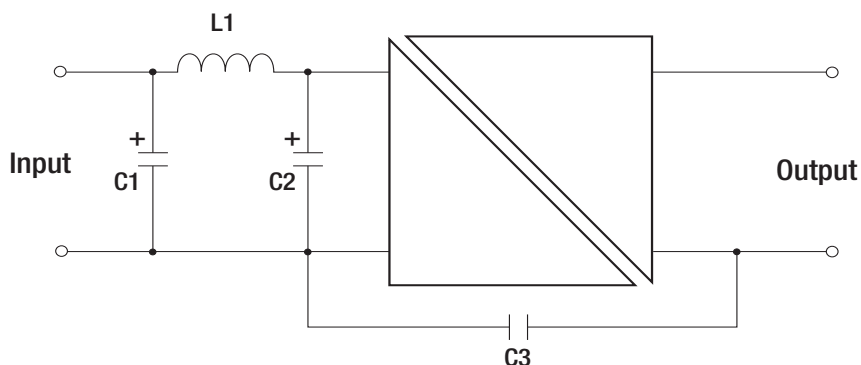


## RxxP12D, RxxP15D



RxxPxx

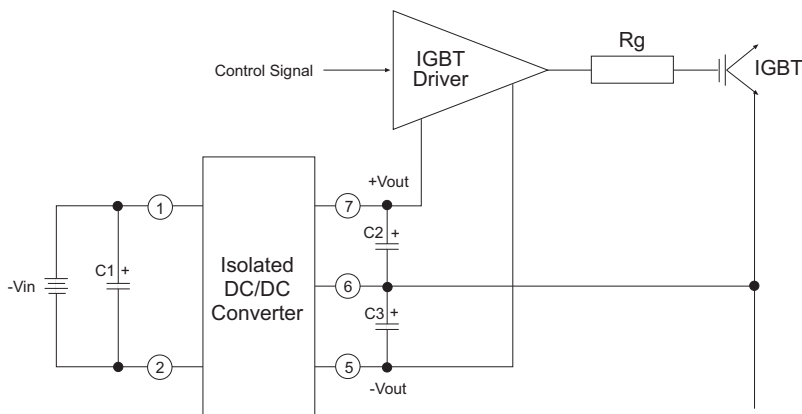
EMC Filter Suggestions for EN55022 Class A and B



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

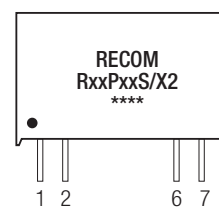
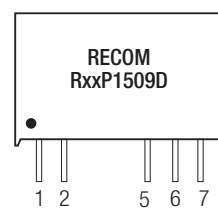
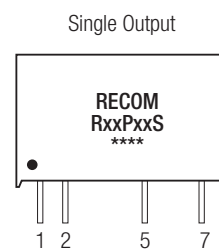
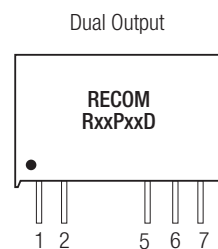
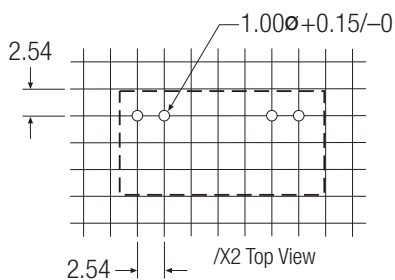
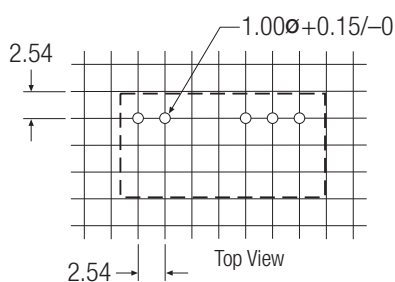
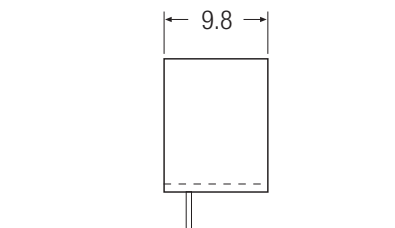
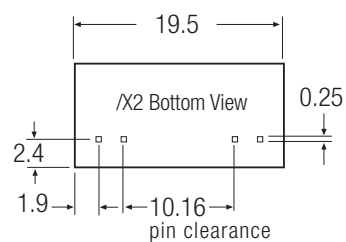
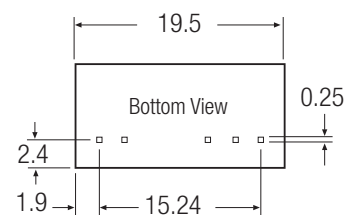
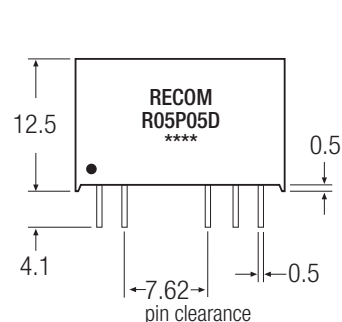
Application

## IGBT Application Circuit



Package Style and Pinning (mm)

7 PIN SIP Package



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

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