

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 ⁽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
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	3.3, 5V output types 15% max.
(10% to 100% full load)	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

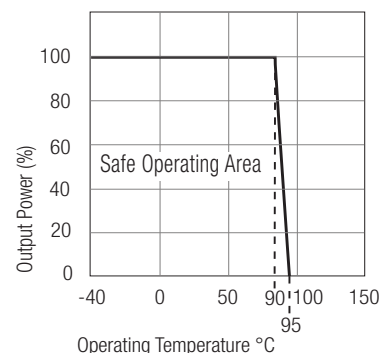
SIP 7 Single & Dual Output



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

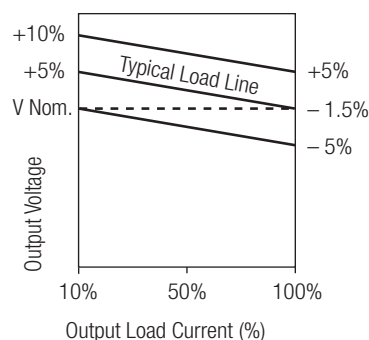
Specifications (measured at $T_A = 25^\circ\text{C}$, nominal input voltage, full load and after warm-up)

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 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

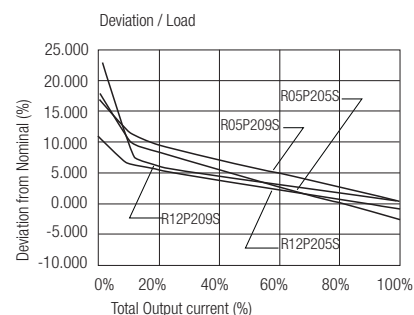
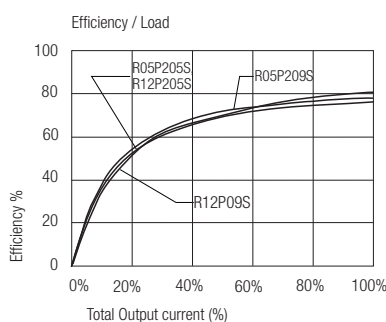
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

Tolerance Envelope

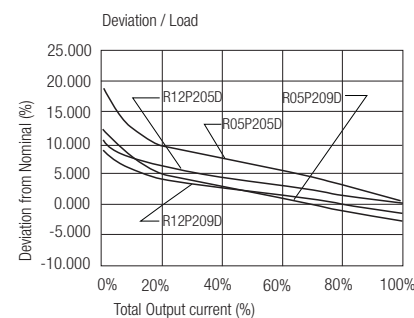
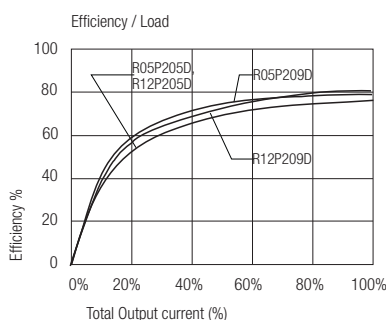


Typical Characteristics

RxxP205S
RxxP209S

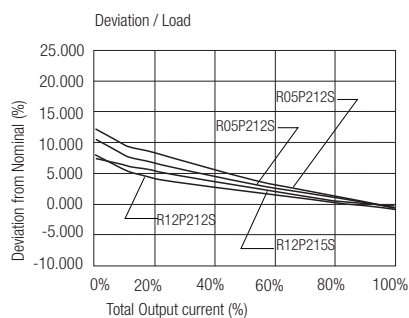
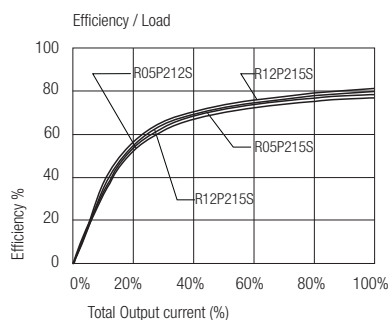


R05P205D
R05P209D

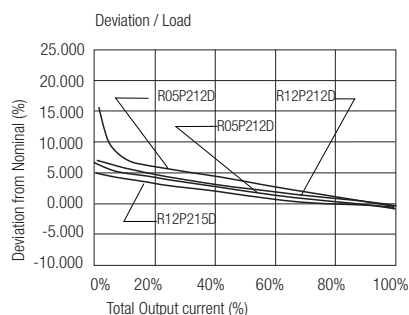
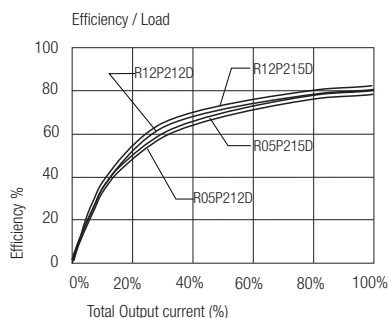


Typical Characteristics

RxxP212S RxxP215S

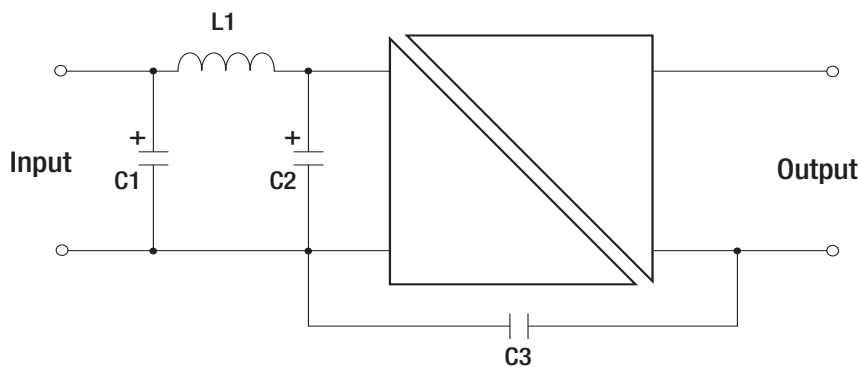


RxxP212D RxxP215D



RxxP2xx

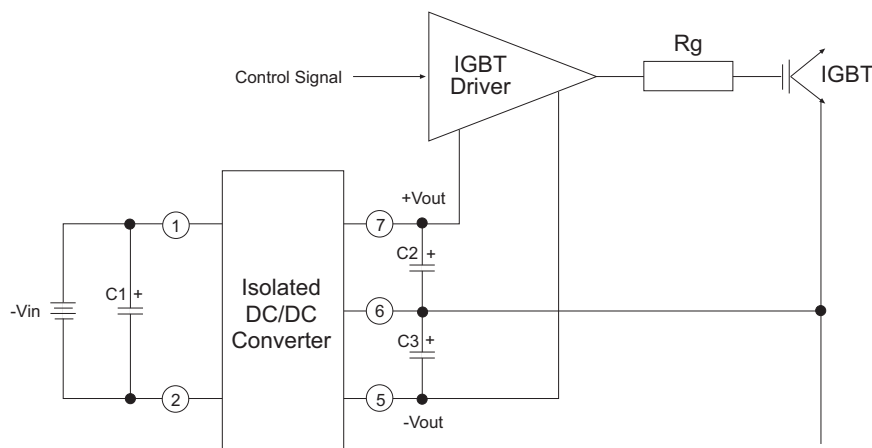
EMC Filter Suggestions for EN55022 Class A and B



	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

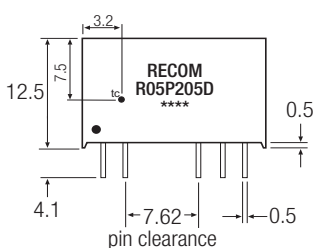
Application

IGBT Application Circuit

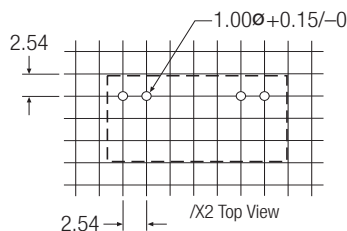
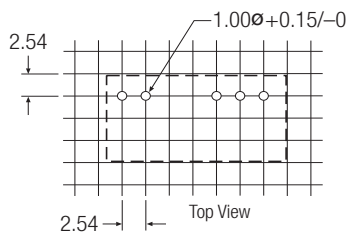
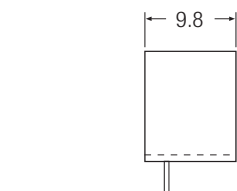
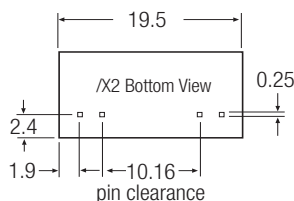
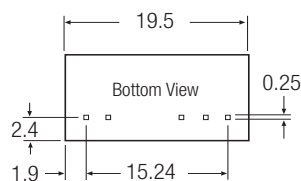


Package Style and Pinning (mm)

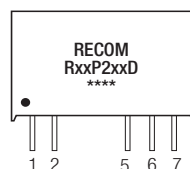
7 PIN SIP Package



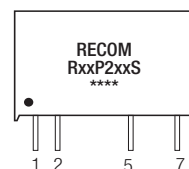
Recommended Footprint Details



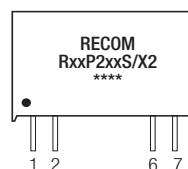
Dual Output



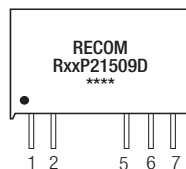
Single Output



/X2 Single Output



+15/-9 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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

RECOM:

[R05P205S](#) [R05P209S](#) [R12P212S](#) [R05P205D](#) [R05P205D/P](#) [R05P205S/P](#) [R05P209D](#) [R05P209D/P](#) [R05P209S/P](#)
[R05P212D](#) [R05P212D/P](#) [R05P212S](#) [R05P212S/P](#) [R05P215D](#) [R05P215D/P](#) [R05P215S](#) [R05P215S/P](#) [R05P23.3D](#)
[R05P23.3D/P](#) [R05P23.3S](#) [R05P23.3S/P](#) [R12P205D](#) [R12P205D/P](#) [R12P205S](#) [R12P205S/P](#) [R12P209D](#)
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[R12P215S/P](#) [R12P23.3D](#) [R12P23.3D/P](#) [R12P23.3S](#) [R12P23.3S/P](#) [R15P205D](#) [R15P205D/P](#) [R15P205S](#)
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[R24P205D](#) [R24P205D/P](#) [R24P205S](#) [R24P205S/P](#) [R24P209D](#) [R24P209D/P](#) [R24P209S](#) [R24P209S/P](#) [R24P212D](#)
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