## **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.

#### **Specifications** (measured at $T_A = 25$ °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, RxxP15090		509D 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 cor	-40°C to +90°C (see Graph)			
Storage Temperature Range -55°C to				
Relative Humidity		95% RH		

continued on next page

## **ECONOLINE**

DC/DC-Converter with 3 year Warranty



# 1 Watt SIP 7 Single & Dual Output









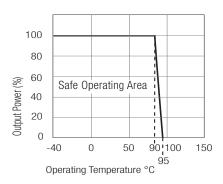
EN-60950-1 Certified IEC/EN-60601-1 Certified\* CSA/UL-60950-1 Certified\*

\* +15/-9 Version excluded

**RxxPxx** 

## **Derating-Graph**

(Ambient Temperature)



<sup>\*\*</sup>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.

**Refer to Application Notes** 

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

<sup>\*</sup> add Suffix "/X2" for single output with alternative pinout, e.g. R05P05S/X2, R05P05S/P/X2

## **ECONOLINE**

## DC/DC-Converter

# RxxPxxS\_D Series

## **Specifications** (measured at $T_A = 25$ °C, nominal input voltage, full load and after warm-up))

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

Certifications

 UL/cUL General Safety
 Report: E358085-A8
 UL 60950-1 2nd Ed.

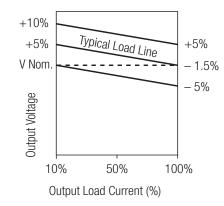
 EN General Safety
 Report: SPCLVD1305069
 EN60950-1:2006 + A12: 2011

 EN Medical Safety
 Report: SPCMDD1205098-4
 IEC/EN60601-1:2006, 3rd Edition

Notes

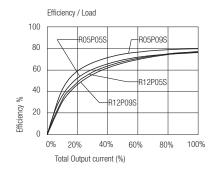
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

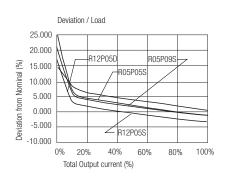
#### **Tolerance Envelope**



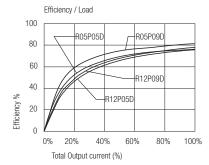
## **Typical Characteristics**

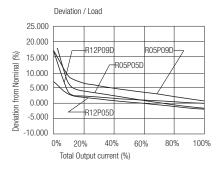
## RxxP05S RxxP09S





# RxxP05D RxxP09D





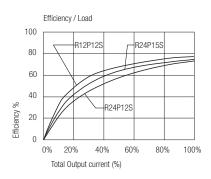
## **ECONOLINE**

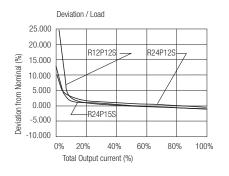
DC/DC-Converter

# RxxPxx5\_D Series

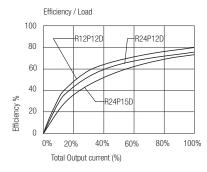
**Typical Characteristics** 

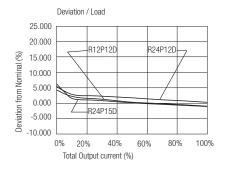
# RxxP12S RxxP15S





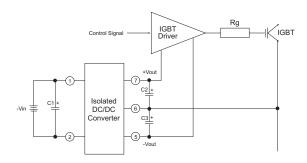
# RxxP12D RxxP15D





**Application** 

## IGBT Application Circuit



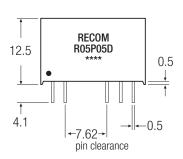
## **ECONOLINE**

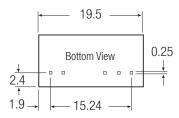
## DC/DC-Converter

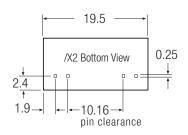
# RxxPxx5\_D Series

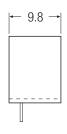
## Package Style and Pinning (mm)

#### 7 PIN SIP Package

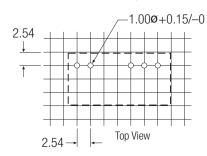


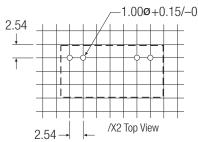


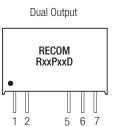


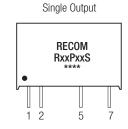


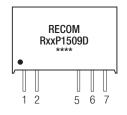
#### **Recommended Footprint Details**

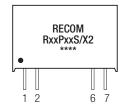












#### Pin Connections

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

 $\begin{array}{ccc} \text{XX.X} & \pm \ 0.5 \ \text{mm} \\ \text{XX.XX} & \pm \ 0.25 \ \text{mm} \end{array}$ 

## **Mouser Electronics**

**Authorized Distributor** 

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## RECOM:

R05P05S R05P12S R12P12S R24P05S R24P12S R09P09S/P/X2/R6.4 R09P09S/P/X2/R8 R09P12S/P/X2/R8 R05P12S/P/X2/R6.4 R05P12S/P/X2/R8 R09P15S/P/X2/R6.4 R09P15S/P/X2/R8 R09P3.3S/P/X2/R6.4 R09P3.3S/P/X2/R8 R12P05S/P/X2/R6.4 R12P05S/P/X2/R8 R12P09S/P/X2/R6.4 R12P09S/P/X2/R8 R05P05S/P/X2/R6.4 R05P05S/P/X2/R8 R05P09S/P/X2/R6.4 R05P09S/P/X2/R8 R12P12S/P/X2/R6.4 R12P12S/P/X2/R8 R12P15S/P/X2/R6.4 R12P15S/P/X2/R8 R15P05S/P/X2/R8 R15P09S/P/X2/R6.4 R15P09S/P/X2/R8 R15P12S/P/X2/R6.4 R15P12S/P/X2/R8 R15P15S/P/X2/R6.4 R15P15S/P/X2/R8 R15P3.3S/P/X2/R6.4 R15P3.3S/P/X2/R8 R24P05S/P/X2/R6.4 R24P05S/P/X2/R8 R24P09S/P/X2/R8 R24P12S/P/X2/R6.4 R24P15S/P/X2/R6.4 R24P15S/P/X2/R8 R24P3.3S/P/X2/R6.4 R24P3.3S/P/X2/R8 R05P15S/P/X2/R6.4 R05P15S/P/X2/R8 R09P12S/P/X2/R6.4 R05P3.3S/P/X2/R6.4 R05P3.3S/P/X2/R8 R09P05S/P/X2/R6.4 R09P05S/P/X2/R8 R12P3.3S/P/X2/R8 R15P05S/P/X2/R6.4 R12P3.3S/P/X2/R6.4 R24P12S/P/X2/R8 R24P09S/P/X2/R6.4 R05P05D R05P05D/P R05P05D/P/R6.4 R05P05D/P/R8 R05P05D/R6.4 R05P05D/R8 R05P05S/P R05P05S/P/R6.4 R05P05S/P/R8 R05P05S/R6.4 R05P05S/R8 R05P05S/X2/R6.4 R05P05S/X2/R8 R05P09D R05P09D/P R05P09D/P/R6.4 R05P09D/P/R8 R05P09D/R6.4 R05P09D/R8 R05P09S R05P09S/P R05P09S/P/R6.4 R05P09S/P/R8 R05P09S/R6.4 R05P09S/R8 R05P09S/X2/R6.4 R05P09S/X2/R8 R05P12D R05P12D/P R05P12D/P/R6.4 R05P12D/P/R8 R05P12D/R6.4 R05P12D/R8 R05P12S/P R05P12S/P/R6.4 R05P12S/P/R8 R05P12S/R6.4 R05P12S/R8 R05P12S/X2/R6.4 R05P12S/X2/R8 R05P15D R05P15D/P R05P15D/P/R6.4 R05P15D/P/R8 R05P15D/R6.4