

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

Selection Guide

Part Number SIP 7	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency Std (%)	Max Capacitive Load ⁽¹⁾
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

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

No suffix is functional isolation e.g. R05P05S

* 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°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 (10% to 100% full load)	3.3, 5V output types other output types	15% max. 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. / 75% typ.
Minimum Load = 0%	Specifications valid for 10% minimum load only	
Isolation Voltages	(tested for 1 second) (rated for 1 minute)	6400VDC 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)		-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 cont.

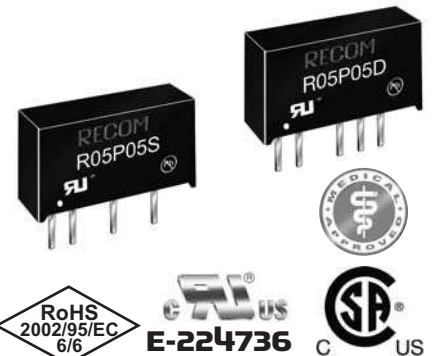
ECONOLINE

DC/DC-Converter

with 3 year Warranty

RECOM

1 Watt SIP 7 Single & Dual Output



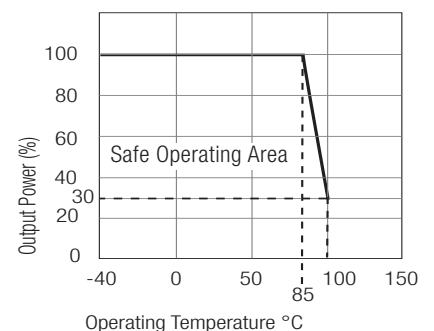
EN-60950-1 Certified
EN-60601-1 Certified
UL/CSA 60950-1 Certified*
IEC 60601-1 CB Report
*** +15/-9V Pending**

RxxPxx

Description

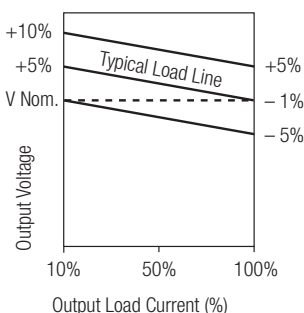
The RxxPxxS_D Series of DC/DC Converters are certified to UL/CSA-60950. This makes them ideal for medical and safety applications where approved isolation is required.

Derating-Graph (Ambient Temperature)



Refer to Application Notes

Tolerance Envelope



Specifications (continued)

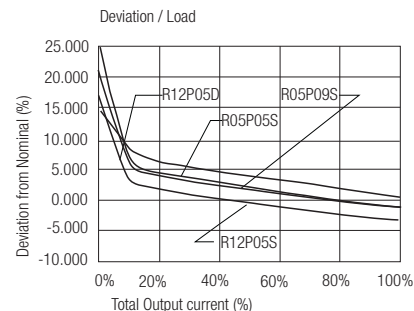
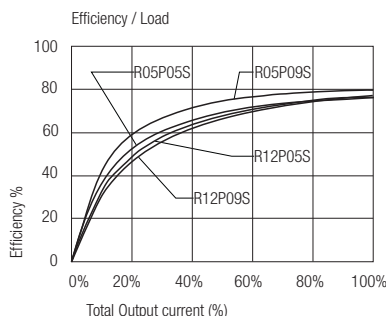
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	2974 x 10 ³ hours
(+85°C)		using MIL-HDBK 217F	728 x 10 ³ hours
Certifications	UL/cUL General Safety	Report: E248550	UL 60950-1 1st Ed.
	EN General Safety	Report: PS-R7219C1	EN60950-1:2001 + A11: 2004
	EN Medical Safety	Report: SPC1007090	EN60601-1:1990 + A13: 1996
	CB Report: Medical Safety	Report: SPC1007090	IEC60601-1:1988 + A1: 1991 + A2:1995

Notes

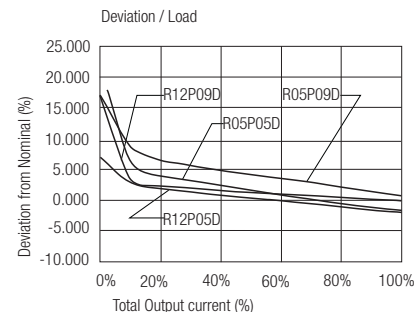
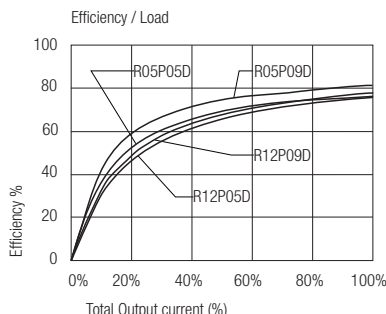
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

Typical Characteristics

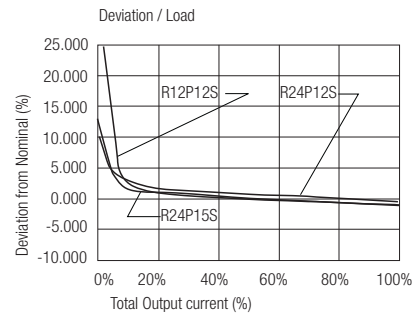
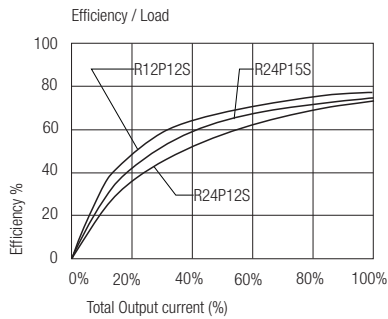
RxxP05/09S



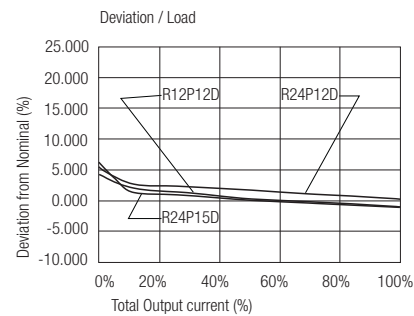
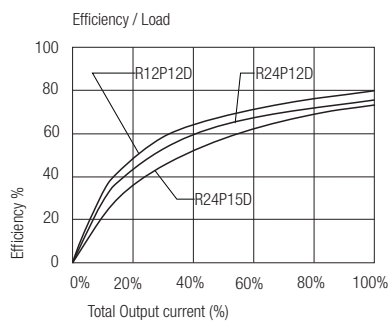
RxxP05/09D



RxxP12/15S

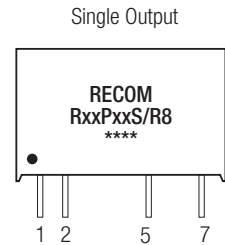
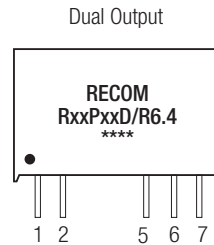
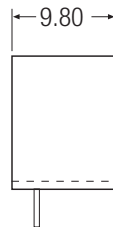
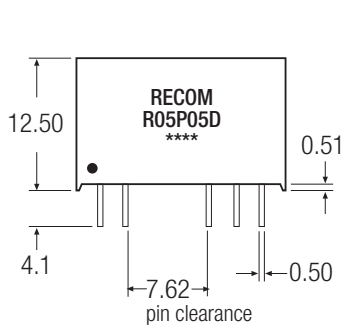


RxxP12/15D

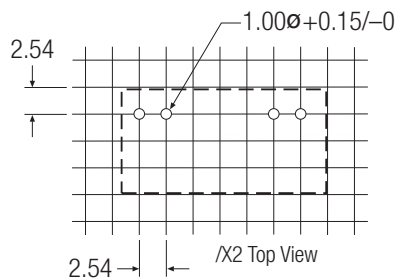
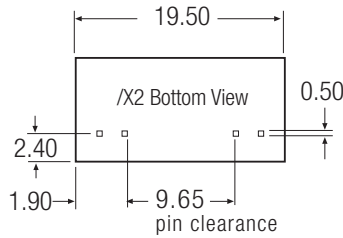
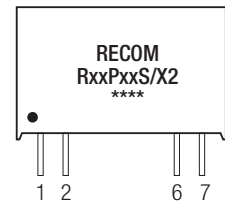
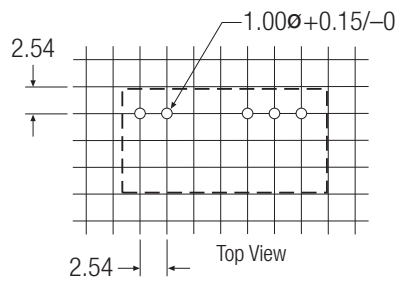
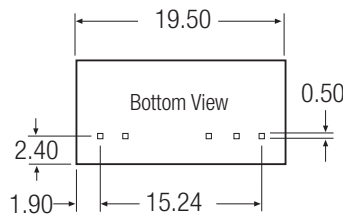


Package Style and Pinning (mm)

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

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
- Unique Reinforced Isolation Transformer System
- /X2 Option for >9mm Input/Output Clearance

Selection Guide

Part Number SIP 7	Reinforced Isolation (kVDC)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency Std (%)	Max Capacitive Load ⁽¹⁾
RxxP3.3S	/R6.4 & /R8	5, 9, 12, 15, 24	3.3	303	70~80	2200µF
RxxP05S	/R6.4 & /R8	5, 9, 12, 15, 24	5	200	75-80	1000µF
RxxP09S	/R6.4 & /R8	5, 9, 12, 15, 24	9	111	75-82	1000µF
RxxP12S	/R6.4 & /R8	5, 9, 12, 15, 24	12	84	75-82	470µF
RxxP15S	/R6.4 & /R8	5, 9, 12, 15, 24	15	66	75-83	470µF
RxxP3.3D	/R6.4 & /R8	5, 9, 12, 15, 24	±3.3	±151	72-79	±1000µF
RxxP05D	/R6.4 & /R8	5, 9, 12, 15, 24	±5	±100	75-82	±470µF
RxxP09D	/R6.4 & /R8	5, 9, 12, 15, 24	±9	±55	75-82	±470µF
RxxP12D	/R6.4 & /R8	5, 9, 12, 15, 24	±12	±41	75-82	±220µF
RxxP15D	/R6.4 & /R8	5, 9, 12, 15, 24	±15	±33	75-83	±220µF

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

No suffix is functional isolation e.g. R05P05S

* 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

* add Suffix "/R6.4" or "/R8" for Reinforced Isolation, e.g. R05P05D/R6.4, R05P05S/P/X2/R8

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 other output types	15% max. 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. / 75% typ.
Minimum Load = 0%	Specifications valid for 10% minimum load only.	
Reinforced Isolation /R6.4	(tested for 1 second) (rated for 1 minute)	6400VDC 3200VAC / 60Hz
Reinforced Isolation /R8	(tested for 1 second) (rated for 1 minute)	8000VDC 4000VAC / 60Hz
Isolation Capacitance		4pF min. / 10pF max.
Isolation Resistance		15 GΩ min.
Short Circuit Protection P-Suffix		1 Second Continuous
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 cont.

ECONOLINE

DC/DC-Converter

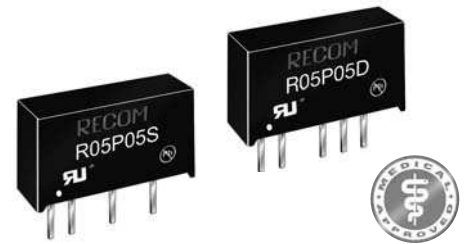
with 3 year Warranty

RECOM

1 Watt

SIP 7 Single

& Dual Output



EN-60950-1 Certified

EN-60601-1 Certified

UL/CSA 60950-1 Certified

U-60601-1 Certified

EN-61010-1 Certified

IEC-60601-1 CB Report

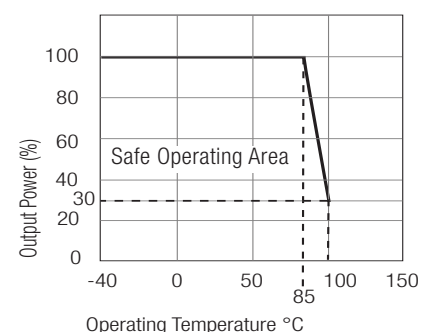
RxxPxx/R

Description

The RxxPxxS_D Series of DC/DC Converters are certified to UL/CSA-60950. This makes them ideal for safety applications where approved or reinforced isolation is required. The reinforced versions are also EN61010-1 certified for Lab Equipment Safety.

Derating-Graph

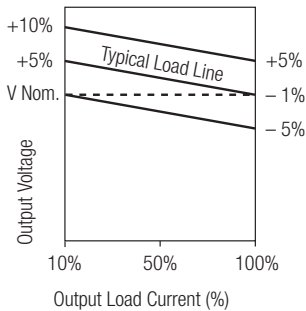
(Ambient Temperature)



Refer to Application Notes

Tolerance Envelope

Specifications (continued)



MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	2974 x 10 ³ hours
(+85°C)		using MIL-HDBK 217F	728 x 10 ³ hours
Reinforced Isolation			
Transformer Clearance	Reinforced Types	5.5 mm min.	
PCB Creepage & Clearance	Reinforced Types	4.8 mm min.	
Certifications	CB Report: Medical Safety	Ref: CA/11158/CSA	IEC60601-1:1988 + A1: 1991 + A2:1995
Measurement, Control and Laboratory Use Safety	CSA General Safety	Report: IL091212010M1	EN 61010-1 : 2001
			UL 60950-1 1st Ed.
			C22.2 No. 60950-1-03
	UL/cUL Medical Safety	Report: E314885-A2-UL	UL60601-1 1st Edition
	CSA Medical Safety	Report: 2207629	CAN/CSA-22.2 No 601.1-M90
	EN General Safety	Report: PS-R7219C1	EN60950-1:2001 + A11: 2004
	EN Medical Safety	Report: PS090301601	EN60601-1:1990 + A13: 1996

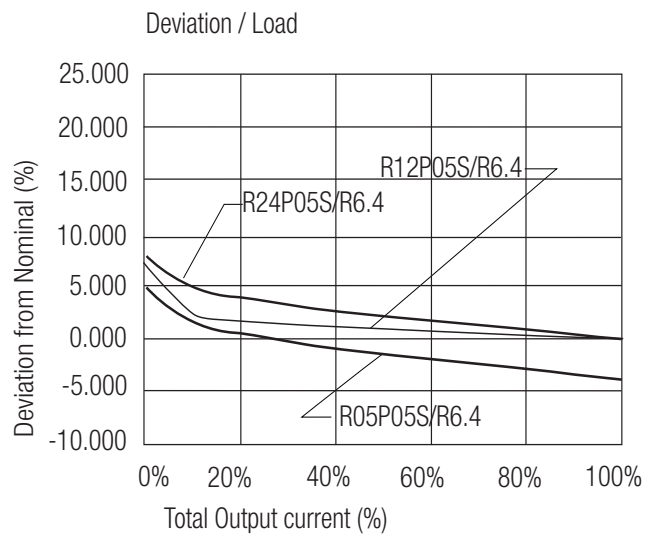
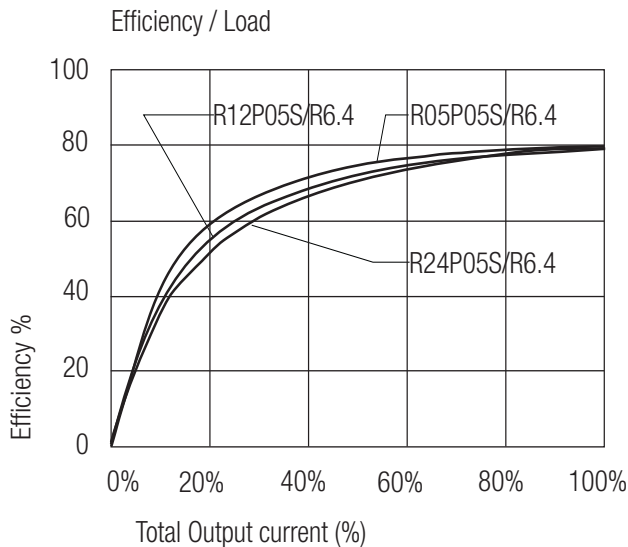
Notes

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.

Typical Characteristics - Reinforced Version

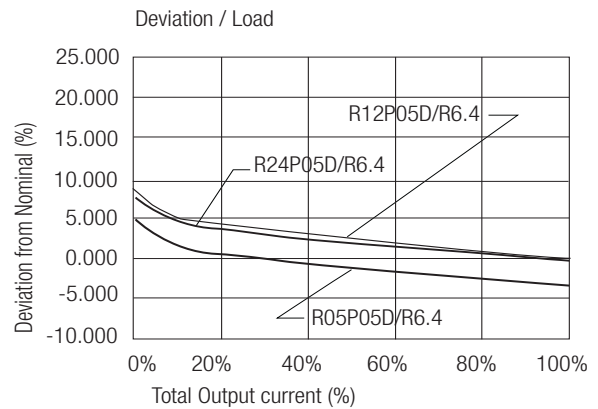
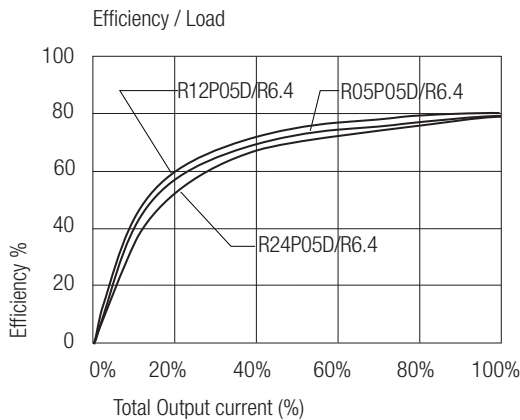
RxxP05S/R6.4
RxxP05S/R8

RxxPxx/R



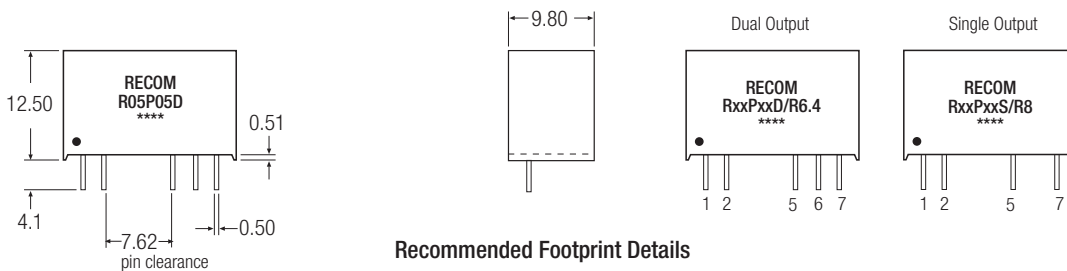
Typical Characteristics - Reinforced Version

RxxP05D/R6.4 RxxP05D/R8

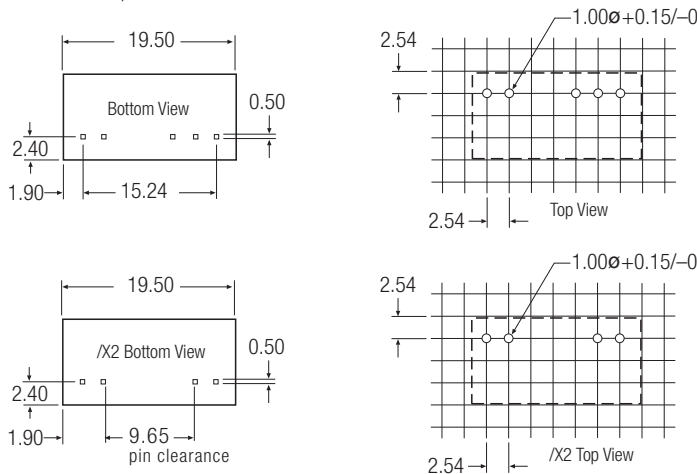


Package Style and Pinning (mm)

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