Features

Unregulated Converters

- Qualified with 65kV/µs @ Vcommon mode =1KV
- EN61010 for test, measurement and lab use
- EN60601 for medical applications
- Reinforced isolation 6.4kVDC or 8kVDC
- Optional continuous short circuit protection
- Unique reinforced isolation transformer system
- /X2 option for >9mm input/output clearance

RECOM
DC/DC Converter

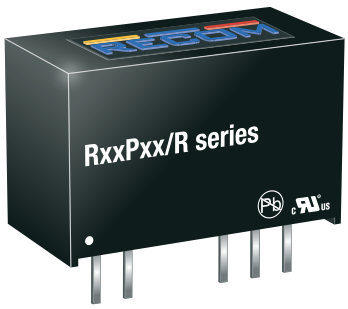
RxxPxx/R

1 Watt SIP7 Single and Dual Output

3 YEAR warranty

Description

The RxxPxxS_D Series of DC/DC Converters are certified to UL/CSA60950-1. 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.



Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
RxxP3.3S/R(3,4,5)	5, 12, 15, 24	3.3	303	70 - 80	2200
RxxP05S/R(3,4,5)	5, 12, 15, 24	5	200	75 - 80	1000
RxxP09S/R(3,4,5)	5, 12, 15, 24	9	111	75 - 82	1000
RxxP12S/R(3,4,5)	5, 12, 15, 24	12	84	75 - 82	470
RxxP15S/R(3,4,5)	5, 12, 15, 24	15	66	75 - 83	470
RxxP3.3D/R(3,4,5)	5, 12, 15, 24	±3.3	±151	72 - 79	±1000
RxxP05D/R(3,4,5)	5, 12, 15, 24	±5	±100	75 - 82	±470
RxxP09D/R(3,4,5)	5, 12, 15, 24	±9	±55	75 - 82	±470
RxxP12D/R(3,4,5)	5, 12, 15, 24	±12	±41	75 - 82	±220
RxxP15D/R(3,4,5)	5, 12, 15, 24	±15	±33	75 - 83	±220

Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: Max. Capacitive Load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter

E314885

UL/CSA60950-1 certified
IEC/EN60950-1 certified
UL/ES/CSA60601-1 certified
IEC/EN60601-1 certified
IEC/EN61010-1 certified
CB report

Model Numbering

R__P__ /P/X2/R

- Input Voltage
- Output Voltage
- Single or Dual
- *"Reinforced Isolation (3)"*
- *"Pinout (4)"*
- *"Protection (5)"*

Notes:

Note3: add suffix „/R6.4“ for 6.4kVDC/1second isolation or „/R8“ for 8kVDC/1second isolation

Note4: add suffix „/X2“ for single output with alternative pinout

Note5: add suffix „/P“ for continous short circuit protection

Ordering Examples:

R05P3.3S/R8/P = 5V Input, 3.3V Output, Single Output, 8kVDC/1s isolation, Continous Short Circuit Protection
R24P05S/R6.4/P/X2 = 24V Input, 5V Output, Single Output, 6.4kVDC/1s isolation, Continous SCP, Alternative Pinout
R12P05D/R8/X2 = ±12V Input, ±5V Output, Dual Output, 8kVDC/1s isolation, Alternative Pinout

REF DESIGN available
www.recom-power.com/eval-ref-boards

dv/dt ADVISORY REPORT AVAILABLE
www.recom-power.com/bier

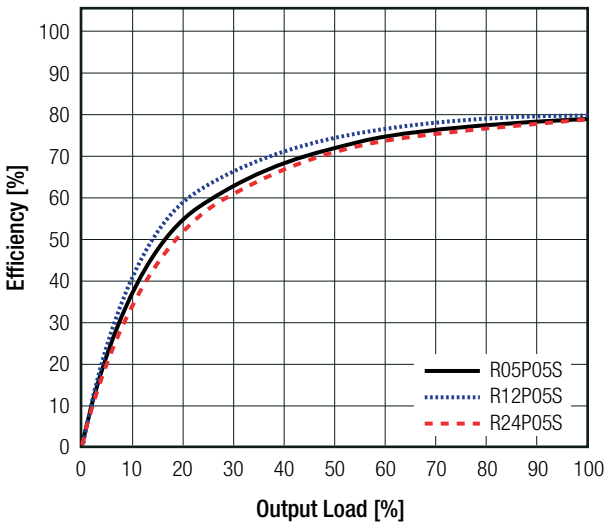
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

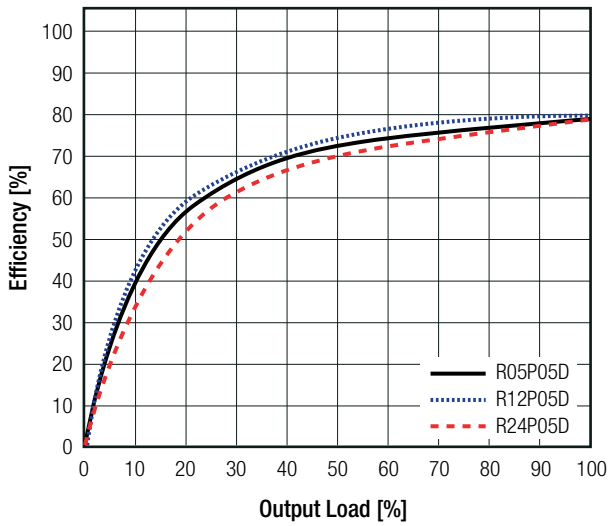
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load			0%	
Internal Operating Frequency		20kHz	50kHz	85kHz
Output Ripple and Noise	20MHz BW			200mVp-p

Efficiency vs. Load

RxxP05S/R6.4 and RxxP05S/R8



RxxP05D/R6.4 and RxxP05D/R8



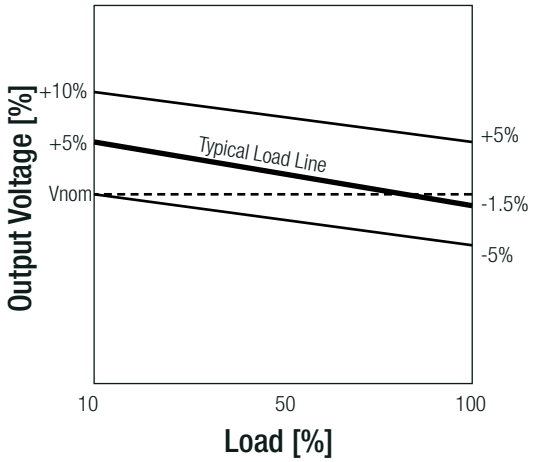
REGULATIONS

Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line, full load		1.2%/1% of Vin typ.
Load Regulation (6)	10% to 100% load	3.3Vout, 5Vout	15% typ.
		9Vout, 12Vout, 15Vout	10% typ.

Notes:

Note6: Operation below 10% load will not harm the converter, but specifications may not be met

Tolerance Envelope



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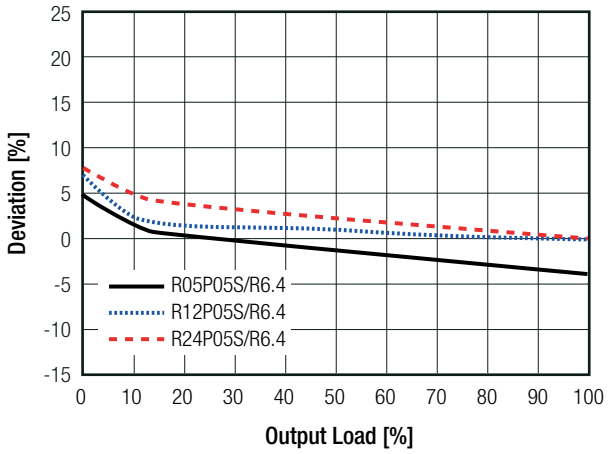
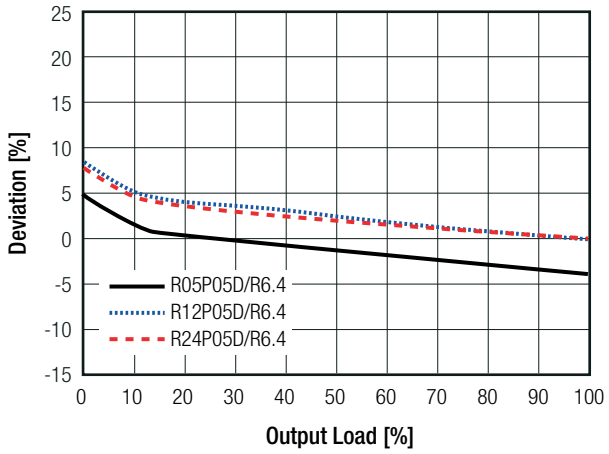
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Deviation vs. Load

RxxP05S/R6.4 and RxxP09S/R8



RxxP05D/R6.4 and RxxP09D/R8



PROTECTIONS

Parameter	Type			Value
Short Circuit Protection (SCP)	without Suffix "/P" with Suffix "/P"			1 second continuous
Isolation Voltage [7]	I/P to O/P	tested for 1 second	"/R6.4" "/R8"	6.4kVDC 8kVDC
		rated for 1 minute	"/R6.4" "/R8"	3.2kVAC/60Hz 4kVAC/60Hz
Isolation Resistance				15GΩ min.
Isolation Capacitance				4.0pF min. / 10pF max.
Leakage Current				<0.01µA max.
Insulation Grade				reinforced
Means of Protection	34Vrms			2MOPP
Internal	clearance/creepage			>4.8mm
External	clearance/creepage			>4.8mm

Notes:

Note7: For repeat Hi-Pot testing, reduce the time and/or the test voltage

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	without derating @ free air convection (see graph)		-40°C to +85°C
Maximum Case Temperature			+105°C
Operating Altitude			3000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +85°C	2974 x 10^3 hours 728 x 10^3 hours

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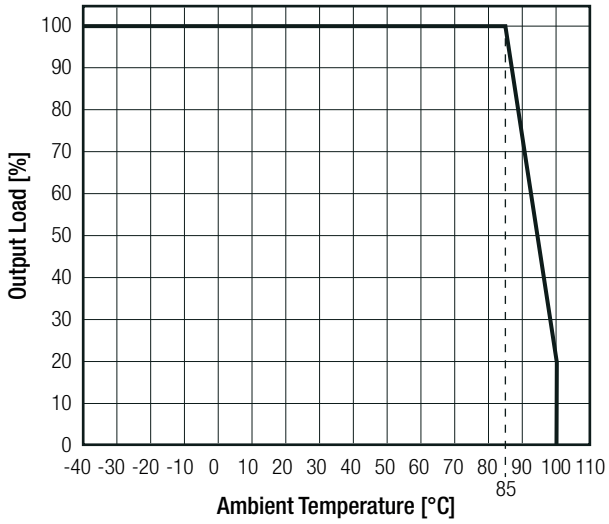
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Derating Graph

(@ Chamber and free air convection)



SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report / File Number**	**Standard**
Information Technology Equipment, General Requirements for Safety	LVD1605077-14	EN60950-1: 2006 + A2:2013 IEC60950-1-2005 , 2nd Edition + A2:2013
Information Technology Equipment, General Requirements for Safety	2236395	ANSI/UL60950-1, 1st Edition CAN/CSA-C22.2 No. 60950-1
Information Technology Equipment, General Requirements for Safety	2207629	ANSI/UL60950-1, 1st Edition CAN/CSA C22.2 No. 60950-1
Medical Electric Equipment, General Requirements for Safety and Essential Performance	2207629	UL60601-1, 1st Edition CAN/CSA-C22.2 No. 601.1-M90
Medical Electric Equipment, General Requirements for Safety and Essential Performance	E314885-A5-UL	ANSI/AAMI ES60601-1:2005 + A2:10 CAN/CSA-C22.2 No. 60601-1:2008
Medical Electric Equipment, General Requirements for Safety and Essential Performance. (CB Scheme)	E314885-A5-CB-1	IEC60601-1:2005 + C2:2007
Medical Electric Equipment, General Requirements for Safety and Essential Performance	WD-SE-R-180539-A0	EN60601-1:2006 + A12:2014 IEC60601-1:2005 + A1:2012, 3rd Edition
Safety requirements for electrical equipement for measurement, control and laboratory use	T1301251-313	EN61010:2010 IEC61010:2010, 3rd Edition
EAC	RU-AT.37.02367	TP TC 004/2011
RoHS 2		RoHS-2011/65/EU + AM-2015/863

EMC Compliance	**Condition**	**Standard / Criterion**
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter (refer to ***„EMC Filtering“)***	EN55032, Class A and B

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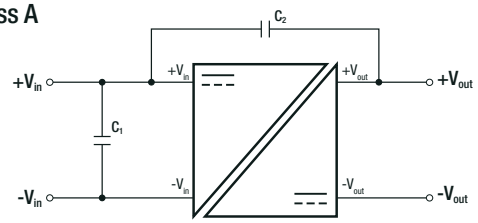
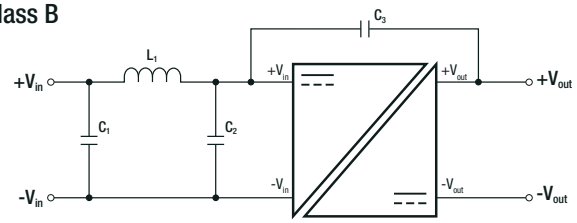
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

EMC Filtering Suggestion according to EN55032 Class A and Class B

Class A



Class B



Component List Class A

Model	C1	C2
RxxPxx/R6.4	10µF	2n2F 8kV
RxxPxx/R8	10µF	2n5F 10kV

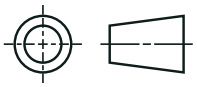
Component List Class B

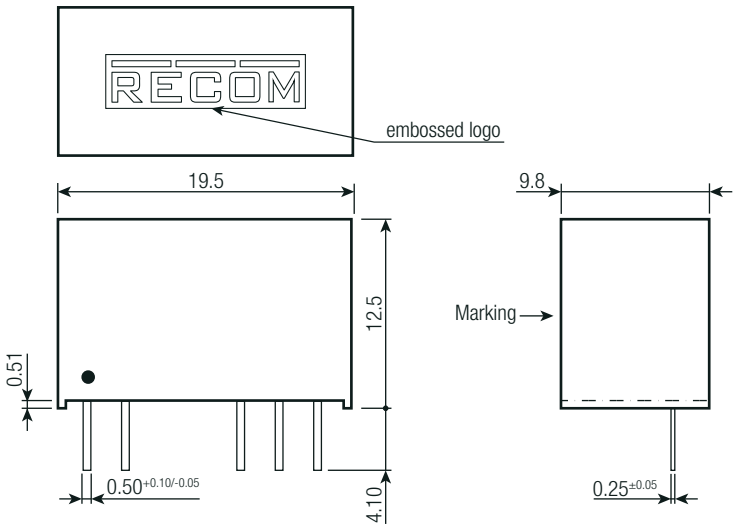
Model	C1	L1	C2	C3
RxxPxx/R6.4	10µF	470µH WE 7447471471	10µF	2n2F 8kV
RxxPxx/R8	10µF	470µH WE 7447471471	10µF	2n5F 10kV

DIMENSION AND PHYSICAL CHARACTERISTICS

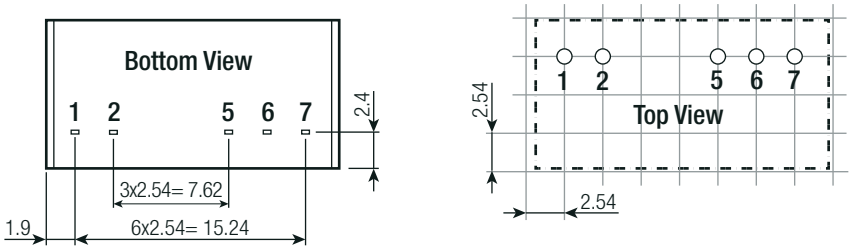
Parameter	Type	Value
Material	case potting PCB	non-conductive black plastic, (UL94 V-0) silicon rubber compound, (UL94 V-0) FR4, (UL94 V-0)
Dimension (LxWxH)		19.5 x 9.8 x 12.5mm
Weight		4.3g typ.

Dimension Drawing (mm)





Recommended Footprint Details



Pin Connection

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

Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube	520.0 x 22.3 x 12.0mm
Packaging Quantity	tube	25pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity		95% RH max.

Mouser Electronics

Authorized Distributor

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

RECOM:

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/P/R6.4 R05P05D/P/R8 R05P05D/R6.4 R05P05D/R8 R05P05S/P/R6.4 R05P05S/P/R8 R05P05S/R6.4 R05P05S/R8 R05P05S/X2/R6.4 R05P05S/X2/R8 R05P09D/P/R6.4 R05P09D/P/R8 R05P09D/R6.4 R05P09D/R8 R05P09S/P/R6.4 R05P09S/P/R8 R05P09S/R6.4 R05P09S/R8 R05P09S/X2/R6.4 R05P09S/X2/R8 R05P12D/P/R6.4 R05P12D/P/R8 R05P12D/R6.4 R05P12D/R8 R05P12S/P/R6.4 R05P12S/P/R8 R05P12S/R6.4 R05P12S/R8 R05P12S/X2/R6.4 R05P12S/X2/R8 R05P15D/P/R6.4 R05P15D/P/R8 R05P15D/R6.4 R05P15D/R8 R05P15S/P/R6.4 R05P15S/P/R8 R05P15S/R6.4 R05P15S/R8 R05P15S/X2/R6.4 R05P15S/X2/R8 R05P3.3D/P/R6.4 R05P3.3D/P/R8 R05P3.3D/R6.4 R05P3.3D/R8 R05P3.3S/P/R6.4 R05P3.3S/P/R8 R05P3.3S/R6.4 R05P3.3S/R8 R05P3.3S/X2/R6.4 R05P3.3S/X2/R8