Features

Unregulated Converters

- Qualified with 65kV/µs @ Vcommon mode =1KV
- UL/CSA and IEC/EN safety certified
- High isolation 6.4kVDC/1s
- Optional continuous short circuit protection
- /X2 version with >9mm input/output clearance
- Suitable for IGBT applications

RECOM
DC/DC Converter

RxxPxx

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 as well as EN60950-1. This makes them ideal for safety applications where approved isolation is required.

Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
RxxP3.3S (3,4)	5, 12, 15, 24	3.3	303	70	2200
RxxP05S (3,4)	5, 12, 15, 24	5	200	70 - 75	1000
RxxP09S (3,4)	5, 12, 15, 24	9	111	70 - 75	1000
RxxP12S (3,4)	5, 12,15, 24	12	84	70 - 75	470
RxxP15S (3,4)	5, 12, 15, 24	15	66	75 - 80	470
RxxP3.3D (3,4)	5, 12, 15, 24	±3.3	±151	70	±1000
RxxP05D (3,4)	5, 12, 15, 24	±5	±100	70 - 75	±470
RxxP09D (3,4)	5, 12, 15, 24	±9	±55	70 - 75	±470
RxxP12D (3,4)	5, 12,15, 24	±12	±41	70 - 75	±220
RxxP15D (3,4)	5, 12, 15, 24	±15	±33	75 - 80	±220
RxxP1509D (3,4)	12, 24	+15/-9	+33/-56	70 - 80	±220
R05P1509D (3,4)	5	+15/-9	±42	70 - 80	+68/-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

c UL us E224736

EN/IEC62368-1 certified
UL/CSA60950-1 certified
UL/CSA62368-1 certified

Model Numbering

R__P__ /P/X2

- Input Voltage
- Output Voltage
- Pinout (3)
- Protection (4)
- **S**ingle or **D**ual

Notes:

Note3: add suffix „/X2“ for single output with alternative pinout

Note4: add suffix „P“ for continous short circuit protection

Ordering Examples:

R05P05S/P = 5V Input, 5V Output, Single Output, Continous Short Circuit Protection
R05P3.3D/P = 5V Input, 3.3V Output, Dual Output, Continous Short Circuit Protection
R05P05S/P/X2 = 5V Input, 5V Output, Single Output, Continous Short Circuit Protection, Alternative Pinout

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

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

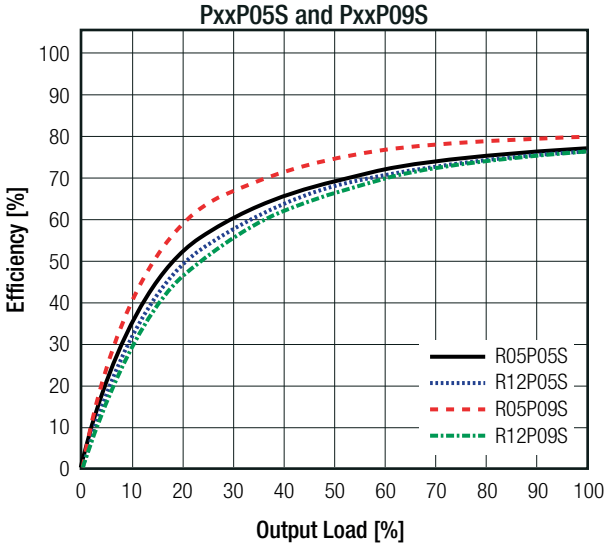
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

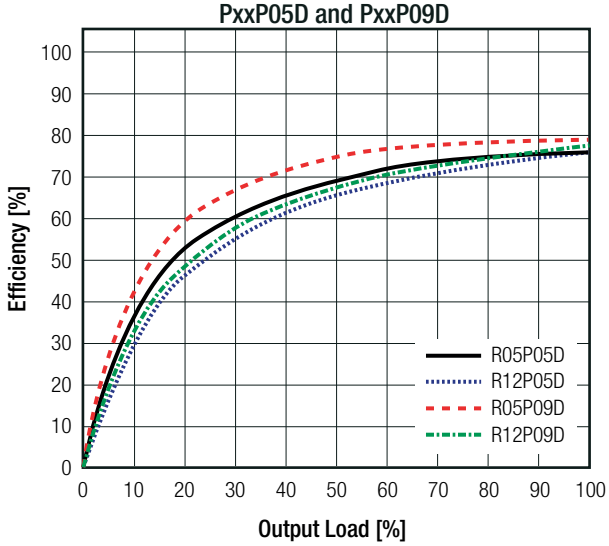
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load		0%		
Internal Operating Frequency	all types PxxP1509D	20kHz 20kHz	50kHz 60kHz	85kHz
Output Ripple and Noise	20MHz BW			200mVp-p

Efficiency vs. Load

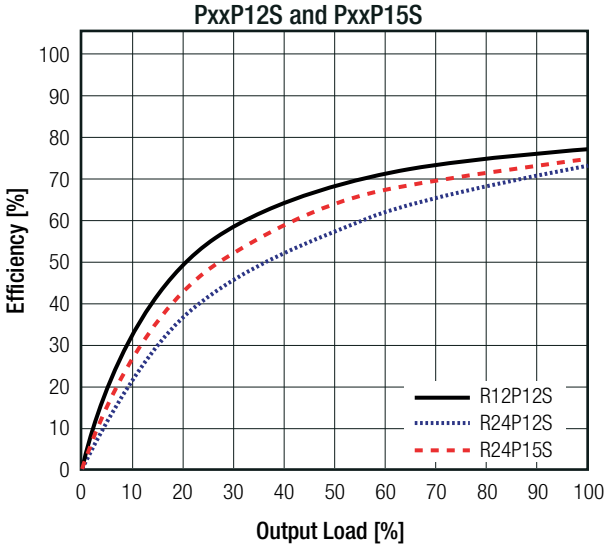
PxxP05S and PxxP09S



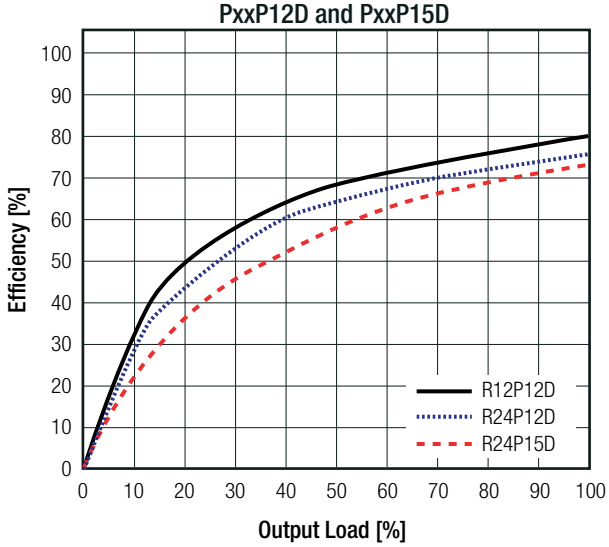
PxxP05D and PxxP09D



PxxP12S and PxxP15S



PxxP12D and PxxP15D



REGULATIONS

Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line, full load		±1.2% of 1.0% Vin typ.
Load Regulation [5]	10% to 100% load	3.3, 5VDC 9, 12, 15VDC	15% typ. 10% typ.

Notes:

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

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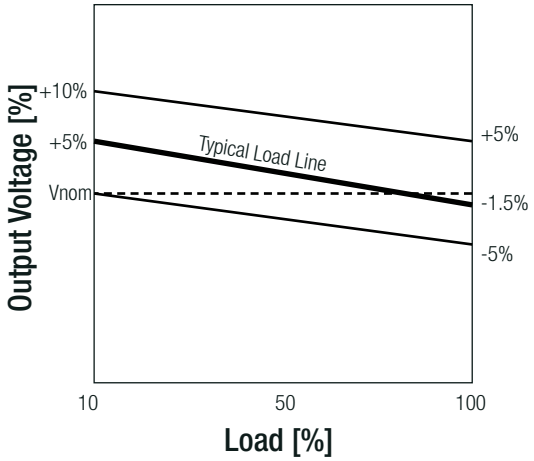
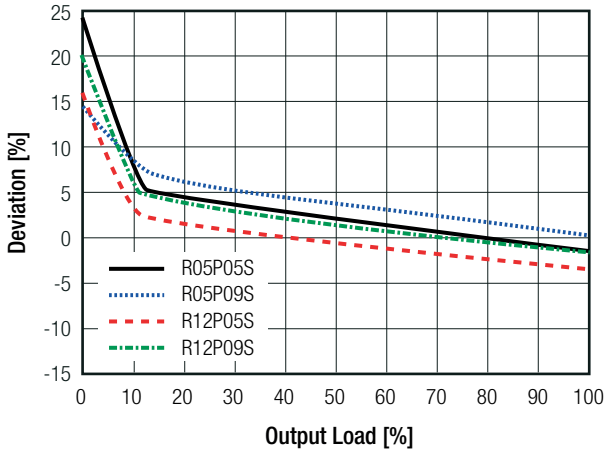
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Tolerance Envelope

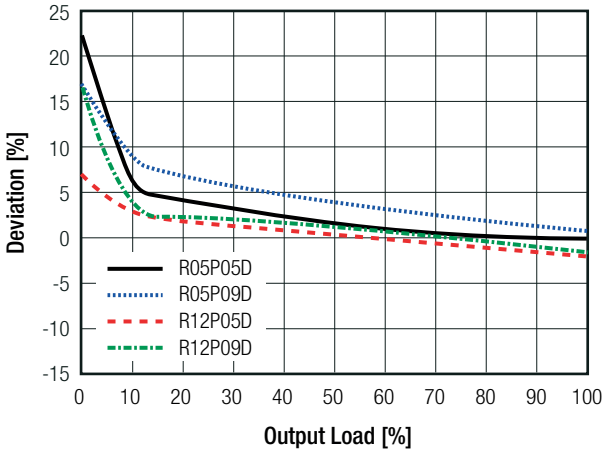


Deviation vs. Load

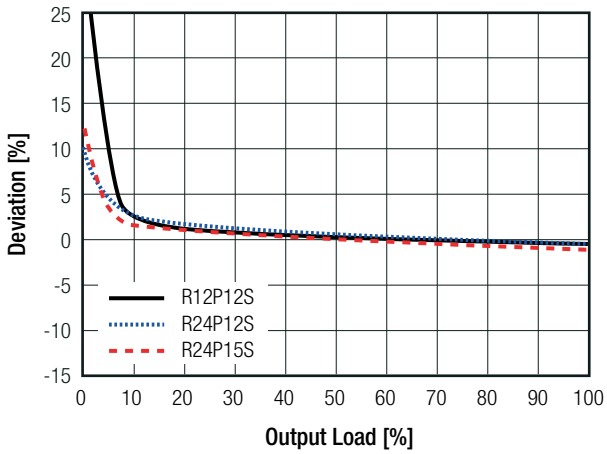
PxxP05S and PxxP09S



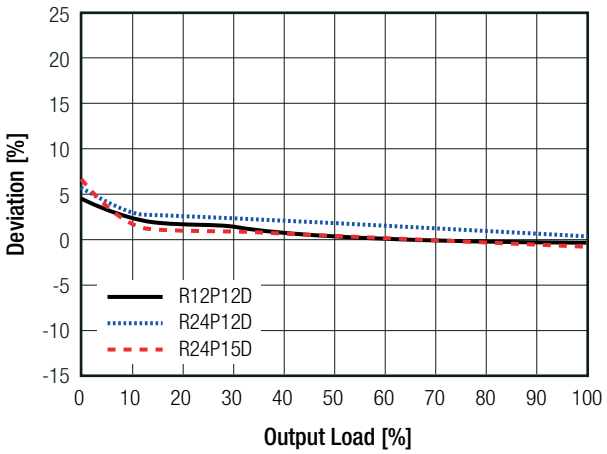
PxxP05D and PxxP09D



PxxP12S and PxxP15S



PxxP12D and PxxP15D



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

PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	without suffix with suffix "/P"		1 second continuous
Isolation Voltage [6]	I/P to O/P	tested for 1 second	6.4kVDC
		rated for 1 minute	3.2kVAC/60Hz
Isolation Resistance			15GΩ min.
Isolation Capacitance			4.0pF min. / 10pF max.
Insulation Grade			basic

Notes:

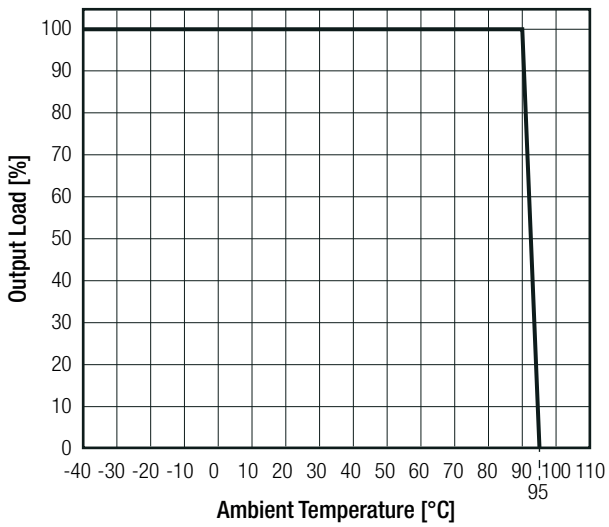
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note7: Refer to local safety regulations if input over-current protection is required. Recommended fuse: slow blow type

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	without derating @ free air convection(see graph)		-40°C to +90°C
Operating Altitude			2000m
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

Derating Graph
(@ Chamber and free air convection)



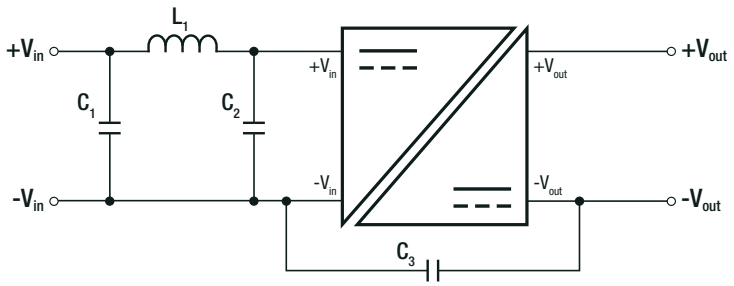
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E224736-A56-UL	UL60950-1, 2nd Edition, 2014 CAN/CSA C22.2 No. 60950-1, 2nd Edition, 2014
Information Technology Equipment, General Requirements for Safety	SPCLVD1602031	EN60950-1:2006 +AM:2013 IEC60950-1:2005, 2nd Edition +AM:2013
Audio/video, information and communication technology equipment. Safety requirements	E224736-A56-UL	UL62368-1, 2nd Edition, 2014 CAN/CSA C22.2 No. 62368-1, 2nd Edition, 2014
Audio/Video, information and communication technology equipment - Part1: Safety requirements (CB Scheme)	ATTCB106076	IEC62368-1:2014, 2nd Edition
Audio/Video, information and communication technology equipment - Part1: Safety requirements		EN62368-1: 2014 + A11:2017
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS 2+		RoHS-2011/65/EU + AM2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter (see filter suggestion below)	EN55032, Class B EN55032, Class A

EMC Filter Suggestion according to EN55032



Component List Class A

MODEL	C1	L1	C2	C3 (safety)
R05P05S	22µF 50V MLCC	N/A	N/A	N/A
R05P12S			N/A	
R12P05S	10µF 100V MLCC		4.7µF 50V MLCC	
R24P05S				

Component List Class B

MODEL	C1	L1	C2	C3 (safety)
R05P05S	10µF 100V MLCC	22µH choke RLS-226	N/A	1nF
R12P05S				
R24P05S				

Notes:

Note8: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact RECOM tech support for advice

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.

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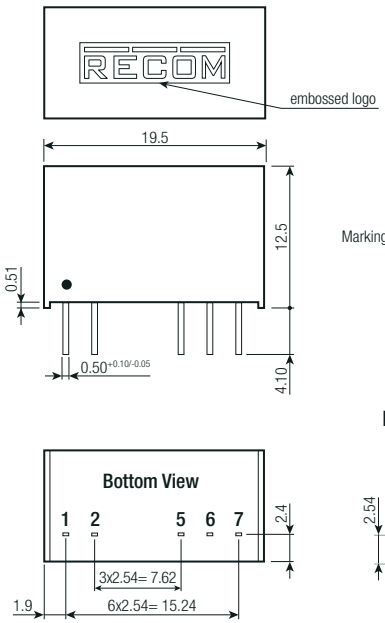
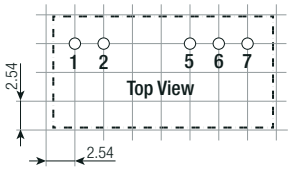
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)



Recommended Footprint Details



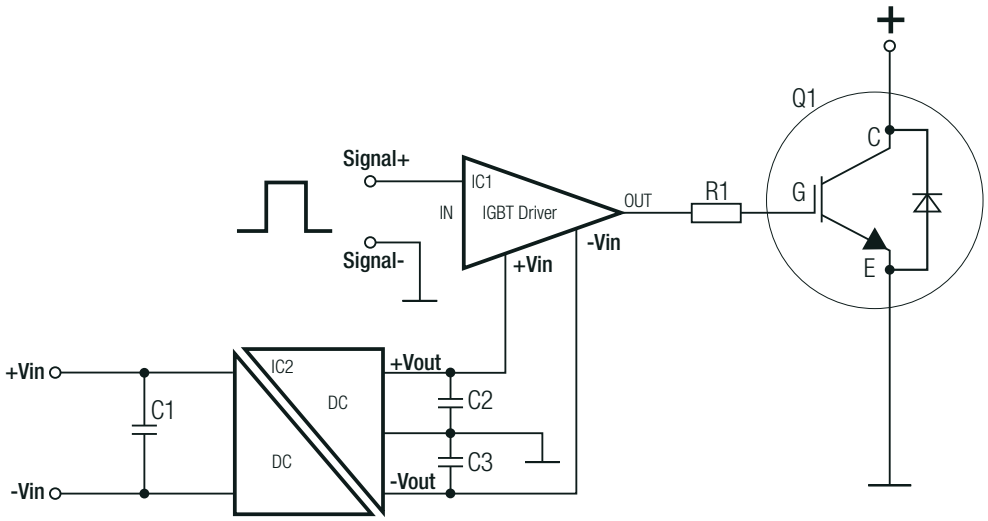
Pin Connection

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

INSTALLATION AND APPLICATION

IGBT Application Circuit



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.