

# Features

## Unregulated Converters

- UL/CSA and EN Safety certified
- EN-61010 for Test, Measurement and Lab. Use
- EN-60601 for Medical Applications
- Standard Isolation 5.2kVDC
- Optional Reinforced Isolation 6.4kVDC or 8kVDC
- Optional Continuous Short Circuit Protected
- Unique Transformer System (Patent Pending)
- Compact SIP7 Package
- Efficiency to 88%

### Selection Guide

| Part Number<br>SIP 7 | Standard Isolation (kVDC) | Reinforced Isolation (kVDC) | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency Std (/R) (%) | Max Capacitive Load <sup>(1)</sup> |
|----------------------|---------------------------|-----------------------------|---------------------|----------------------|---------------------|-------------------------|------------------------------------|
| RxxP23.3S            | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | 3.3                  | 600                 | 70 (72-78)              | 3300µF                             |
| RxxP205S             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | 5                    | 400                 | 70-75 (79-84)           | 1200µF                             |
| RxxP209S             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | 9                    | 222                 | 70-75 (80-87)           | 1200µF                             |
| RxxP212S             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | 12                   | 167                 | 70-75 (80-87)           | 680µF                              |
| RxxP215S             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | 15                   | 132                 | 75-80 (80-88)           | 680µF                              |
| RxxP23.3D            | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | ±3.3                 | ±300                | 70 (73-80)              | ±1500µF                            |
| RxxP205D             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | ±5                   | ±200                | 70-75 (79-85)           | ±470µF                             |
| RxxP209D             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | ±9                   | ±111                | 70-75 (80-87)           | ±470µF                             |
| RxxP212D             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | ±12                  | ±85                 | 70-75 (80-87)           | ±330µF                             |
| RxxP215D             | 5.2                       | /R6.4 & /R8                 | 5, 12, 15, 24       | ±15                  | ±66                 | 75-80 (80-88)           | ±330µF                             |

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

No suffix is functional isolation e.g. R05P205S

\* 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

\* add Suffix "/R6.4" or "/R8" for Reinforced Isolation, e.g. R05P205D/R6.4, R05P205S/P/X2/R8

### Specifications (measured at T<sub>A</sub> = 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<br>other output types      | 15% max.<br>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. / 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       |
| /R6.4   | (tested for 1 second)                           | 6400VDC              |
|   | (rated for 1 minute)                            | 3200VAC / 60Hz       |
| /R8   | (tested for 1 second)                           | 8000VDC              |
|   | (rated for 1 minute)                            | 4000VAC / 60Hz       |
| Isolation Capacitance                             | 1.5pF 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  |                      |

cont.

# ECONOLINE

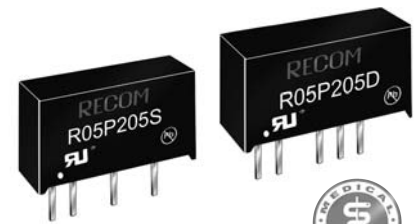
## DC/DC-Converter

with 3 year Warranty

# RECOM

## 2 Watt

# SIP 7 Single & Dual Output



**EN-60950-1 Certified**

**EN-60601-1 Certified**

**UL/CSA 60950-1 Certified**

**UL/CSA 60601-1 Certified (/R)**

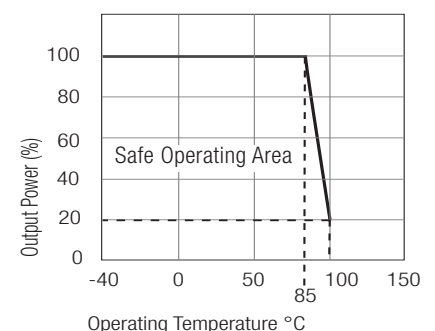
**EN-61010-1 Certified (/R)**

# RxxP2xx(R)

### Description

The RxxP2xxS\_D Series of DC/DC Converters are certified to UL/CSA-60950 and UL/CSA 60601. This makes them ideal for medical and safety applications where approved or reinforced isolation is required. The reinforced versions are also EN61010-1 certified for Lab Equipment. The /X2 version has an input/output clearance of more than 9mm.

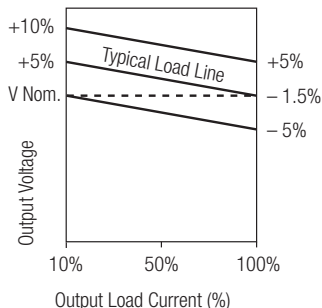
## Derating-Graph (Ambient Temperature)



Refer to Application Notes

www.recom-electronic.com

### Tolerance Envelope



### Specifications (continued)

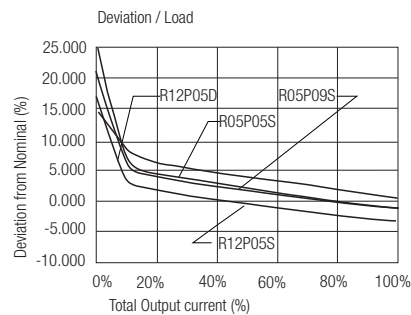
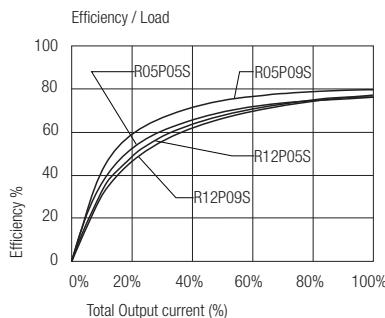
|  |                           |                                    |  |
|--|---------------------------|------------------------------------|--|
| Package Weight   | 4.3g                      |                                    |  |
| Packing Quantity   | 25 pcs per Tube           |                                    |  |
| MTBF (+25°C)   | Single/Dual               | 2113/2434 x 10 <sup>3</sup> hours  |  |
| } <i>Detailed Information see Application Notes chapter "MTBF"</i> | Reinforced                | 1154 x 10 <sup>3</sup> hours       |  |
|  | Single/Dual               | 299/334 x 10 <sup>3</sup> hours    |  |
| using MIL-HDBK 217F  | Reinforced                | 168 x 10 <sup>3</sup> hours        |  |
| Reinforced Isolation   | Transformer Creepage      | /R6.4 Types                        | 5.5 mm min.                                |
|  | Transformer Clearance     | /R6.4 Types                        | 5.5 mm min.                                |
|  | PCB Creepage & Clearance  | /R6.4 Types                        | 4.8 mm min.                                |
| Certifications   | CB Report: Medical Safety | Ref: CA/11158/CSA                  | IEC60601-1:1988 + A1: 1991 + A2:1995       |
| Reinforced Part  | CSA Medical Safety        | Report: 227629                     | C22.2 601-1 2nd Ed.<br>UL 60601-1 1st Ed.  |
|  | CSA General Safety        | Report: 2219431                    | C22.2 No. 60950-1-03<br>UL 60950-1 1st Ed. |
|  |                           | Recognised as Reinforced Isolation | Supplement to Report: 2219431              |
| Measurement, Control and Laboratory Use Safety                     |                           | Report: IL091212010M1              | EN 61010-1 : 2001                          |
| Certifications   | UL General Safety         | Report: E248550                    | UL 60950-1 1st Ed.                         |
| Standard Part  |                           |                                    | C22.2 No. 60950-1-03                       |
|  | EN General Safety         | Report: PS-R7219C1                 | EN60950-1:2001 + A11: 2004                 |
|  | EN Medical Safety         | Report: PS090301601                | EN60601-1:1990 + A13: 1996                 |

### Notes

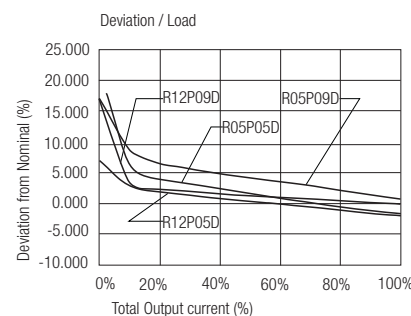
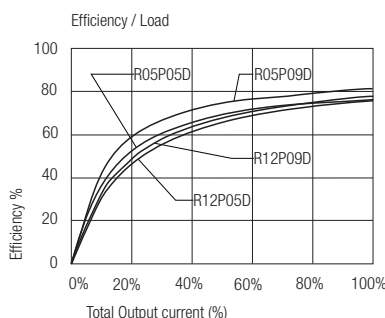
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Typical Characteristics

## RxxP205/09S

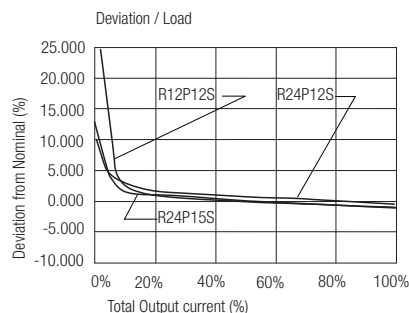
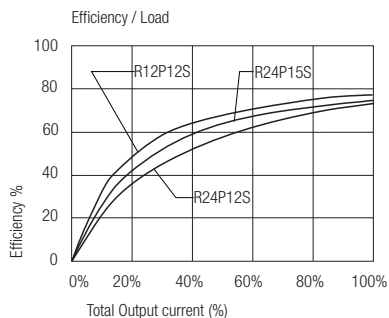


## RxxP205/09D

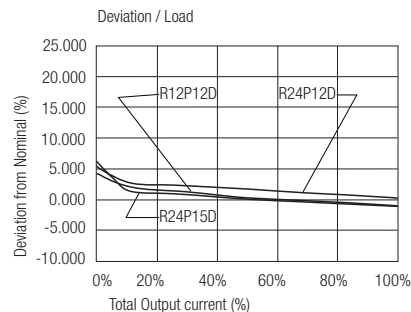
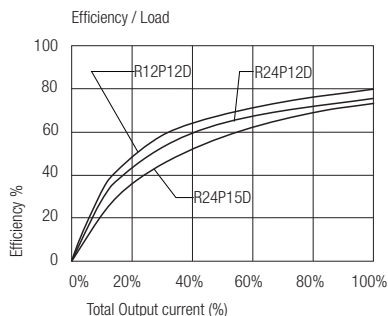


Typical Characteristics

## RxxP212/15S



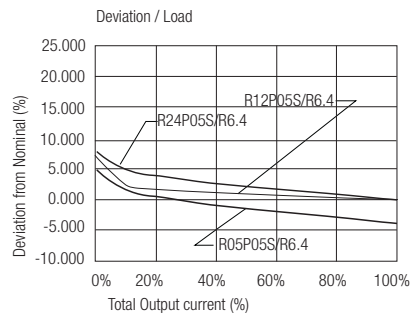
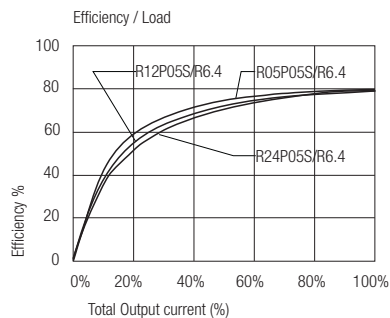
## RxxP212/15D



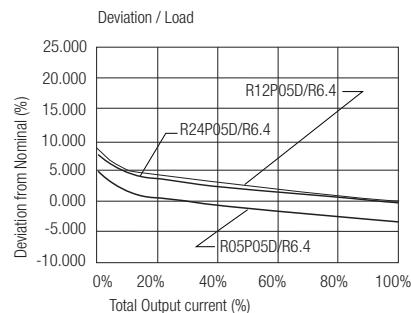
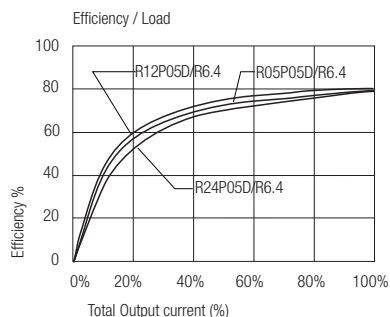
Typical Characteristics - Reinforced Version

RxxP2xx(/R)

## RxxP205S/R6.4 RxxP205S/R8



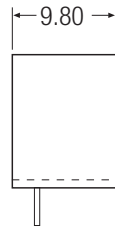
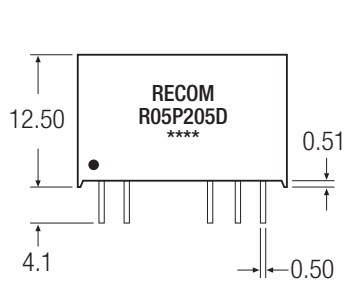
## RxxP205D/R6.4 RxxP205D/R8



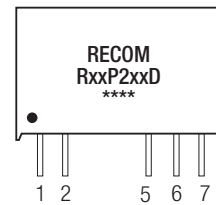
### Package Style and Pinning (mm)

7 PIN SIP Package

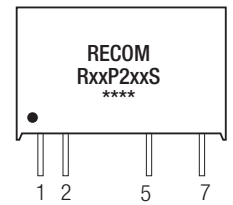
3rd angle projection 



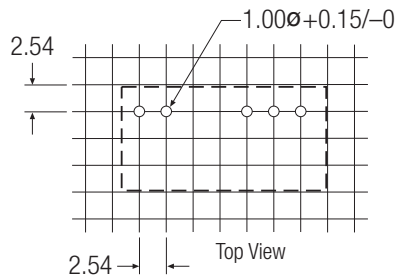
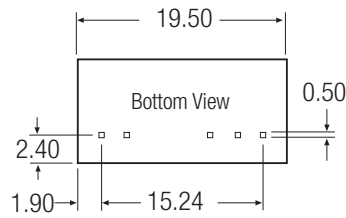
Dual Output



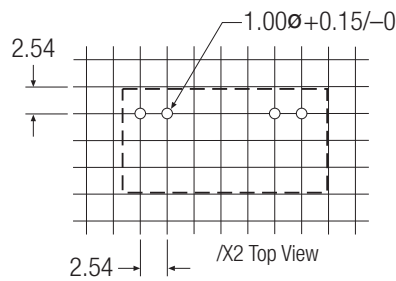
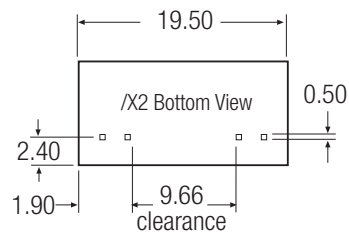
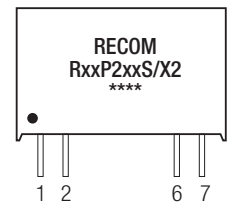
Single Output



Recommended Footprint Details



/X2 Single 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