

## Features

### Regulated Converters

- Controllable Output
- 1kVDC Isolation
- No Heatsink Required
- UL94V-0 Package Material
- Optional Continuous Short Circuit Protected
- No External Components
- Fully Encapsulated
- Efficiency to 70%

## ECONOLINE

DC/DC-Converter

# RY & RX Series

### Selection Guide

| Part Number | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency (%) |       |
|-------------|---------------------|----------------------|---------------------|----------------|-------|
| SIP 7       | DIP 14              | (VDC)                | (mA)                | (%)            |       |
| RY-xx05S    | RX-xx05S            | 5, 9, 12, 15, 24     | 5                   | 180            | 58-60 |
| RY-xx09S    | RX-xx09S            | 5, 9, 12, 15, 24     | 9                   | 111            | 56-62 |
| RY-xx12S    | RX-xx12S            | 5, 9, 12, 15, 24     | 12                  | 84             | 60-66 |
| RY-xx15S    | RX-xx15S            | 5, 9, 12, 15, 24     | 15                  | 66             | 60-66 |
| RY-xx24S    | RX-xx24S            | 5, 9, 12, 15, 24     | 24                  | 42             | 60-68 |
| RY-xx05D    | RX-xx05D            | 5, 9, 12, 15, 24     | ±5                  | ±100           | 50-58 |
| RY-xx09D    | RX-xx09D            | 5, 9, 12, 15, 24     | ±9                  | ±55            | 52-60 |
| RY-xx12D    | RX-xx12D            | 5, 9, 12, 15, 24     | ±12                 | ±42            | 58-68 |
| RY-xx15D    | RX-xx15D            | 5, 9, 12, 15, 24     | ±15                 | ±33            | 62-68 |
| RY-xx24D    | RX-xx24D            | 5, 9, 12, 15, 24     | ±24                 | ±21            | 64-70 |

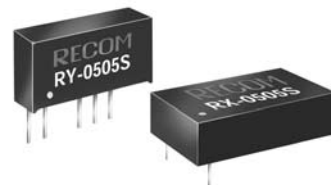
xx = Input Voltage

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RY-0505S/P, RX-0505S/P

### Specifications (Core Operating Area)

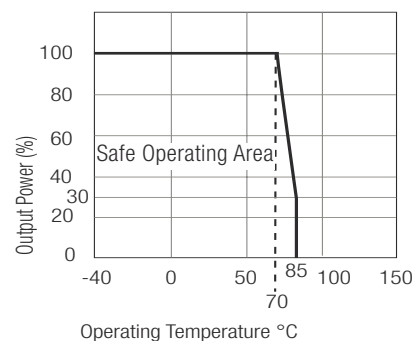
|   |   |                                      |                                      |
|---|---|--------------------------------------|--------------------------------------|
| Input Voltage Range                               |   |                                      | ±5%                                  |
| Output Voltage Accuracy                           |   |                                      | ±5%                                  |
| Line Voltage Regulation                           |   |                                      | ±1% max.                             |
| Load Voltage Regulation (10% to 100% full load)   |   |                                      | ±1% max.                             |
| Output Ripple and Noise (20MHz limited)           |   |                                      | 100mVp-p max.                        |
| Operating Frequency                               |   |                                      | 30kHz min. / 50kHz typ. / 88kHz max. |
| Efficiency at Full Load                           |   |                                      | 54% min. / 60% typ.                  |
| No Load Power Consumption                         | Single  | 171mW min. / 232mW typ. / 390mW max. |                                      |
|   | Dual  | 188mW min. / 264mW typ. / 350mW max. |                                      |
| Isolation Voltage                                 | (tested for 1 second)                                       | 1000VDC min.                         |                                      |
| Rated Working Voltage                             | (long term isolation)                                       | see Application Notes                |                                      |
| Isolation Capacitance                             | Single output types   | 30pF min. / 150pF max.               |                                      |
|   | Dual output types   | 40pF min. / 72pF max.                |                                      |
| Isolation Resistance                              |   |                                      | 10 GΩ min.                           |
| Short Circuit Protection                          |   |                                      | 1 Second                             |
| P-Suffix  |   |                                      | Continuous                           |
| Operating Temperature Range (free air convection) |   |                                      | -40°C to +70°C (see Graph)           |
| Storage Temperature Range                         |   |                                      | -55°C to +125°C                      |
| Relative Humidity                                 |   |                                      | 95% RH                               |
| Package Weight                                    | RX Single output types                                      | 2.9g                                 |                                      |
|   | RX Dual output types  | 2.7g                                 |                                      |
| MTBF (+25°C)                                      | using MIL-HDBK 217F   | RX types                             | 924 x 10 <sup>3</sup> hours          |
| (+70°C)   | } Detailed Information see Application Notes chapter "MTBF" | RX types                             | 944 x 10 <sup>3</sup> hours          |
|   |   | using MIL-HDBK 217F                  | RX types                             |
|   |   | RX types                             | 130 x 10 <sup>3</sup> hours          |

## 1 Watt SIP7 & DIP14 Single & Dual Output



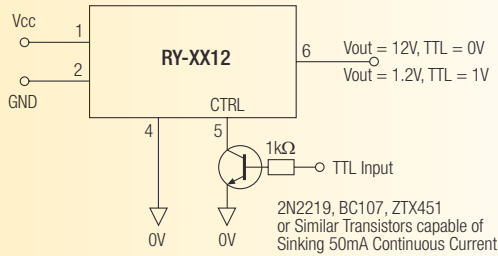
# RECOM

## Derating-Graph (Ambient Temperature)

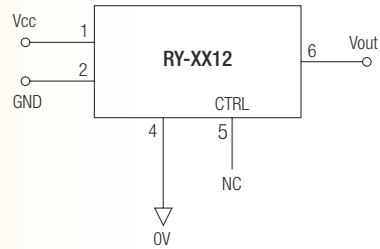


**Typical Applications**

Flash PROM Programming Voltage Control

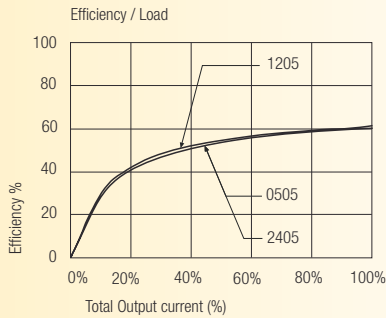


Normal Isolated Regulated Output

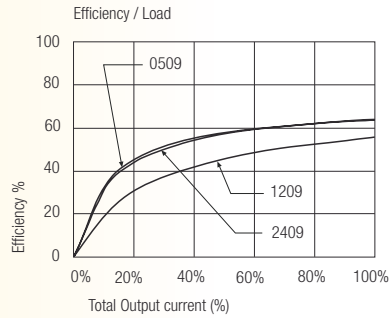


**Typical Characteristics**

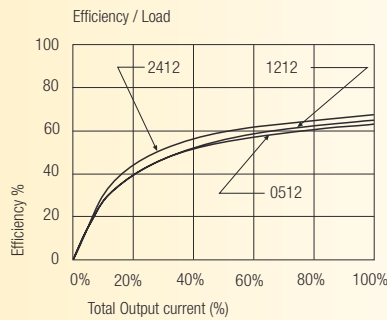
**RY/RX-xx05S**



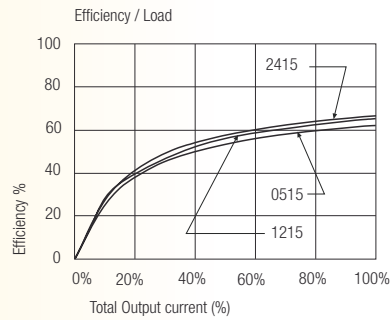
**RY/RX-xx09S**



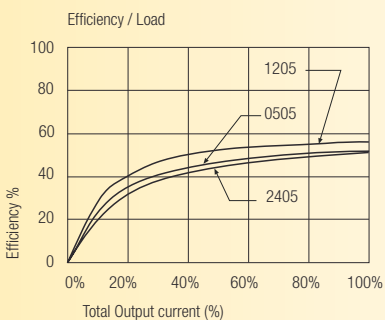
**RY/RX-xx12S**



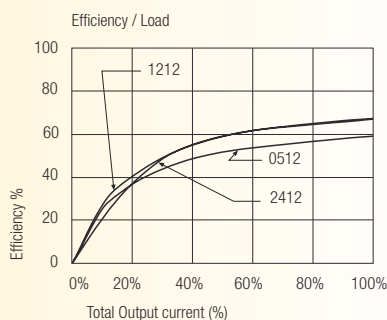
**RY/RX-xx15S**



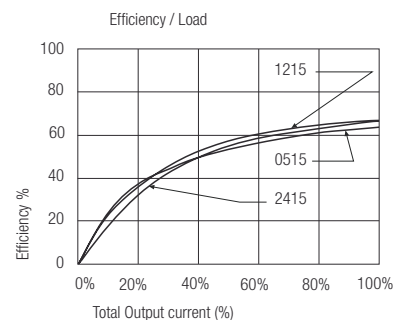
**RY/RX-xx05D**



**RY/RX-xx12D**



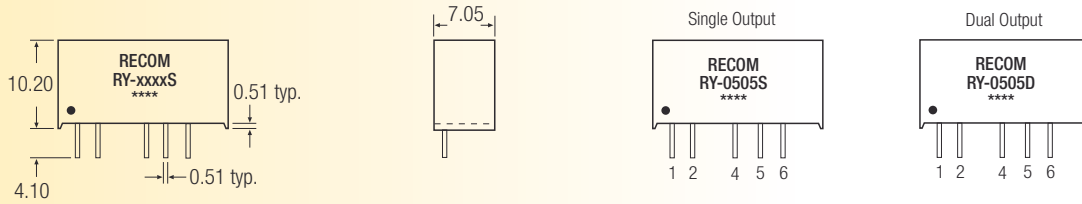
**RY/RX-xx15D**



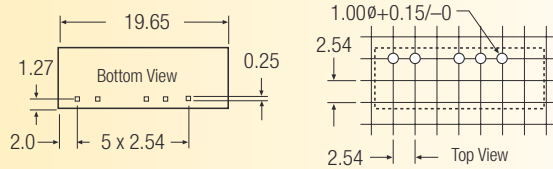
**Package Style and Pinning (mm)**



**7 PIN SIP Package**



**Recommended Footprint Details**

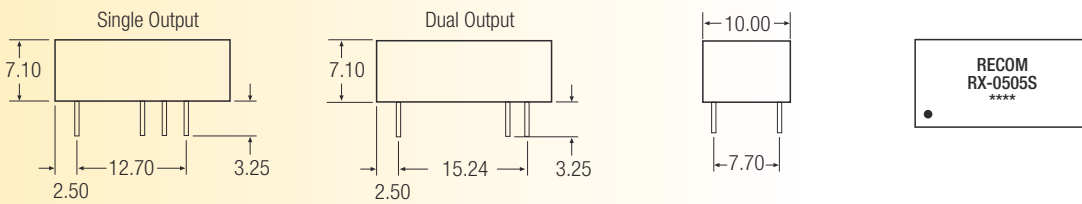


**RX Pin Connections**

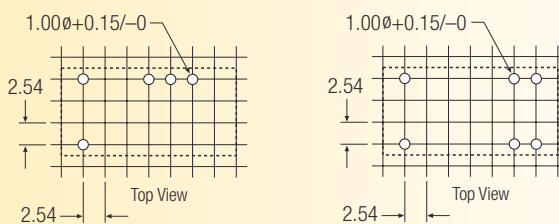
| Pin # | Single | Dual  |
|-------|--------|-------|
| 1     | +Vin   | +Vin  |
| 2     | -Vin   | -Vin  |
| 4     | -Vout  | -Vout |
| 5     | CTRL   | Com   |
| 6     | +Vout  | +Vout |

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

**14 PIN DIP Package**



**Recommended Footprint Details**



**RX Pin Connections**

| Pin # | Single | Dual   |
|-------|--------|--------|
| 1     | -Vin   | -Vin   |
| 6     | No Pin | +Vout  |
| 7     | No Pin | Com    |
| 8     | No Pin | -Vout  |
| 9     | +Vout  | Com    |
| 10    | CTRL   | No Pin |
| 11    | -Vout  | No Pin |
| 14    | +Vin   | +Vin   |

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm