

## Features

## Unregulated Converters

Rev.2

- Custom Solutions Available
- 1kVDC Isolation
- No External Components Required
- Optional Continuous Short Circuit Protected
- UL94V-0 Package Material
- No Heatsink Required
- Efficiency to 87 %

**ECONOLINE**

DC/DC-Converter

# RI Series

**2 Watt**

**SIP4**

**Single Output**

### Description

The RI series has been specifically designed for applications where board space is at a premium since these 2 Watt converters have only a slightly larger foot print than the RO series 1 Watt converters.

With efficiencies up to 87%, the full output power is available over the operating temperature range -40°C to +85°C and the converters can be used in ambient temperatures of up to 100°C with derating. The wide selection of input voltage and output voltage options plus an I/O-Isolation of 1kVDC as standard makes these converters suitable for many industrial applications.

### Selection Guide

| Part Number<br>SIP4 | Input Voltage<br>(VDC) | Output Voltage<br>(VDC) | Output Current<br>(mA) | Efficiency<br>(%) |
|---------------------|------------------------|-------------------------|------------------------|-------------------|
| RI-xx05S            | 5, 12, 15, 24          | 5                       | 400                    | 78-83             |
| RI-xx12S            | 5, 12, 15, 24          | 12                      | 167                    | 80-85             |
| RI-xx15S            | 5, 12, 15, 24          | 15                      | 133                    | 80-85             |

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

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

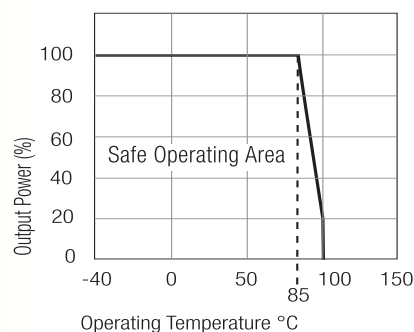
### Specifications (measured at $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

|                                                    |                                                                |                                      |                 |
|----------------------------------------------------|----------------------------------------------------------------|--------------------------------------|-----------------|
| Input Voltage Range                                |                                                                | ±10%                                 |                 |
| Output Voltage Accuracy                            |                                                                | ±5%                                  |                 |
| Line Voltage Regulation                            |                                                                | 1.2%/1% of Vin typ.                  |                 |
| Load Voltage Regulation<br>(10% to 100% full load) | 5V output type                                                 | 15% max.                             |                 |
|                                                    | 12V, 15V output types                                          | 10% max.                             |                 |
| Output Ripple and Noise (20MHz limited)            |                                                                | 200mVp-p max.                        |                 |
| Operating Frequency                                |                                                                | 35kHz min. / 50kHz typ. / 85kHz max. |                 |
| Efficiency at Full Load                            |                                                                | 70% min. / 80% typ.                  |                 |
| No Load Power Consumption                          |                                                                | 142mW min. / 185mW typ. / 350mW max. |                 |
| Maximum Capacitive Load                            |                                                                | 47µF                                 |                 |
| Isolation Voltage                                  | (tested for 1 second)                                          | 1000VDC min.                         |                 |
| Rated Working Voltage                              | (long term isolation)                                          | see Application Notes                |                 |
| Isolation Capacitance                              |                                                                | 30pF min. / 85pF max.                |                 |
| Isolation Resistance                               |                                                                | 10 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                                     |                                                                | 1.4g                                 |                 |
| MTBF (+25°C)                                       | } Detailed Information see<br>Application Notes chapter "MTBF" | using MIL-HDBK 217F                  | 845 x 10³ hours |
| (+85°C)                                            |                                                                | using MIL-HDBK 217F                  | 160 x 10³ hours |



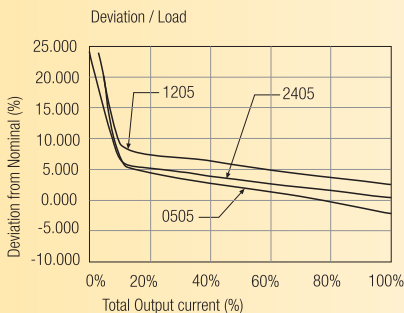
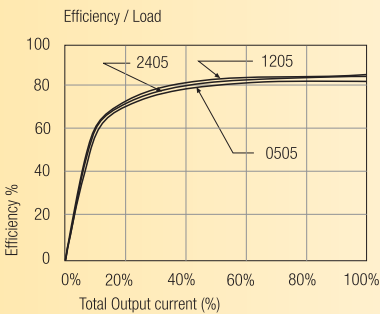
**RECOM**

## Derating-Graph (Ambient Temperature)

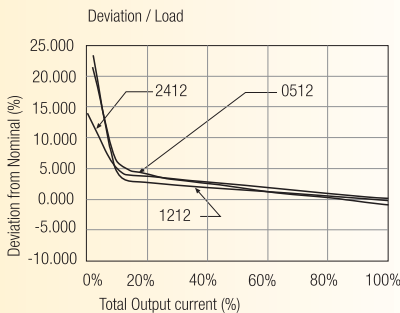
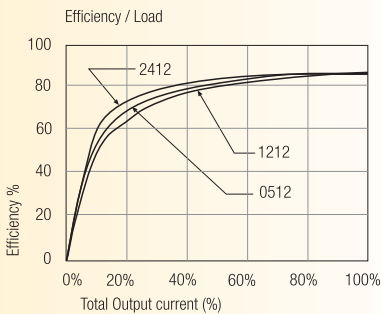


Typical Characteristics

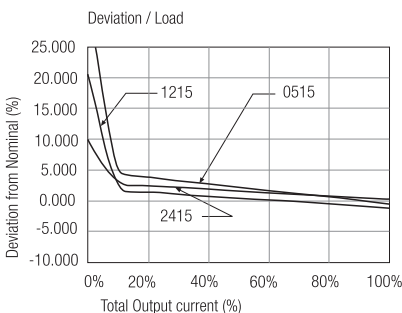
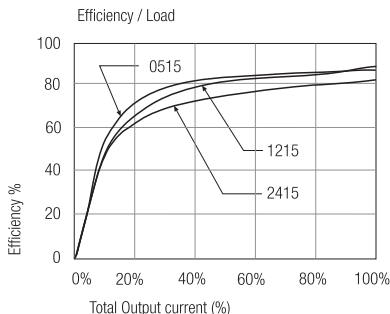
RI-xx05S



RI-xx12S



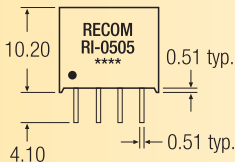
RI-xx15S



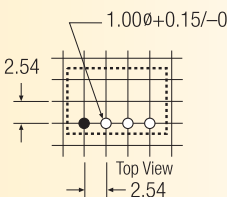
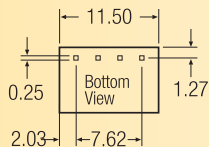
Package Style and Pinning (mm)



4 PIN SIP Package



Recommended Footprint Details



Pin Connections

| Pin # | Dual      |
|-------|-----------|
| 1     | -Vin      |
| 2     | +Vin      |
| 3     | -Vout     |
| 4     | +Vout     |
| XX.X  | ± 0.5 mm  |
| XX.XX | ± 0.25 mm |