

## Features

### Unregulated Converters

- Custom Solutions Available
- 1kVDC Isolation
- No External Components Required
- Optional Continuous Short Circuit Protected
- UL94V-0 Package Material
- No Heatsink Required
- Efficiency to 85%

#### 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>(%) | Max Capacitive Load <sup>m</sup> |
|---------------------|------------------------|-------------------------|------------------------|-------------------|----------------------------------|
| RI-xx05S            | 5, 12, 15, 24          | 5                       | 400                    | 78-83             | 1200µF                           |
| RI-xx12S            | 5, 12, 15, 24          | 12                      | 167                    | 80-85             | 680µF                            |
| RI-xx15S            | 5, 12, 15, 24          | 15                      | 133                    | 80-85             | 680µF                            |

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                               | $\pm 10\%$                                                |                                                 |
| Output Voltage Accuracy                           | $\pm 5\%$                                                 |                                                 |
| Line Voltage Regulation                           | 1.2%/1% of $V_{in}$ typ.                                  |                                                 |
| Load Voltage Regulation                           | 5V Output types                                           | 15% max.                                        |
| (10% to 100% full load)                           | All others                                                | 10% max.                                        |
| Output Ripple and Noise (20MHz limited)           | 200mVp-p max.                                             |                                                 |
| Operating Frequency                               | 20kHz min. / 50kHz typ. / 85kHz max.                      |                                                 |
| Efficiency at Full Load                           | 70% min. / 80% typ.                                       |                                                 |
| Minimum Load = 0%                                 | Specifications valid for 10% minimum load only.           |                                                 |
| Isolation Voltage                                 | (tested for 1 second)                                     | 1000VDC                                         |
|                                                   | (rated for 1 minute)                                      | 500VAC / 60Hz                                   |
| 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                                                      |                                                 |
| Packing Quantity                                  | 42 pcs per Tube                                           |                                                 |
| MTBF (+25°C)                                      | Detailed Information see Application Notes chapter "MTBF" | using MIL-HDBK 217F 845 x 10 <sup>3</sup> hours |
| (+85°C)                                           |                                                           | using MIL-HDBK 217F 160 x 10 <sup>3</sup> hours |

#### Certifications

EN General Safety

Report: SPCLVD1109103

EN60950-1:2006 + A12:2011

\*\*Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.

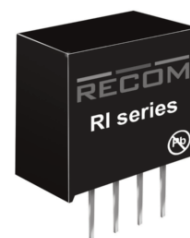
## ECONOLINE

### DC/DC-Converter

with 3 year Warranty

RECOM

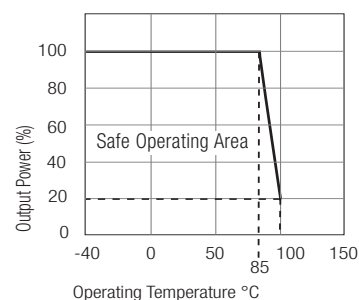
## 2 Watt SIP4 Single Output



EN-60950-1 Certified

RI

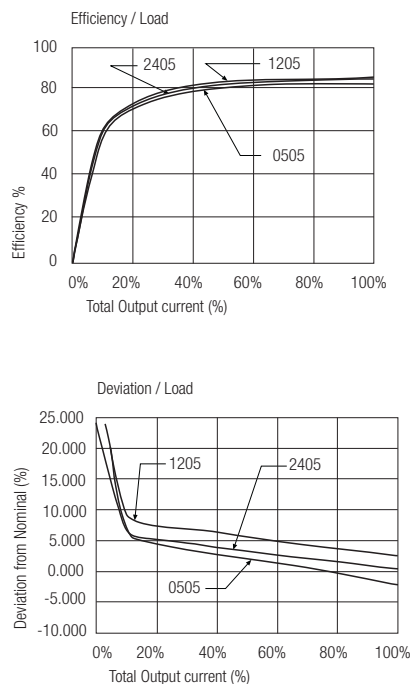
## Derating-Graph (Ambient Temperature)



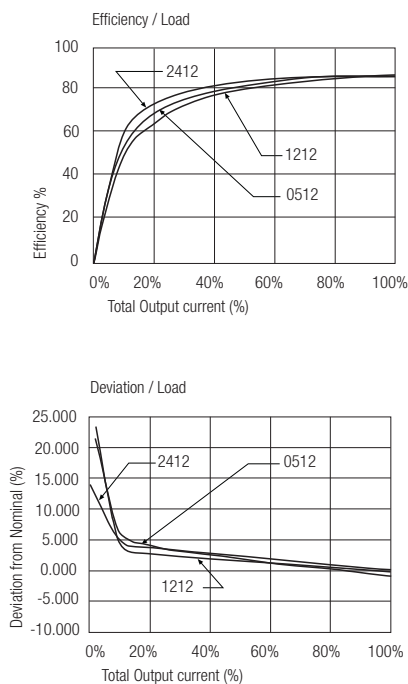
Refer to Application Notes

Typical Characteristics

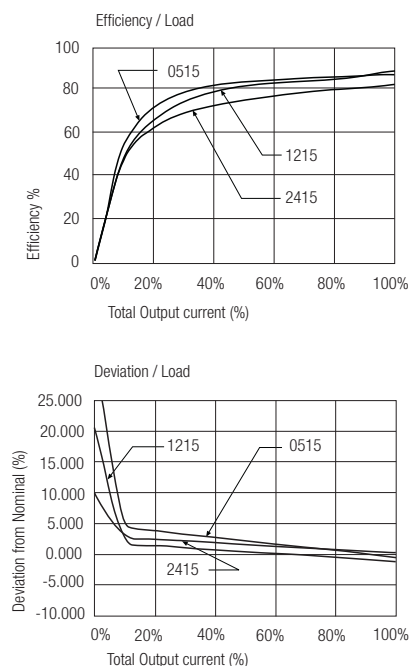
**RI-xx05S**



**RI-xx12S**



**RI-xx15S**

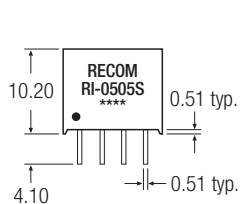


Notes

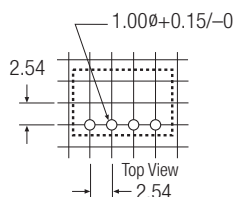
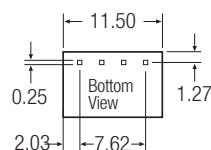
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

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 |