

## Features

### Unregulated Converter

- Single Output Rail
- Industry Standard Pinout
- 1kVDC or 2kVDC Isolation
- High Efficiency for Low Power Applications
- UL94V-0 Package Material
- Optional Continuous Short Circuit Protected
- Fully Encapsulated
- Custom versions available
- Efficiency to 76%

#### Description

The RM series DC/DC converter has been designed for isolating or converting DC power rails with very light loads. Efficiencies are typically 10% higher than a comparable 0.5W or 1W converters run at the same low load.

#### Selection Guide

| Part Number<br>SIP 4 | (2kV) | Input Voltage<br>(VDC) | Output Voltage<br>(VDC) | Output Current<br>(mA) | Efficiency<br>(%) | Max. Capacitive Load <sup>(1)</sup> |
|----------------------|-------|------------------------|-------------------------|------------------------|-------------------|-------------------------------------|
| RM-xx3.3S            | (H)   | 3.3, 5, 12, 15, 24     | 3.3                     | 76                     | 65-70             | 1000µF                              |
| RM-xx05S             | (H)   | 3.3, 5, 12, 15, 24     | 5                       | 50                     | 66-72             | 470µF                               |
| RM-xx09S             | (H)   | 3.3, 5, 12, 15, 24     | 9                       | 28                     | 70-72             | 470µF                               |
| RM-xx12S             | (H)   | 3.3, 5, 12, 15, 24     | 12                      | 21                     | 70-72             | 150µF                               |
| RM-xx15S             | (H)   | 3.3, 5, 12, 15, 24     | 15                      | 17                     | 70-76             | 150µF                               |

xx = Input Voltage (other input and output voltage combinations and output powers available on request)

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

#### 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                           | 3.3V output types                                           | 20% max.                                         |
| (10% to 100% full load)                           | 5V output type                                              | 15% max.                                         |
|                                                   | 12V, 15V, 24V output types                                  | 10% max.                                         |
| Output Ripple and Noise (20MHz limited)           | 50mVp-p max.                                                |                                                  |
| Operating Frequency                               | 50kHz min. / 90kHz typ. / 105kHz max.                       |                                                  |
| Efficiency at Full Load                           | 65% min. / 75% 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 Voltage                                 | H-Suffix (tested for 1 second)                              | 2000VDC                                          |
|                                                   | H-Suffix (rated for 1 minute**)                             | 1400VAC / 60Hz                                   |
| Isolation Capacitance                             | 25pF min. / 82pF max.                                       |                                                  |
| Isolation Resistance                              | 10 GΩ min.                                                  |                                                  |
| Short Circuit Protection                          | 1 Second                                                    |                                                  |
| P-Suffix                                          | Continuous                                                  |                                                  |
| Operating Temperature Range (free air convection) | $-40^\circ\text{C}$ to $+85^\circ\text{C}$ (see Graph)      |                                                  |
| Storage Temperature Range                         | $-55^\circ\text{C}$ to $+125^\circ\text{C}$                 |                                                  |
| Relative Humidity                                 | 95% RH                                                      |                                                  |
| Package Weight                                    | RM types                                                    | 1.4g                                             |
|                                                   | RL types                                                    | 1.8g                                             |
| Packing Quantity                                  | 42 pcs per Tube                                             |                                                  |
| MTBF ( $+25^\circ\text{C}$ )                      | } Detailed Information see Application Notes chapter "MTBF" | using MIL-HDBK 217F 1327 x 10 <sup>3</sup> hours |
| ( $+85^\circ\text{C}$ )                           |                                                             | using MIL-HDBK 217F 302 x 10 <sup>3</sup> hours  |

continued on the next page

## ECONOLINE

### DC/DC-Converter

with 3 year Warranty

# RECOM

## 0.25 Watt

## SIP4

## Single Output



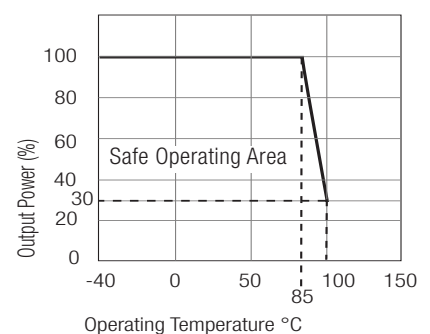
E358085

**EN-60950-1 Certified**  
**UL-60950-1 Certified**  
**IEC/EN-60601-1 Certified\***  
**\*/H suffix)**

# RM

## Derating-Graph

(Ambient Temperature)



\*\*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.

Refer to Application Notes

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

#### Certifications

UL General Safety

Report: E358085

UL 60950-1, 2nd Edition

EN General Safety

Report: SPCLVD1109103

EN 60950-1:2006 + A12:2011

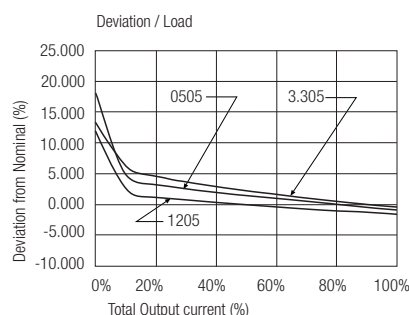
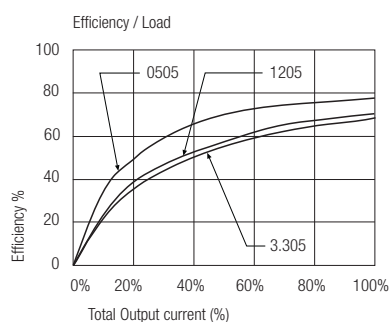
EN Medical Safety

Report: MDD1112018 + RM1112018

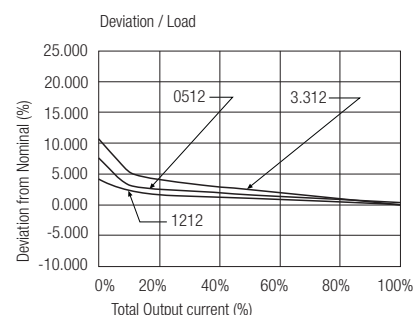
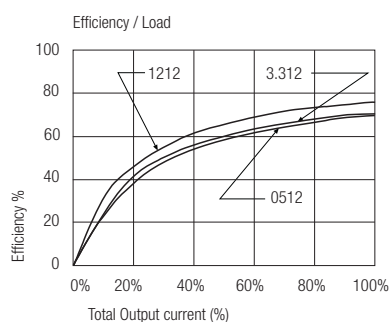
IEC/EN 60601-1 3rd Edition Medical Report + ISO14971 Risk Assessment

### Typical Characteristics

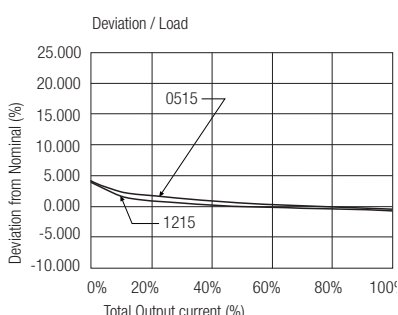
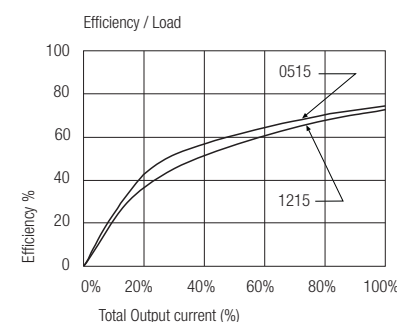
## RM-xx05S



## RM-xx12S



## RM-xx15S

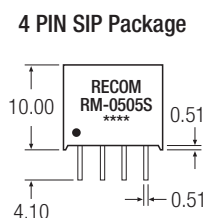


#### Notes

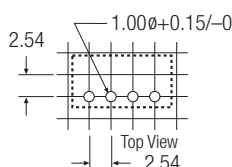
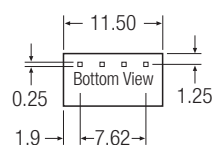
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Package Style and Pinning (mm)

#### 4 PIN SIP Package



#### Recommended Footprint Details



#### RM Pin Connections

| Pin #               | Single |
|---------------------|--------|
| 1                   | -Vin   |
| 2                   | +Vin   |
| 3                   | -Vout  |
| 4                   | +Vout  |
| XX.X $\pm$ 0.5 mm   |        |
| XX.XX $\pm$ 0.25 mm |        |

The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.