

## 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                                |                                                                | ±10%                                            |                  |
| Output Voltage Accuracy                            |                                                                | ±5%                                             |                  |
| Line Voltage Regulation                            |                                                                | 1.2%/1% of Vin typ.                             |                  |
| Load Voltage Regulation<br>(10% to 100% full load) | 3.3V output types                                              | 20% max.                                        |                  |
|                                                    | 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°C to +85°C (see Graph)                      |                  |
| Storage Temperature Range                          |                                                                | -55°C to +125°C                                 |                  |
| Relative Humidity                                  |                                                                | 95% RH                                          |                  |
| Package Weight                                     | RM types                                                       | 1.4g                                            |                  |
|                                                    | RL types                                                       | 1.8g                                            |                  |
| Packing Quantity                                   |                                                                | 42 pcs per Tube                                 |                  |
| MTBF (+25°C)<br>(+85°C)                            | } Detailed Information see<br>Application Notes chapter "MTBF" | using MIL-HDBK 217F                             | 1327 x 10³ hours |
|                                                    |                                                                | using MIL-HDBK 217F                             | 302 x 10³ hours  |

continued on the next page

\*\*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

## 0.25 Watt SIP4 Single Output

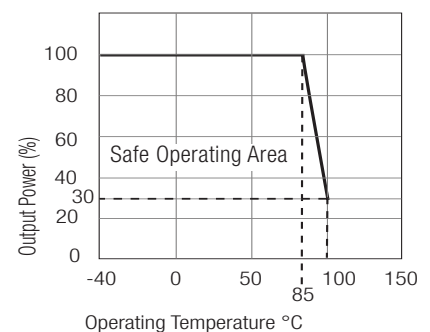


E358085

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

# RM

## Derating-Graph (Ambient Temperature)



### 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

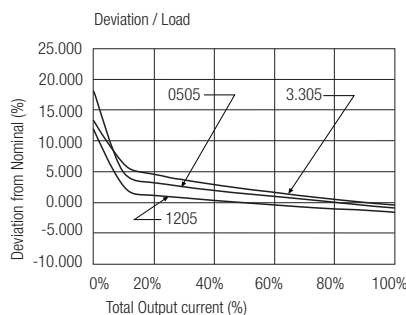
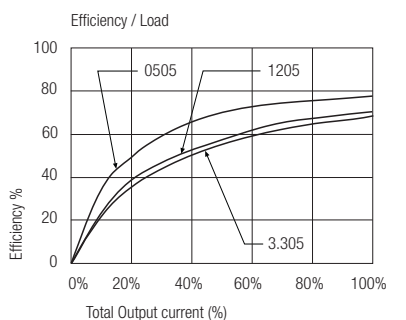
EN Medical Safety

Report: MDD1112018 + RM1112018

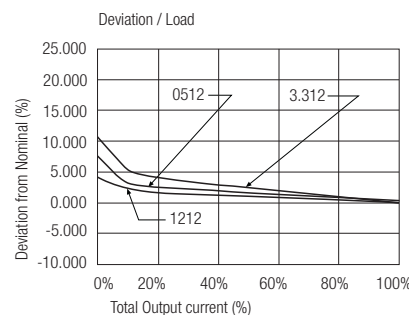
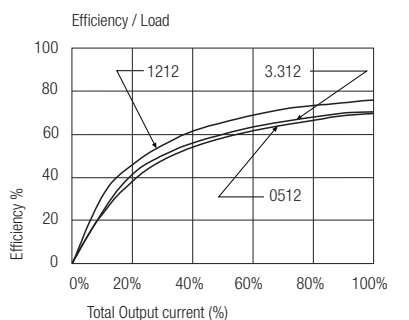
IEC/EN 60601-1 3rd Edition Medical Report + ISO14971 Risk Assessment

### Typical Characteristics

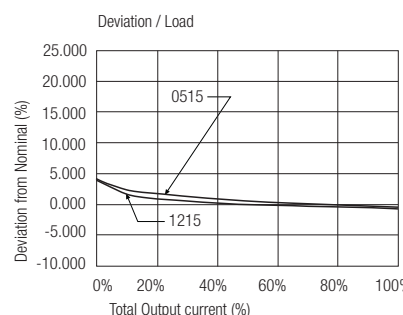
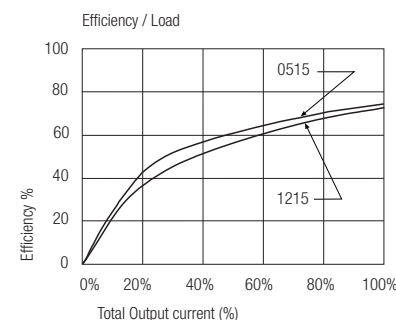
## RM-xx05S



## RM-xx12S



## RM-xx15S

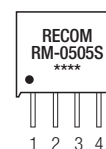
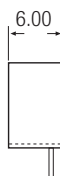
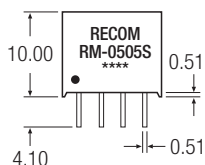


#### Notes

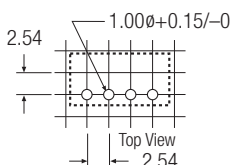
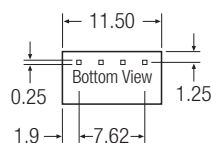
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### 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  | $\pm 0.5 \text{ mm}$  |
| XX.XX | $\pm 0.25 \text{ mm}$ |

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## RECOM:

[RM-0505S/H](#) [RM-0505S/HP](#) [RM-0505S/P](#) [RM-0509S](#) [RM-0509S/H](#) [RM-0509S/HP](#) [RM-0509S/P](#) [RM-0512S](#) [RM-0512S/H](#) [RM-0512S/HP](#) [RM-0512S/P](#) [RM-0515S](#) [RM-0515S/H](#) [RM-0515S/HP](#) [RM-0515S/P](#) [RM-053.3S](#) [RM-053.3S/H](#) [RM-053.3S/HP](#) [RM-053.3S/P](#) [RM-1205S](#) [RM-1205S/H](#) [RM-1205S/HP](#) [RM-1205S/P](#) [RM-1209S](#) [RM-1209S/H](#) [RM-1209S/HP](#) [RM-1209S/P](#) [RM-1212S](#) [RM-1212S/H](#) [RM-1212S/HP](#) [RM-1212S/P](#) [RM-1215S](#) [RM-1215S/H](#) [RM-1215S/HP](#) [RM-1215S/P](#) [RM-123.3S](#) [RM-123.3S/H](#) [RM-123.3S/HP](#) [RM-123.3S/P](#) [RM-1505S](#) [RM-1505S/H](#) [RM-1505S/HP](#) [RM-1505S/P](#) [RM-1509S](#) [RM-1509S/H](#) [RM-1509S/HP](#) [RM-1509S/P](#) [RM-1512S](#) [RM-1512S/H](#) [RM-1512S/HP](#) [RM-1512S/P](#) [RM-1515S](#) [RM-1515S/H](#) [RM-1515S/HP](#) [RM-1515S/P](#) [RM-153.3S](#) [RM-153.3S/H](#) [RM-153.3S/HP](#) [RM-153.3S/P](#) [RM-2405S](#) [RM-2405S/H](#) [RM-2405S/HP](#) [RM-2405S/P](#) [RM-2409S](#) [RM-2409S/H](#) [RM-2409S/HP](#) [RM-2409S/P](#) [RM-2412S](#) [RM-2412S/H](#) [RM-2412S/HP](#) [RM-2412S/P](#) [RM-2415S](#) [RM-2415S/H](#) [RM-2415S/HP](#) [RM-2415S/P](#) [RM-243.3S](#) [RM-243.3S/H](#) [RM-243.3S/HP](#) [RM-243.3S/P](#) [RM-3.305S](#) [RM-3.305S/H](#) [RM-3.305S/HP](#) [RM-3.305S/P](#) [RM-3.309S](#) [RM-3.309S/H](#) [RM-3.309S/HP](#) [RM-3.309S/P](#) [RM-3.312S](#) [RM-3.312S/H](#) [RM-3.312S/HP](#) [RM-3.312S/P](#) [RM-3.315S](#) [RM-3.315S/H](#) [RM-3.315S/HP](#) [RM-3.315S/P](#) [RM-3.33.3S](#) [RM-3.33.3S/H](#) [RM-3.33.3S/HP](#) [RM-3.33.3S/P](#) [RM-0505S](#)