

## Features

## Unregulated Converters

- Single Output Rail
- Industry Standard Pinout
- 1kVDC & 2kVDC Isolation
- High Efficiency for Low Power Applications
- UL94V-0 Package Material
- Optional Continuous Short Circuit Protected
- Fully Encapsulated
- Efficiency to 80%

## Selection Guide

| Part Number |           |       | Input Voltage              | Output Voltage | Output Current | Efficiency |
|-------------|-----------|-------|----------------------------|----------------|----------------|------------|
| SIP 4       | DIP8      | (2kV) | (VDC)                      | (VDC)          | (mA)           | (%)        |
| RM-xx1.8S   | RL-xx1.8S | (H)   | 1.8, 3.3, 5, 9, 12, 15, 24 | 1.8            | 139            | 70         |
| RM-xx3.3S   | RL-xx3.3S | (H)   | 1.8, 3.3, 5, 9, 12, 15, 24 | 3.3            | 76             | 65-70      |
| RM-xx05S    | RL-xx05S  | (H)   | 1.8, 3.3, 5, 9, 12, 15, 24 | 5              | 50             | 66-72      |
| RM-xx09S    | RL-xx09S  | (H)   | 1.8, 3.3, 5, 9, 12, 15, 24 | 9              | 28             | 70-72      |
| RM-xx12S    | RL-xx12S  | (H)   | 1.8, 3.3, 5, 9, 12, 15, 24 | 12             | 21             | 70-72      |
| RM-xx15S    | RL-xx15S  | (H)   | 1.8, 3.3, 5, 9, 12, 15, 24 | 15             | 17             | 70-76      |
| RM-xx24S    | RL-xx24S  | (H)   | 1.8, 3.3, 5, 9, 12, 15, 24 | 24             | 10             | 70-80      |

xx = Input Voltage

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RM-051.8S/P, RM-051.8S/HP

## Specifications (Core Operating Area)

|                                                   |                                                                             |                                                  |
|---------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------|
| Input Voltage Range                               |                                                                             | ±10%                                             |
| Output Voltage Accuracy                           |                                                                             | ±5%                                              |
| Line Voltage Regulation                           |                                                                             | 1.2%/1% of Vin typ.                              |
| Load Voltage Regulation (10% to 100% full load)   | 1.8V, 3.3V output types<br>5V output type<br>9V, 12V, 15V, 24V output types | 20% max.<br>15% max.<br>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.                              |
| No Load Power Consumption                         |                                                                             | 45mW min. / 75mW typ. / 155mW max.               |
| Isolation Voltage                                 | (tested for 1 second)                                                       | 1000VDC min.                                     |
| Rated Working Voltage                             | (long term isolation)                                                       | see Application Notes                            |
| Isolation Voltage                                 | H-Suffix (tested for 1 second)                                              | 2000VDC min.                                     |
| Rated Working Voltage                             | H-Suffix (long term isolation)                                              | see Application Notes                            |
| 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<br>RL types                                                        | 1.4g<br>1.8g                                     |
| MTBF (+25°C)                                      | Detailed Information see Application Notes chapter "MTBF"                   | using MIL-HDBK 217F 1327 x 10 <sup>3</sup> hours |
| (+85°C)                                           |                                                                             | using MIL-HDBK 217F 302 x 10 <sup>3</sup> hours  |

**ECONOLINE**

DC/DC-Converter

## RM & RL Series

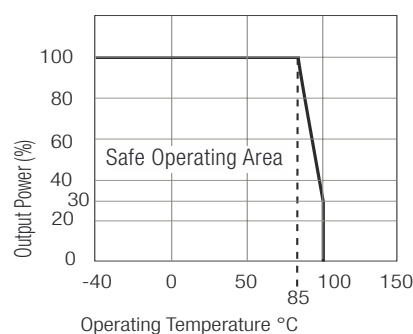
## 0.25 Watt SIP4 & DIP8 Single Output



**EN-60950-1 Certified**

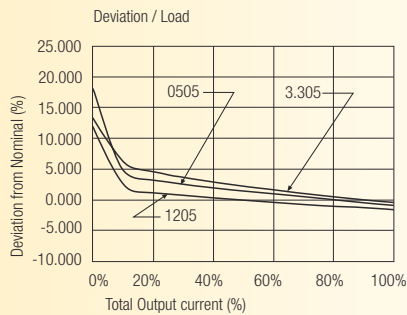
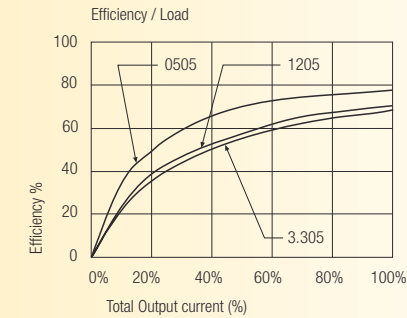
**RECOM**

## Derating-Graph (Ambient Temperature)

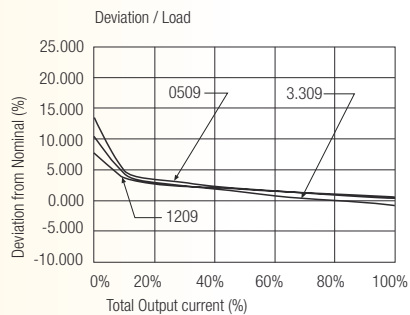
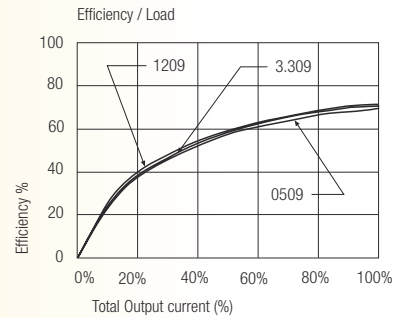


## Typical Characteristics

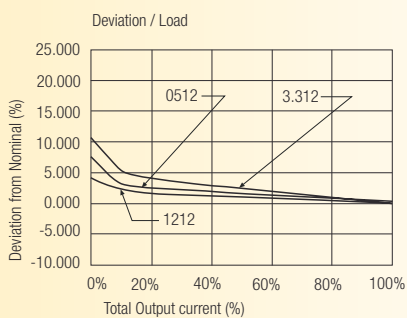
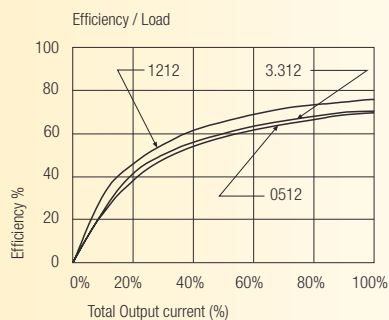
### RM/RL-xx05S



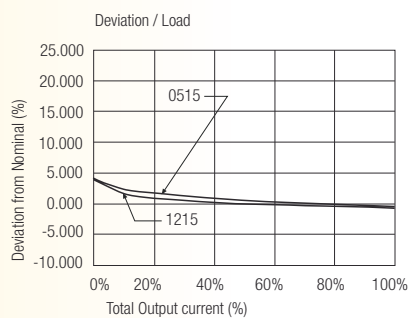
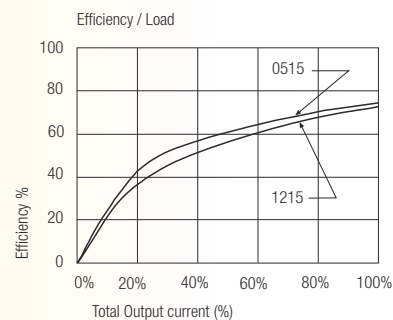
### RM/RL-xx09S



### RM/RL-xx12S



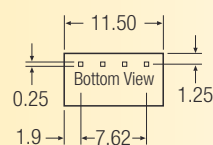
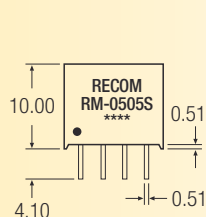
### RM/RL-xx15S



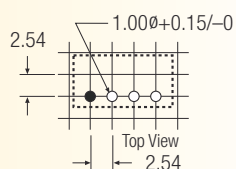
## Package Style and Pinning (mm)

### 4 PIN SIP Package

3rd angle  
projection



### Recommended Footprint Details

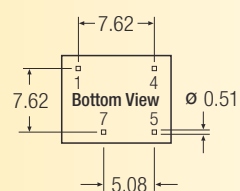
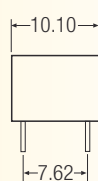
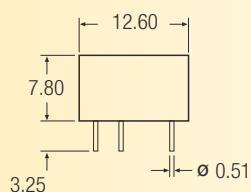


### RM Pin Connections

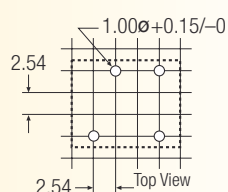
| Pin # | Single |
|-------|--------|
| 1     | -Vin   |
| 2     | +Vin   |
| 3     | -Vout  |
| 4     | +Vout  |

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

### 8 PIN DIP Package



### Recommended Footprint Details



### RL Pin Connections

| Pin # | Single |
|-------|--------|
| 1     | -Vin   |
| 4     | +Vin   |
| 5     | +Vout  |
| 7     | -Vout  |

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm