

## 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%

## ECONOLINE

DC/DC-Converter

# RM & RL Series

0.25 Watt

SIP4 & DIP8

Single Output

### Selection Guide

Part Number	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)	
SIP 4	DIP8 (2kV)	(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

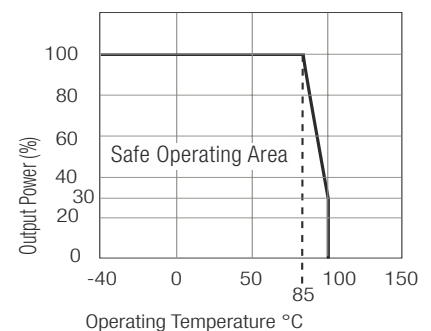


EN-60950-1 Certified

### Specifications (Core Operating Area)

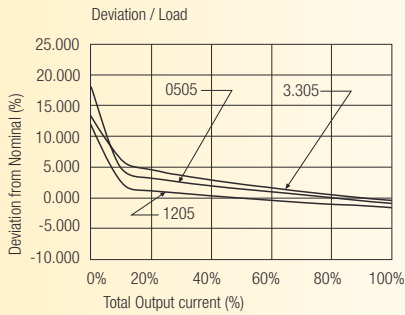
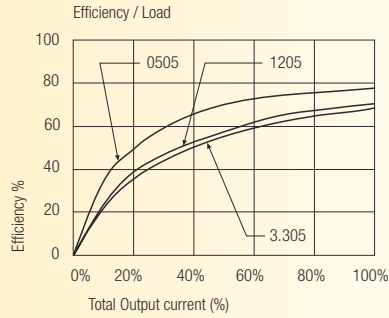
Input Voltage Range		±10%
Output Voltage Accuracy		±5%
Line Voltage Regulation		1.2%/1% of Vin typ.
Load Voltage Regulation (10% to 100% full load)	1.8V, 3.3V output types 5V output type 9V, 12V, 15V, 24V output types	20% max. 15% max. 10% max.
Output Ripple and Noise (20MHz limited)		50mVp-p max.
Operating 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 RL types	1.4g 1.8g
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F
(+85°C)		using MIL-HDBK 217F
		1327 x 10 <sup>3</sup> hours
		302 x 10 <sup>3</sup> hours

## Derating-Graph (Ambient Temperature)

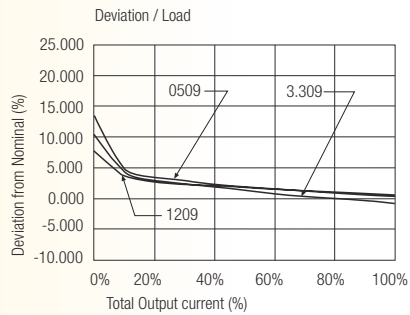
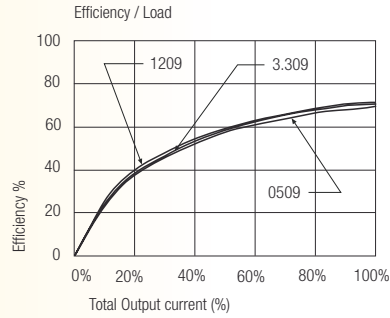


**Typical Characteristics**

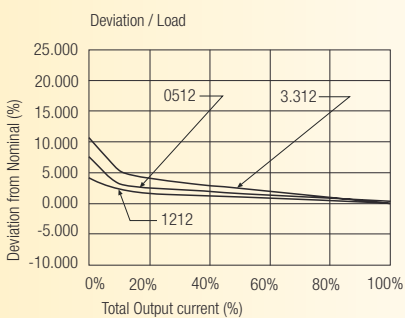
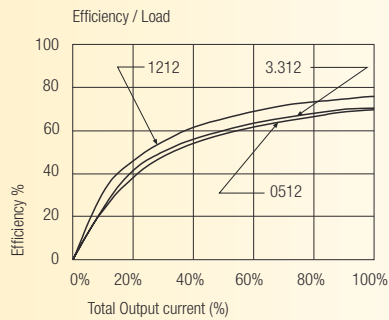
**RM/RL-xx05S**



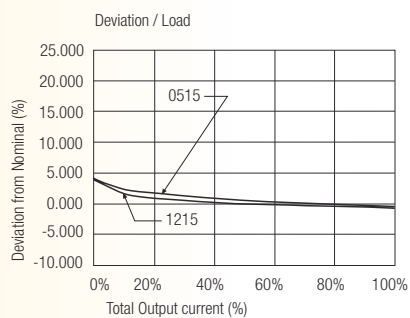
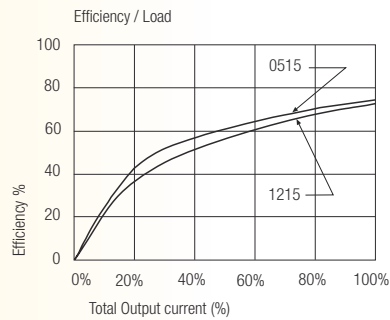
**RM/RL-xx09S**



**RM/RL-xx12S**

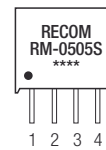
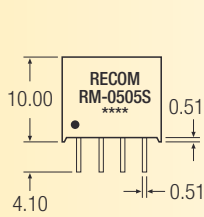


**RM/RL-xx15S**

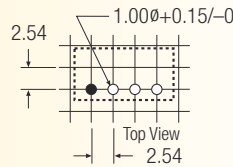
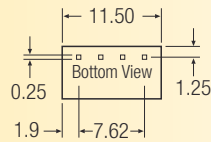


**Package Style and Pinning (mm)**

**4 PIN SIP Package**



**Recommended Footprint Details**

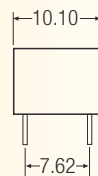
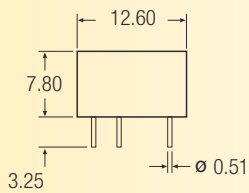


**RM Pin Connections**

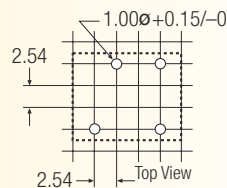
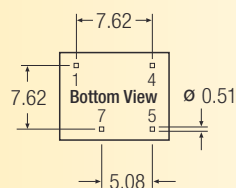
Pin #	Single
1	-Vin
2	+Vin
3	-Vout
4	+Vout

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