

# Features

## Unregulated Converters

- Ultra-compact - only 8.3 x 8.3 x 6.8mm
- 1kVDC or 2kVDC Isolation
- No External Components Required
- Optional Continuous Short Circuit Protected
- Fully Encapsulated
- UL and EN Certified, CB Report
- Efficiency to 84%

### Description

The RNM series DC/DC converters are ultra-compact isolated single output converters for applications where board space is at a premium. Despite their small size, the converters are fully featured with a full industrial operating temperature range of -40°C to +85°C without derating (+100°C with derating), 1kVDC or 2kVDC isolation and optional short circuit protection. The converters are also UL-60950 and EN-60950 certified and have a CB Report.

### Selection Guide

Part Number	Input Voltage (2kV)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)	Max. Capacitive Load <sup>(1)</sup>
RNM-xx3.3S	(H)	3.3, 5, 12, 15	3.3	303	75	2200µF
RNM-xx05S	(H)	3.3, 5, 12, 15	5	200	70-78	1000µF
RNM-xx09S	(H)	3.3, 5, 12, 15	9	111	70-78	1000µF
RNM-xx12S	(H)	3.3, 5, 12, 15	12	83	76-78	470µF
RNM-xx15S	(H)	3.3, 5, 12, 15	15	66	78-84	470µF

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

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

### Specifications (measured at T<sub>A</sub> = 25°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 V <sub>in</sub> typ.
Load Voltage Regulation (10% to 100% full load)	3.3V output type 5V output type 9V, 12V and 15V output types	20% max. 15% max. 10% max.
Output Ripple and Noise (20MHz limited)		100mVp-p max.
Operating Frequency		50kHz min. / 100kHz typ. / 105kHz max.
Efficiency at Full Load		70% min.
Minimum Load = 0%		Specifications valid for 10% minimum load only.
Isolation Voltage	(tested for 1 second) (rated for 1 minute)	1000VDC 500VAC / 60Hz
Isolation Voltage	H-Suffix (tested for 1 second)	2000VDC
Rated Working Voltage	H-Suffix (rated for 1 minute)	1000VAC / 60Hz
Isolation Capacitance		20pF min. / 75pF 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		1.1g
Packing Quantity		60 pcs per Tube
MTBF (+25°C)	Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F
(+85°C)		using MIL-HDBK 217F
		977 x 10 <sup>3</sup> hours
		189 x 10 <sup>3</sup> hours

# ECONOLINE

## DC/DC-Converter

with 3 year Warranty



# 1 Watt

# DIP6

# Single Output

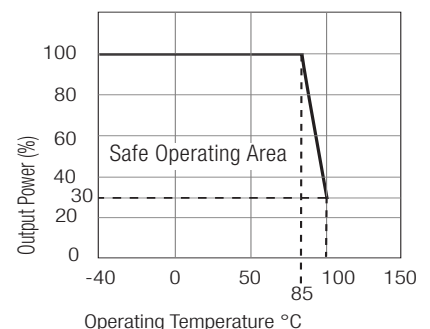


**UL-60950-1 Certified**  
**EN-60950-1 Certified**

# RNM

## Derating-Graph

(Ambient Temperature)



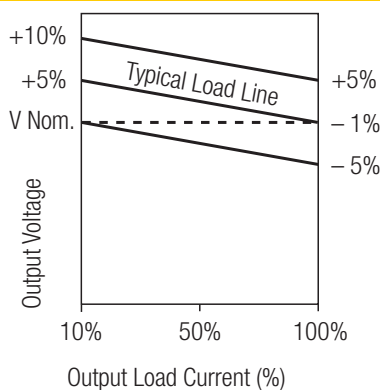
Refer to Application Notes

www.recom-electronic.com

## Specifications (cont.)

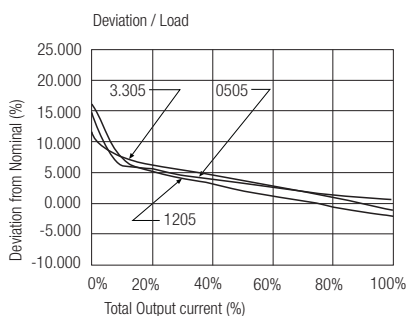
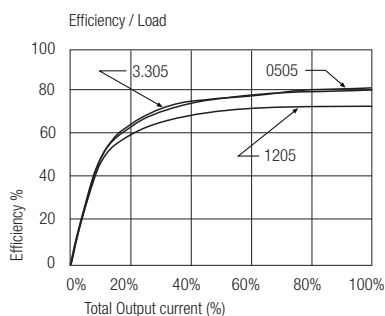
Notes		
Note 1	Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.	
Certifications		
CB Test Report	Report: US/15348/UL	IEC 60950-1:2005 2nd Ed.
UL General Safety	Report: E224736	UL 60950-1 1st Ed.
EN General Safety	Report: PS080804950	EN60950-1

## Tolerance Envelope

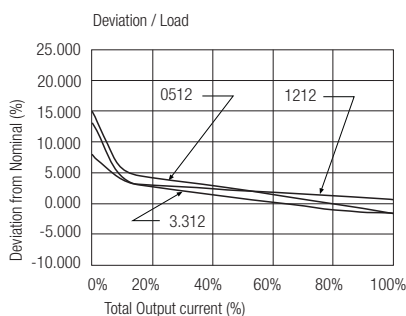
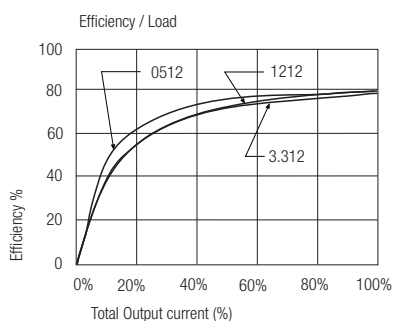


## Typical Characteristics

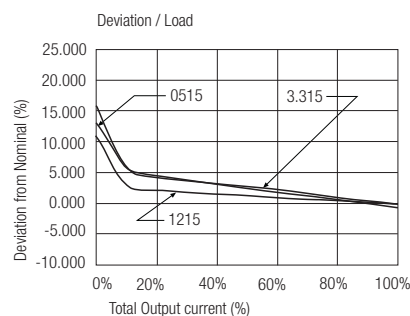
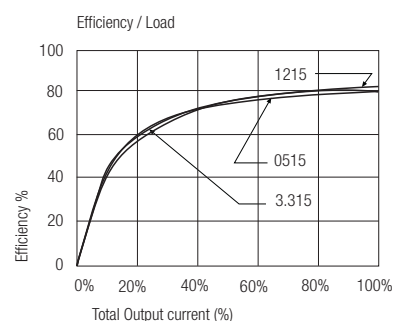
### RNM-xx05S



### RNM-xx12S



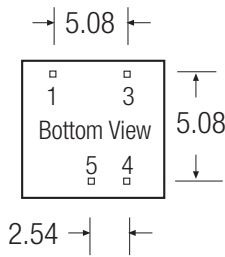
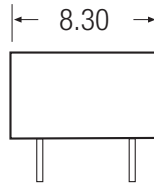
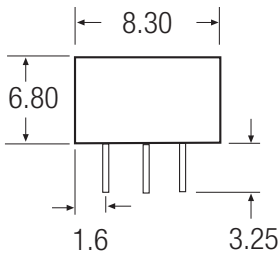
### RNM-xx15S



### Package Style and Pinning (mm)

4 PIN DIP Package

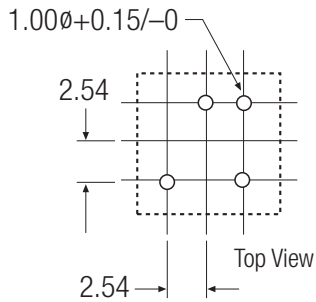
3rd angle projection 



#### RNM Pin Connections

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

XX.XX ± 0.25 mm



#### Recommended Footprint Details