

## 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 (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency (%) | Max. Capacitive Load <sup>(1)</sup> |
|-------------|-------|---------------------|----------------------|---------------------|----------------|-------------------------------------|
| DIP6        | (2kV) |                     |                      |                     |                |                                     |
| 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 Vin typ.                    |
| Load Voltage Regulation                           | 3.3V output type                                | 20% max.                               |
| (10% to 100% full load)                           | 5V output type                                  | 15% max.                               |
|                                                   | 9V, 12V and 15V output types                    | 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)                           | 1000VDC                                |
|                                                   | (rated for 1 minute**)                          | 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                        |

continued on next page

## ECONOLINE

### DC/DC-Converter

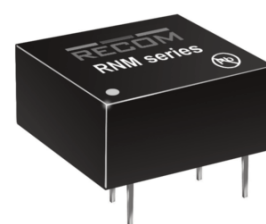
with 3 year Warranty

RECOM

1 Watt

DIP6

Single Output

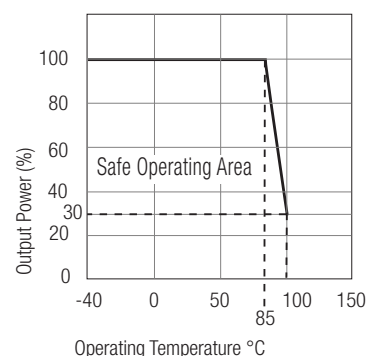


UL US  
E358085

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

RNM

## Derating-Graph (Ambient Temperature)



Refer to Application Notes

www.recom-power.com

\*\*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.

### Specifications (cont.)

|              |                                                              |                     |                             |
|--------------|--------------------------------------------------------------|---------------------|-----------------------------|
| MTBF (+25°C) | Detailed Information see<br>Application Notes chapter "MTBF" | using MIL-HDBK 217F | 977 x 10 <sup>3</sup> hours |
| (+85°C)      |                                                              | using MIL-HDBK 217F | 189 x 10 <sup>3</sup> hours |

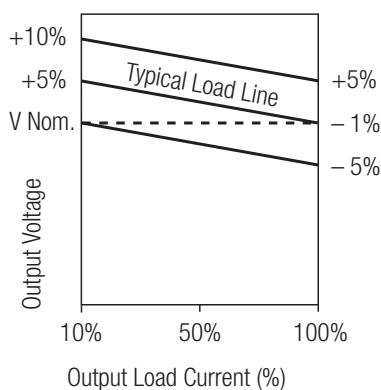
### Certifications

|                   |                       |                          |
|-------------------|-----------------------|--------------------------|
| CB Test Report    | Report: US/13859/UL   | IEC 60950-1:2005 2nd Ed. |
| UL General Safety | Report: E358085       | UL 60950-1 1st Ed.       |
| EN General Safety | Report: SPCLVD1109103 | EN60950-1:2006+A12:2011  |

### Notes

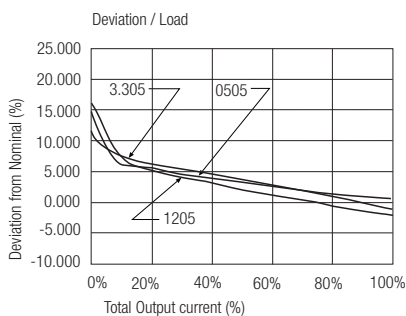
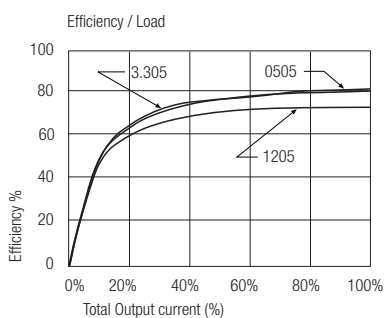
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Tolerance Envelope

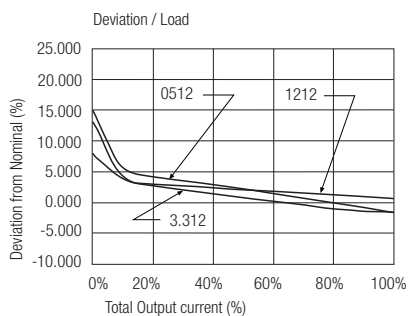
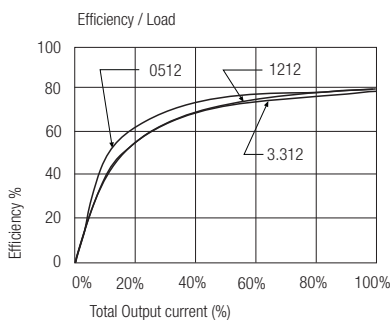


### Typical Characteristics

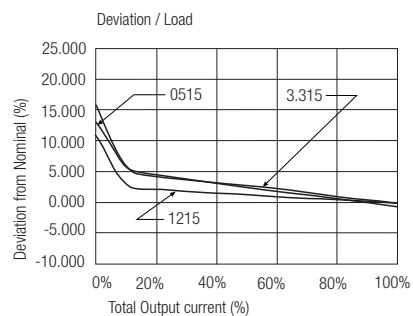
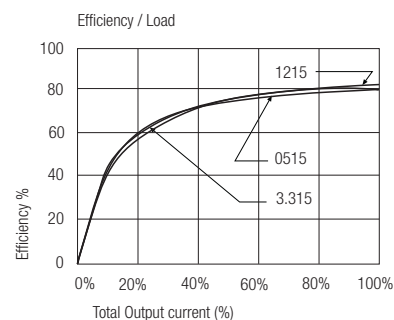
#### RNM-xx05S



#### RNM-xx12S

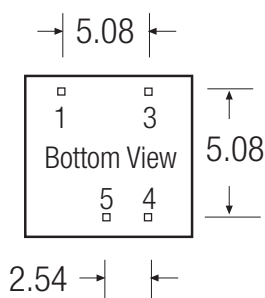
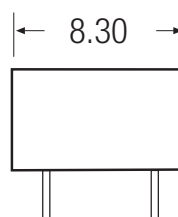
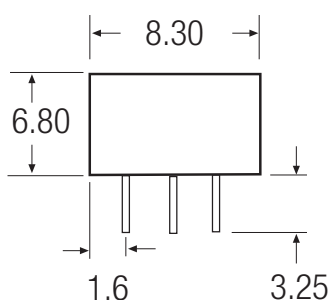


#### RNM-xx15S



### Package Style and Pinning (mm)

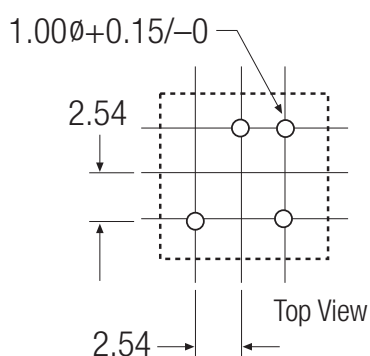
#### 4 PIN DIP Package



#### RNM Pin Connections

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

XX.XX ± 0.25 mm



#### Recommended Footprint Details