Features

Unregulated Converters

- Ultra-compact size - only 8.3 x 8.3 x 6.8mm
- 1kVDC/1s or 2KVDC/1s basic isolation
- Optional continuous short circuit protected
- Fully encapsulated
- UL and EN certified, CB report
- Efficiency to 84%

RECOM
DC/DC Converter

RNM

1 Watt DIP6 Single Output

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-60950-1 and EN-60950-1 certified and have a CB Report.



Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
RNM-xx3.3S (3,4)	3.3, 5, 12, 15	3.3	303	75	2200
RNM-xx05S (3,4)	3.3, 5, 12, 15	5	200	70-82	1000
RNM-xx09S (3,4)	3.3, 5, 12, 15	9	111	70-78	1000
RNM-xx12S (3,4)	3.3, 5, 12, 15	12	83	76-80	470
RNM-xx15S (3,4)	3.3, 5, 12, 15	15	66	78-84	470

Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: Max Cap Load is tested at nominal input and full resistive load and is defined as the capacitive load that will allow start up in under 1s without damage to the converter

UL60950-1 certified*
CAN/CSA-C22.2 No. 60950-1-07 certified*
IEC/EN60950-1 certified

Model Numbering

RNM- ___ ___ S/ ___ ___

- Input Voltage
- Output Voltage
- Protection (3)
- Isolation Option (4)
- **S**ingle

Notes:

Note3: standard part is without continuous short circuit protection
add suffix „/P“ for continuous short circuit protection

Note4: add suffix „/H“ for 2kVDC/1s isolation
or add suffix „/HP“ for continuous short circuit protection and 2kVDC/1s Isolation

Ordering Examples:

RNM-0505S/P: 5V Input Voltage, 5V Output Voltage, Single Output with continuous short circuit protection
RNM-0505S/HP: 5V Input Voltage, 5V Output Voltage, Single Output with 2kVDC/1s Isolation and continuous short circuit protection

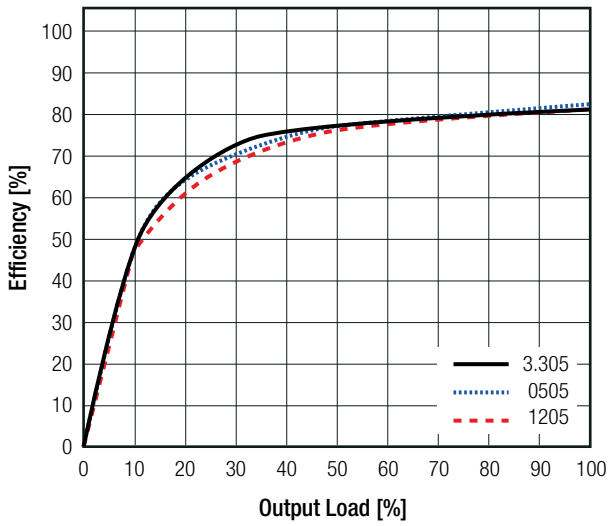
Specifications (measured @ Ta= 25°C, nom. Vin and full load otherwise stated)

BASIC CHARACTERISTICS

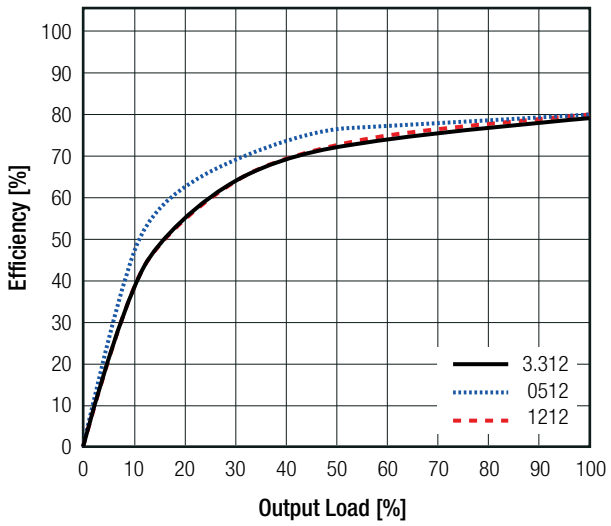
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load		0%		
Internal Operating Frequency		50kHz	100kHz	105kHz
Output Ripple and Noise	20MHz BW			100mVp-p

Efficiency vs. Load

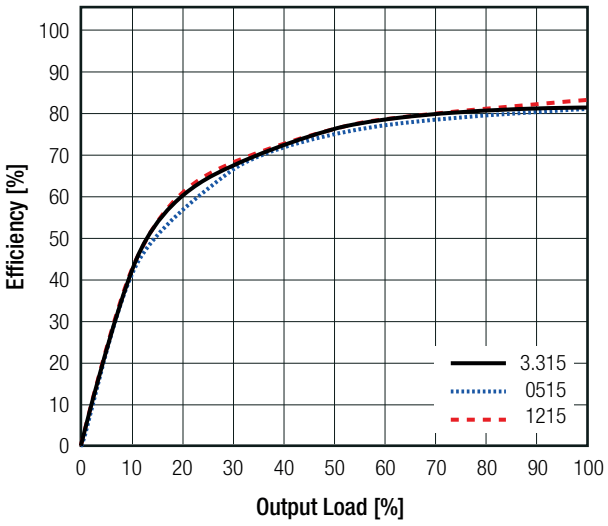
RNM-xx05S



RNM-xx12S



RNM-xx15S



REGULATIONS

Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line		±1.2% of 1.0% Vin typ.
Load Regulation [5]	10% to 100% load	3.3Vout	20.0% max.
		5Vout	15.0% max.
		9, 12, 15Vout	10.0% max.

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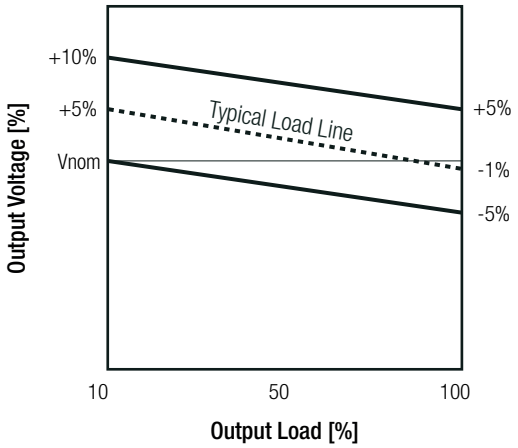
Specifications (measured @ Ta= 25°C, nom. Vin and full load otherwise stated)

Notes:

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

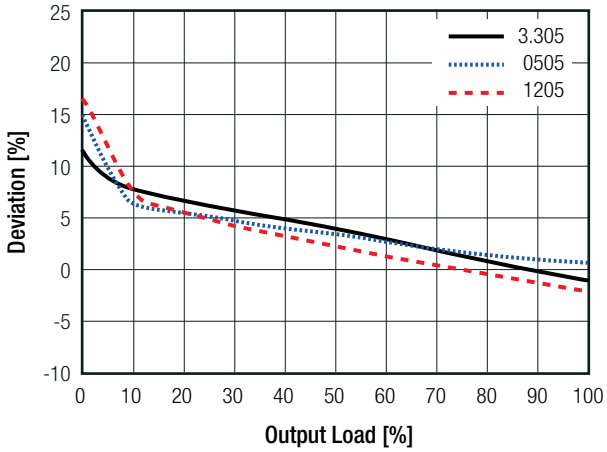
Tolerance Envelope

9, 12 and 15Vout

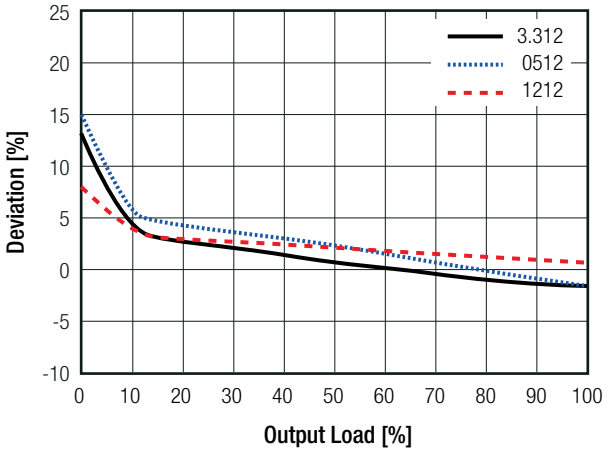


Deviation vs. Load

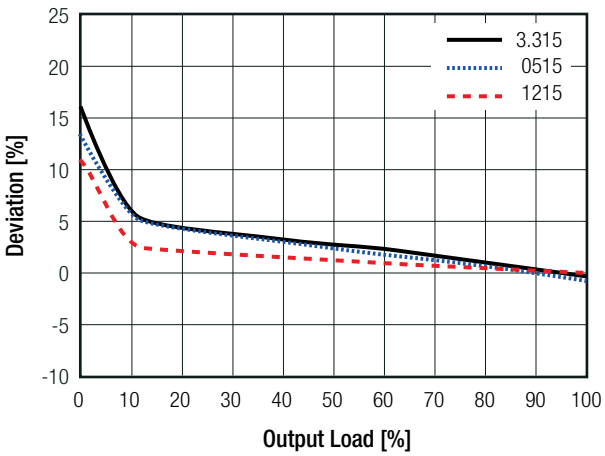
RNM-xx05S



RNM-xx12S



RNM-xx15S



Specifications (measured @ Ta= 25°C, nom. Vin and full load otherwise stated)

PROTECTIONS

Parameter	Type			Value
Short Circuit Protection (SCP)	without suffix with suffix "/P"			1 second continuous
Isolation Voltage [6]	I/P to O/P	without suffix	tested for 1 second rated for 1 minute	1kVDC 500VAC/60Hz
		with suffix "/H"	tested for 1 second rated for 1 minute	2kVDC 1kVAC/60Hz
Isolation Resistance				10GΩ min.
Isolation Capacitance				20pF min. / 75pF max.
Insulation Grade				basic (IEC/EN60950-1) functional (UL60950-1)

Notes:

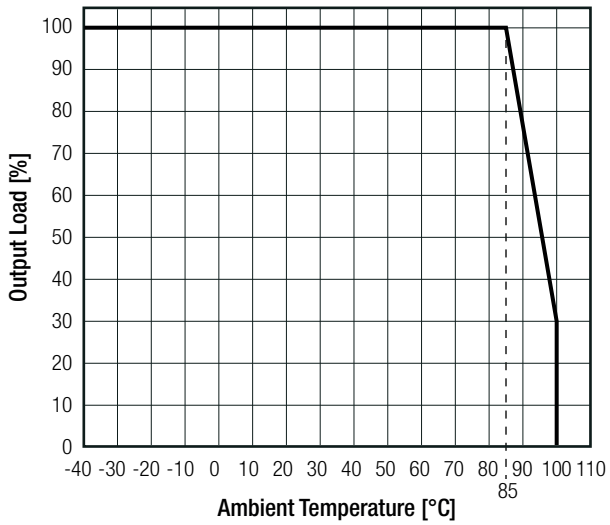
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note7: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection (see graph)		-40°C to +85°C
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +85°C	22900 x 10^3 hours 9100 x 10^3 hours

Derating Graph
(@ free air convection)



Specifications (measured @ Ta= 25°C, nom. Vin and full load otherwise stated)

SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety [8]	E358085	UL60950-1, 2nd Edition:2007 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition:2007
Information Technology Equipment, General Requirements for Safety	1602031	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety [8] (CB Scheme)	US-13859-UL	IEC60950-1:2005, 2nd Edition
EAC	RU-AT.49.09571	TP TC 004/2011
RoHs 2+		RoHS-2011/65/EU + AM-2015/863

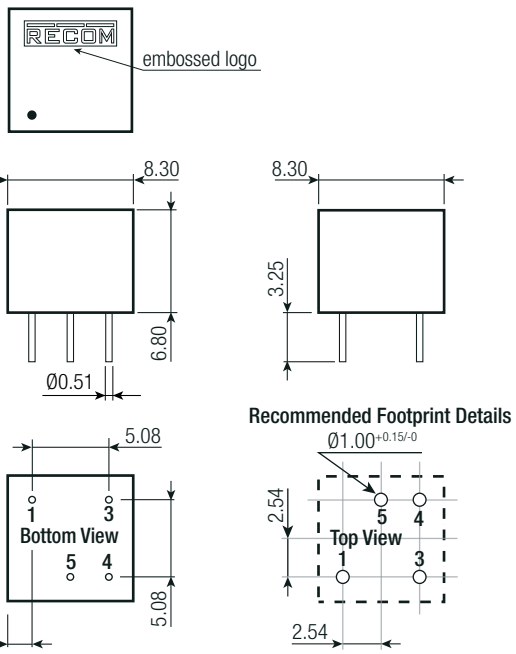
Notes:

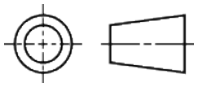
Note8: suffix "/P" excluded

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB	non-conductive black plastic, (UL94 V-0) epoxy, (UL94 V-0) FR4, (UL94 V-0)
Dimension (LxWxH)		8.3 x 8.3 x 6.8mm
Weight		1.1g typ.

Dimension Drawing (mm)





Pinning information

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

Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	530.0 x 14.0 x 10.0mm
Packaging Quantity		60pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.

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