

# Features

# Unregulated Converters

- Single output rail
- Industry standard pinout
- 1kVDC/1s or 2kVDC/1s basic isolation
- High efficiency for low power applications
- UL94V-0 package material
- Optional continuous short circuit protection
- Fully encapsulated
- Efficiency up to 76%



# RM

**0.25 Watt**  
**SIP4**  
**Single Output**



## Description

The RM series DC/DC converter has been designed for isolating or converting DC power rails with very light loads. Efficiencies are typically 10% higher than a comparable 0.5W or 1W converters run at the same low load.

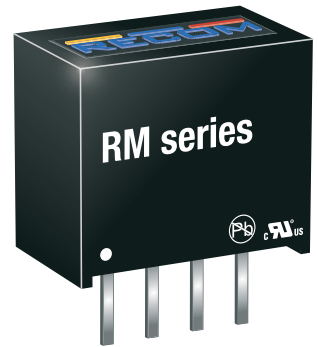
## Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	max. Capacitive Load <sup>(2)</sup> [µF]
RM-xx3.3S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	3.3	75	62-70	1000
RM-xx05S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	5	50	66-72	470
RM-xx09S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	9	28	70-72	470
RM-xx12S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	12	21	70-72	150
RM-xx15S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	15	17	70-76	150

### Notes:

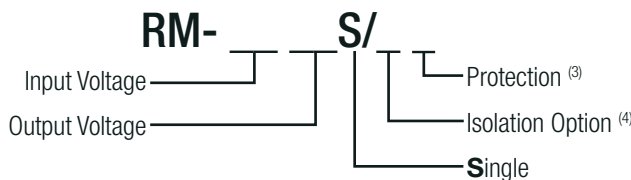
Note1: Efficiency is tested at nominal input and full load at +25°C ambient

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. 60950-1-03 certified  
IEC60950-1 certified  
EN60950-1 certified  
EN55032 compliant

## Model Numbering



### 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:

RM-1205S/P: 12V Input Voltage, 5V Output Voltage, Single Output with continuous short circuit protection

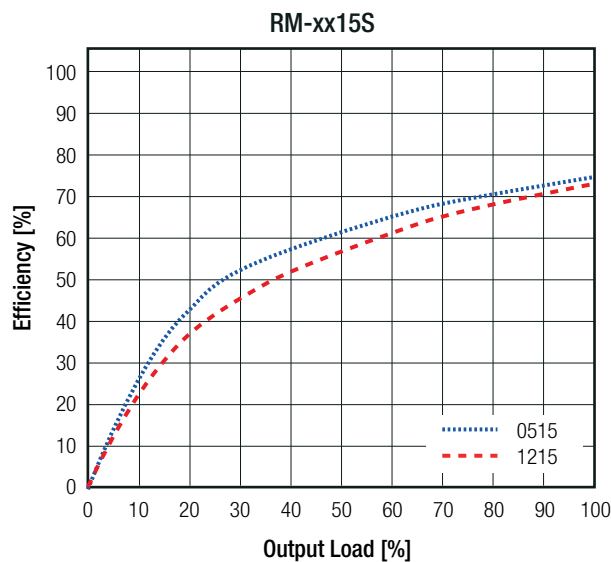
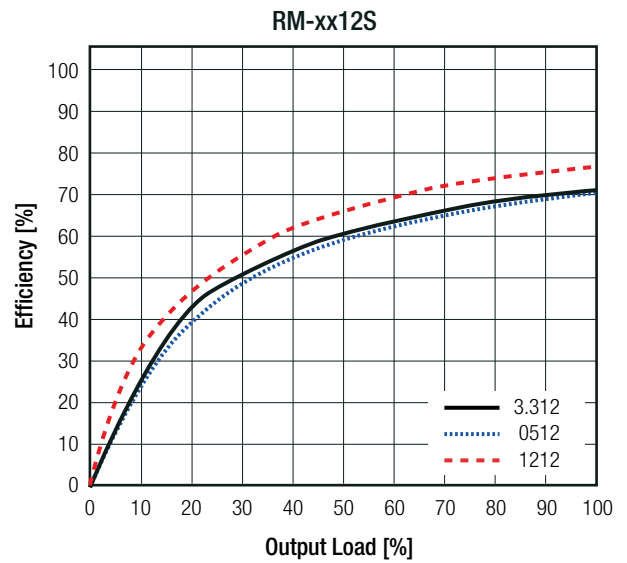
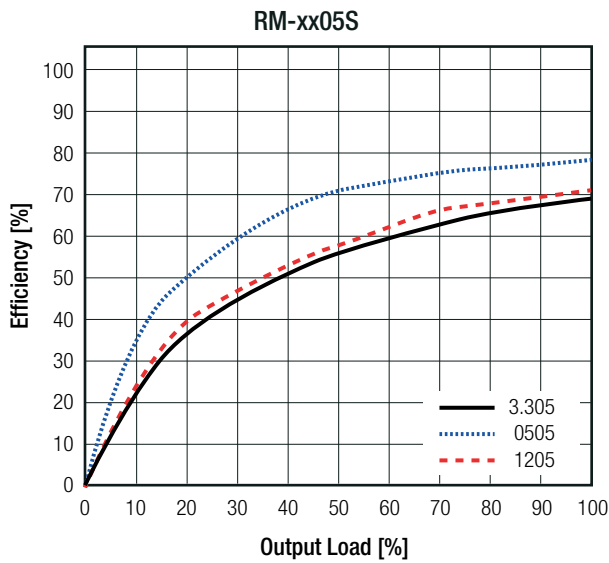
RM-0505S/HP: 5V Input Voltage, 5V Output Voltage, Single Output with 2kVDC/1s isolation and continuous short circuit protection

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm up unless otherwise stated)

### BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load		0%		
Internal Operating Frequency		50kHz	90kHz	105kHz
Output Ripple and Noise	20MHz BW			50mVp-p

### Efficiency vs. Load



### REGULATIONS

Parameter	Condition	Value
Output Accuracy		±5.0% max.
Line Regulation	low line to high line	±1.2% of 1.0% Vin typ.

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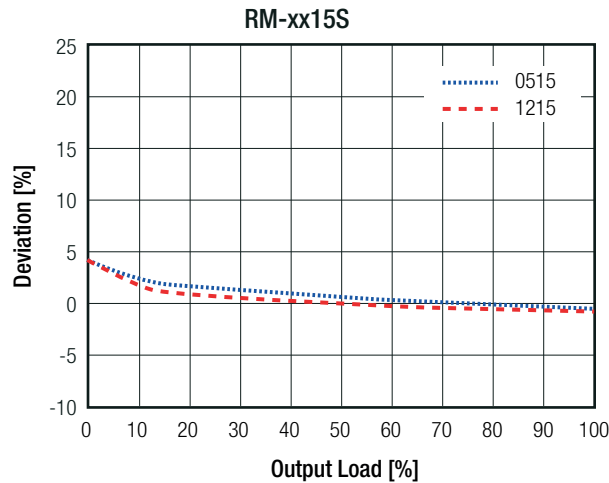
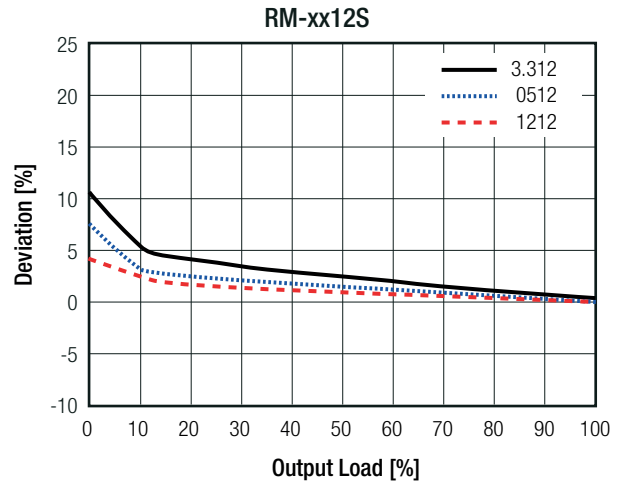
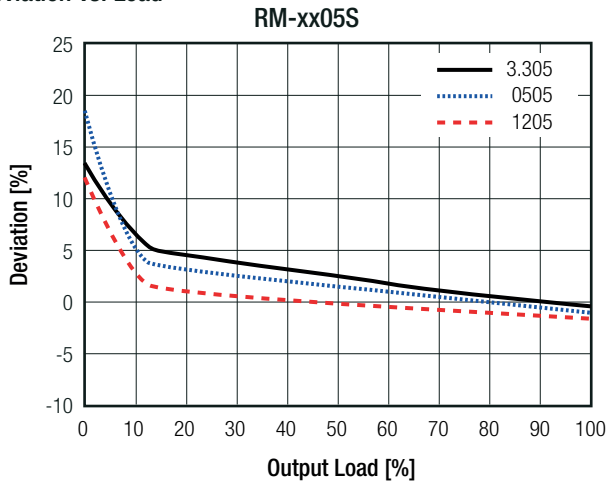
### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm up unless otherwise stated)

Parameter	Condition		Value
Load Regulation <sup>(5)</sup>	10% to 100% load	3.3Vout	20.0% max.
		5Vout	15.0% max.
		12, 15, 24Vout	10.0% max.

**Notes:**

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

**Deviation vs. Load**



### PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	without suffix		1 second
	with suffix "/P"		continuous
Isolation Voltage <sup>(6)</sup>	I/P to O/P	without suffix	1kVDC 500VAC/60Hz
		with suffix "/H"	2kVDC 1.4kVAC/60Hz
Isolation Resistance			10GΩ min.
Isolation Capacitance			25pF min. / 82pF max.
Insulation Grade			basic

**Notes:**

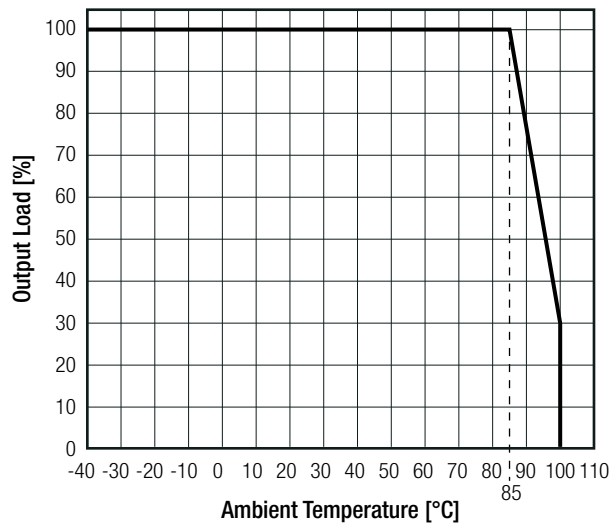
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note7: Refer to local wiring regulations if input over-current protection is also required. Recommended fuse: T0.5A slow blow type

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm up unless otherwise stated)

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	1327 x 10 <sup>3</sup> hours
		+85°C	302 x 10 <sup>3</sup> hours

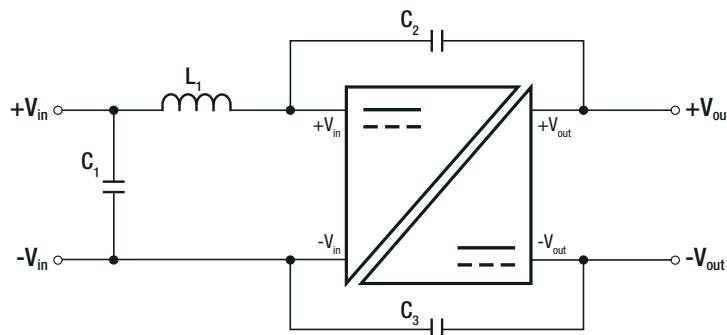
**Derating Graph**  
(@ free air convection)



SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	SPCLVD1602031	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety	E358085-A4-UL	UL60950-1, 2nd Edition:2007 CAN/CSA C22.2 No. 60950-1-03, 2nd Edition:2007
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS 2+		RoHS-2011/65/EU + AM-2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter (see filter suggestion below)	EN55032, Class B EN55032, Class A

**EMC Filter Suggestion according to EN55032**



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**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm up unless otherwise stated)

Component List Class A					Component List Class B				
MODEL	C1	L1	C2 (safety)	C3 (safety)	MODEL	C1	L1	C2 (safety)	C3 (safety)
RM-0505S	10µF 100V MLCC	N/A	N/A	N/A	RM-0505S	10µF 100V MLCC	22µH choke RLS-226	1nF	2.2nF
RM-1205S				2.2nF	RM-1205S				
RM-2405S				N/A	RM-2405S				

**Notes:**  
 Note8: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact RECOM tech support for advice

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)		11.5 x 6.0 x 10.0mm
Weight		1.4g typ.

**Dimension Drawing (mm)**

embossed logo

Marking

Recommended Footprint Details

Top View

Bottom View

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

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

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	520.0 x 16.0 x 9.0mm
Packaging Quantity	tube	42pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.

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