

Features

Unregulated Converters

- Single output rail
- Industry standard pinout
- 1kVDC 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

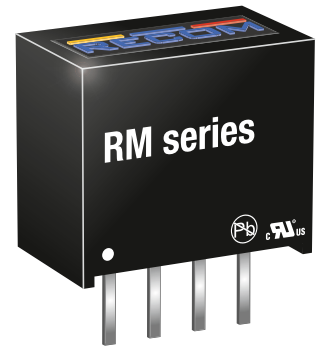
The RM series DC/DC converter has been designed for isolating or converting DC power rails with very light loads. Efficiencies are typically 10% higher than a comparable 0.5W or 1W converters run at the same low load.

Selection Guide

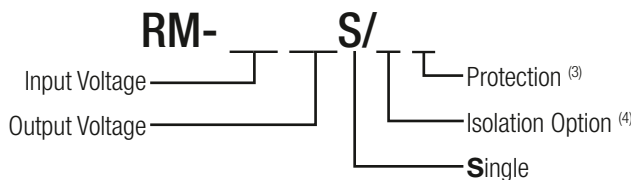
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [µF]
RM-xx3.3S ^(3,4)	3.3, 5, 12, 15, 24	3.3	75	62-70	1000
RM-xx05S ^(3,4)	3.3, 5, 12, 15, 24	5	50	66-72	470
RM-xx09S ^(3,4)	3.3, 5, 12, 15, 24	9	28	70-72	470
RM-xx12S ^(3,4)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



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 isolation
 or add suffix „HP“ for continuous short circuit protection and 2kVDC 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 Isolation and continuous short circuit protection

UL60950-1 certified
 CAN/CSA-C22.2 No. 60950-1-03 certified
 IEC60950-1 certified
 EN60950-1 certified
 EN55032 compliant

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

BASIC CHARACTERISTICS

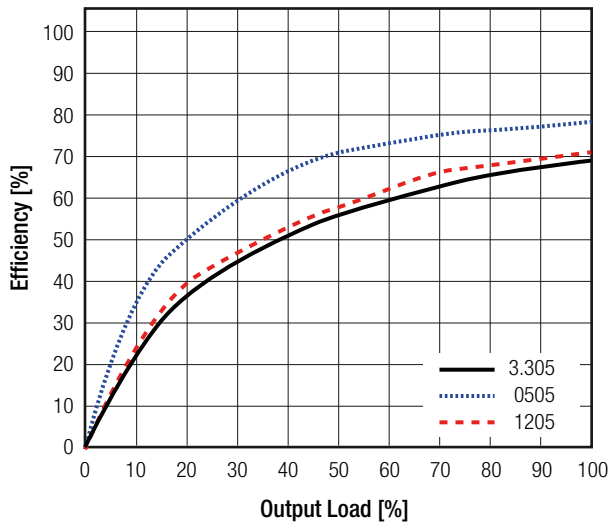
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load ⁽⁵⁾		0%		
Internal Operating Frequency		50kHz	90kHz	105kHz
Output Ripple and Noise	20MHz BW			50mVp-p

Notes:

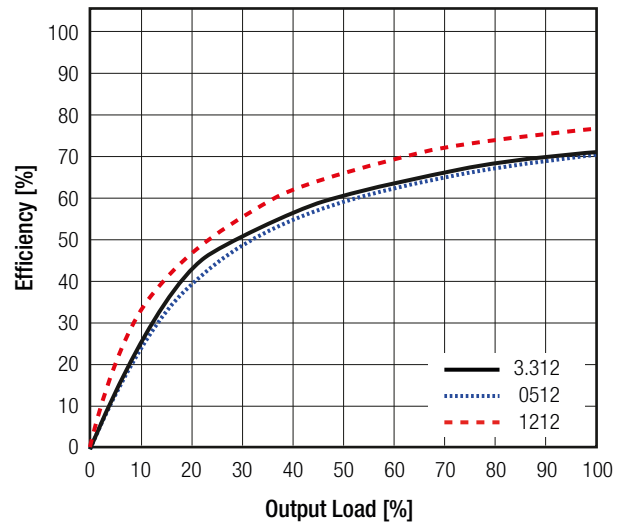
Note5: Operation below 10% load will not harm the converter, but specifications may not be met

Efficiency vs. Load

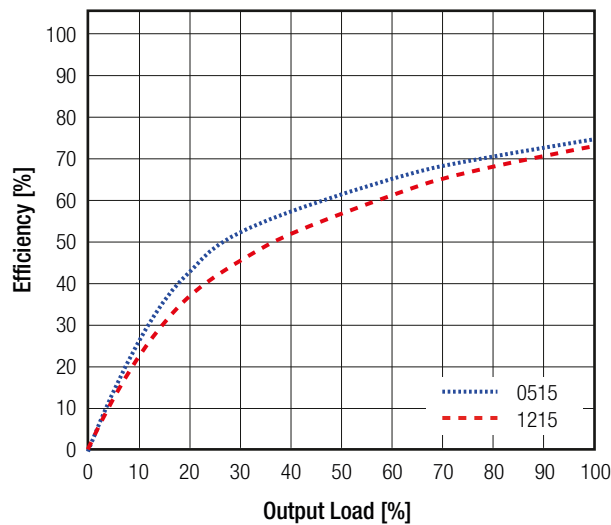
RM-xx05S



RM-xx12S



RM-xx15S

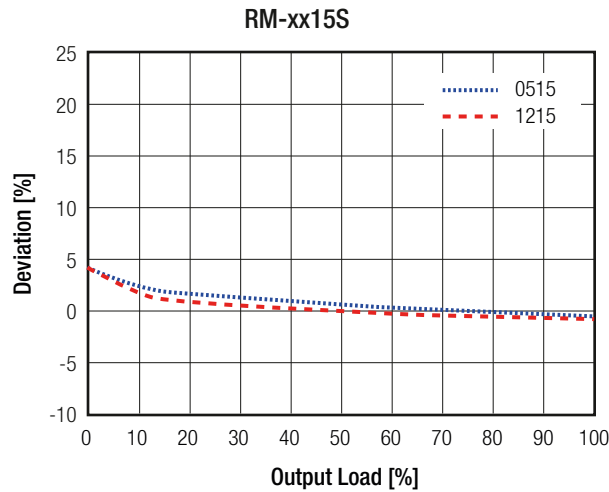
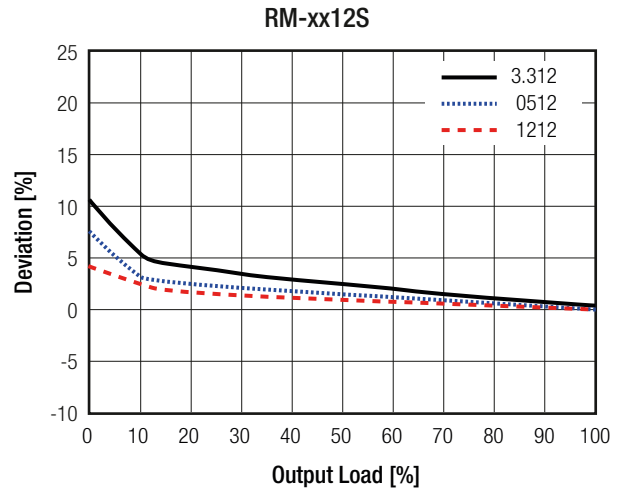
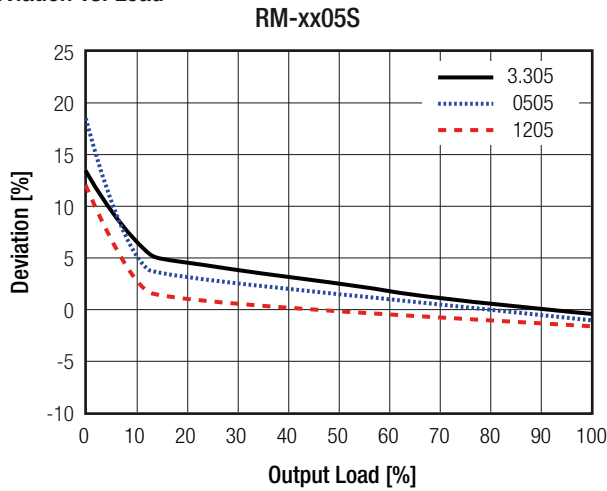


Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm up unless otherwise stated)

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	10% to 100% load	3.3Vout	20.0% max.
		5Vout	15.0% max.
		12, 15, 24Vout	10.0% max.

Deviation vs. Load



PROTECTIONS

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

Notes:

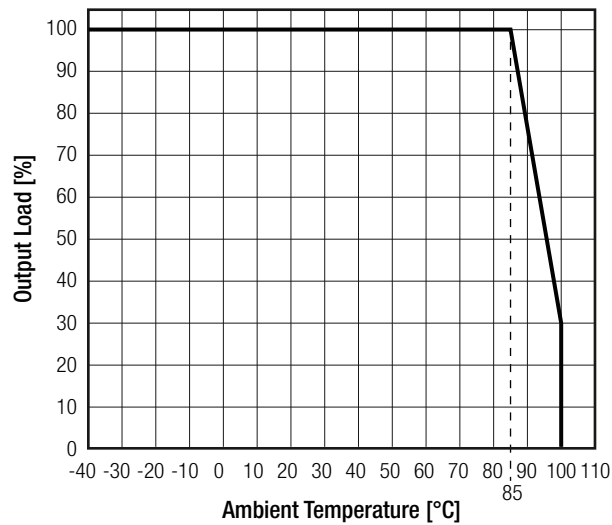
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

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 ³ hours
		+85°C	302 x 10 ³ hours

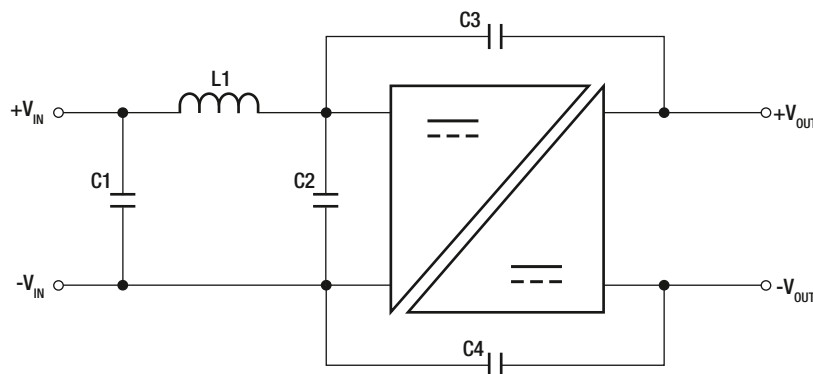
Derating Graph
(@ free air convection)



SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
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	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
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	with external filter	EN55032, Class B

EMC Filtering Suggestions according to EN55032



continued on next page

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	C2	C4 (safety)	Model	L1	C1	C3 (safety)	C4(safety)
3.3, 5Vin	10µF	N/A	-	all types	22µH choke RP4532Z-220K	10µF MLCC, 100V	1nF 5KV, Johanson	2.2nF 5KV, Johanson
12, 15, 24Vin	100V, MLCC		2.2nF, 5KV, Johanson					

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)

Pinning information

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		95% RH max.

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.

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