

Features

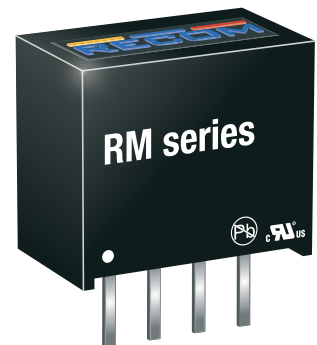
Unregulated Converters

- 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%

RECOM
DC/DC Converter

RM

0.25 Watt
SIP4
Single Output



UL
E358085



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

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

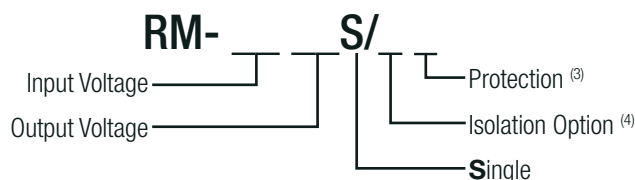
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [μF]
RM-xx3.3S ^(3,4)	3.3, 5, 12, 15, 24	3.3	75	62-70	1000
RM-xx05S ^(3,4)	3.3, 5, 12, 15, 24	5	50	66-72	470
RM-xx09S ^(3,4)	3.3, 5, 12, 15, 24	9	28	70-72	470
RM-xx12S ^(3,4)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

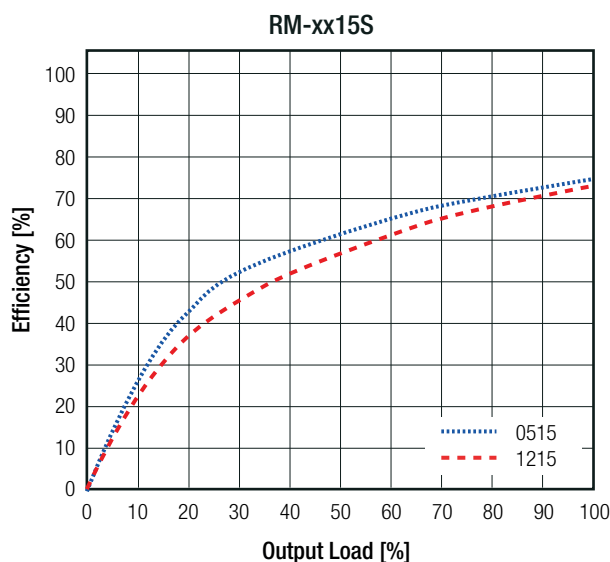
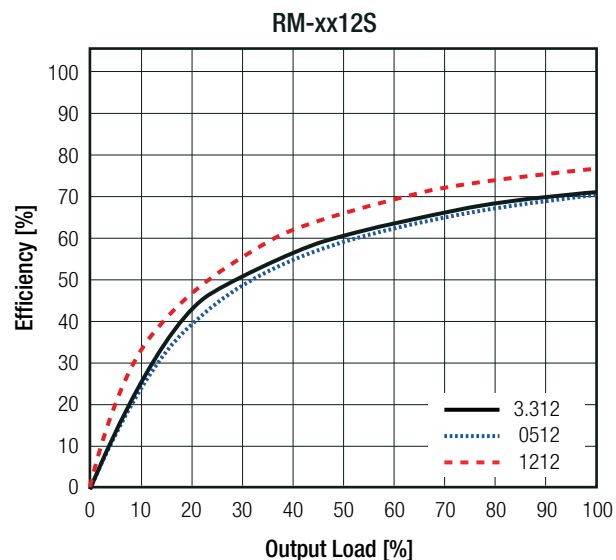
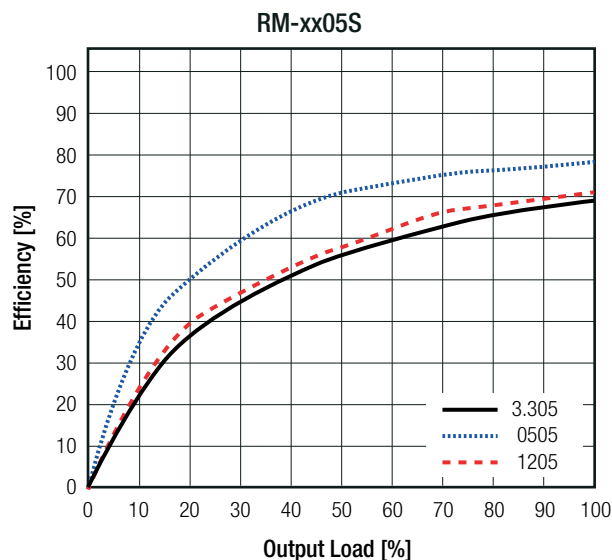
RM-0505S/HP: 5V Input Voltage, 5V Output Voltage, Single Output with 2kVDC/1s isolation and continuous short circuit protection

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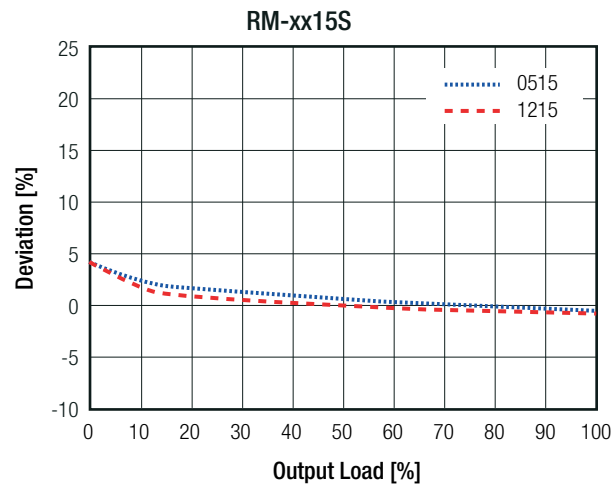
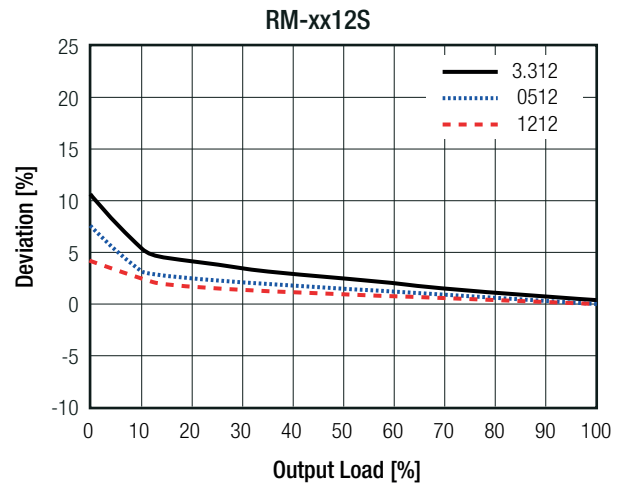
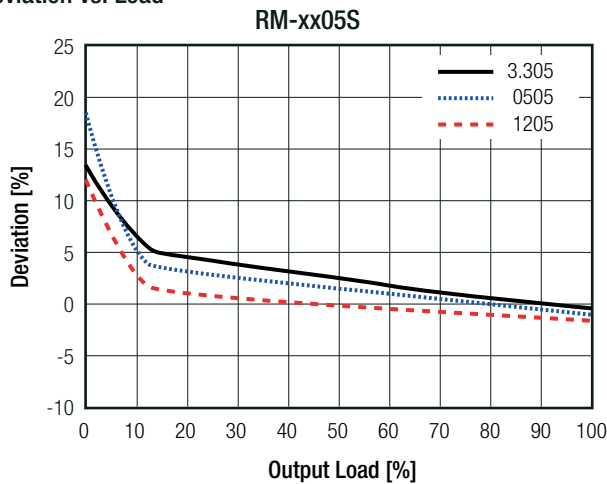
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm up unless otherwise stated)

Parameter	Condition		Value
Load Regulation ⁽⁵⁾	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 ⁽⁶⁾	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

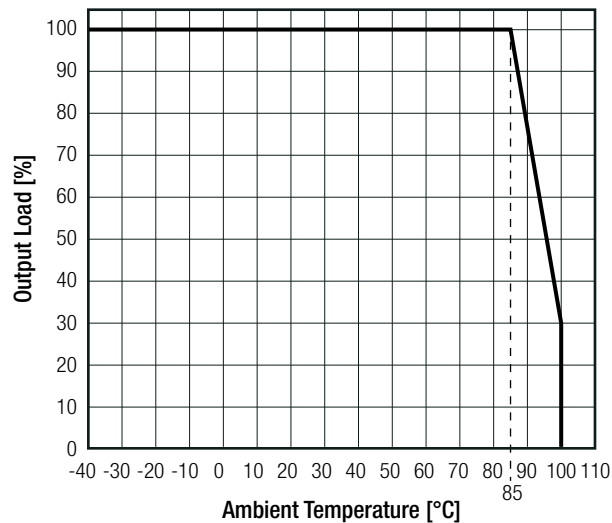
Specifications (measured @ $T_a = 25^\circ\text{C}$, nom. V_{in} , full load and after warm up unless otherwise stated)

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection (see graph)		-40°C to $+85^\circ\text{C}$
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	$+25^\circ\text{C}$	1327×10^3 hours
		$+85^\circ\text{C}$	302×10^3 hours

Derating Graph

(@ free air convection)

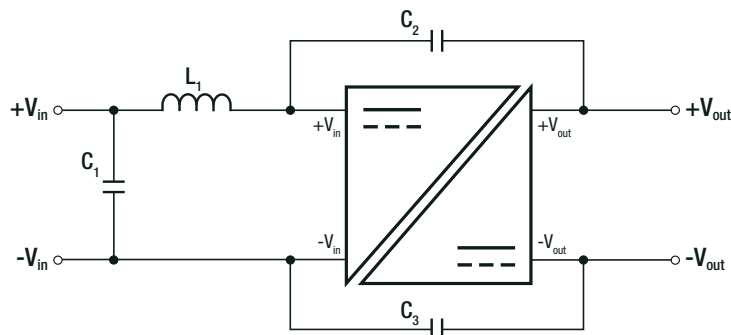


SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	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

MODEL	C1	L1	C2 (safety)	C3 (safety)
RM-0505S	10µF 100V MLCC	N/A	N/A	N/A
RM-1205S				2.2nF
RM-2405S				N/A

Component List Class B

MODEL	C1	L1	C2 (safety)	C3 (safety)
RM-0505S	10µF 100V MLCC	22µH choke RLS-226	1nF	2.2nF
RM-1205S				
RM-2405S				

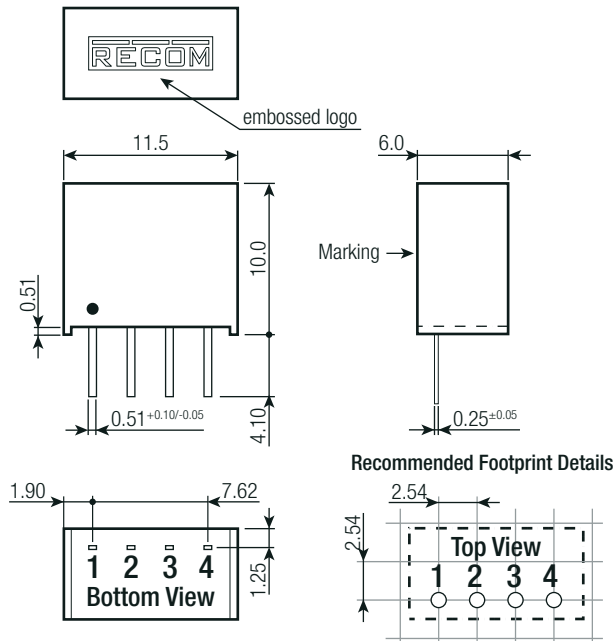
Notes:

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)



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	non-condensing	95% RH max.

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