Features

Regulated Converters

- 1W power in SMD package
- 4:1 Input voltage range
- Efficiency up to 81%
- 1.6kVDC/1min isolation
- Regulated output
- -40°C to +90°C at full load
- Continuous short circuit protected

Description

The R1M is an isolated 1W DC/DC converter in a compact SMD package available with 4:1 inputs covering 5, 12, 24, and 48V rails providing single or dual regulated, short-circuit protected outputs. There is no minimum load requirement. Isolation is 1.6kVDC/1min, and the operating temperature is from -40°C up to +90°C without derating. Class A and Class B EMC conformity requires only a few external components. Standard packaging is tube.

Selection Guide					
Part Number	Input Voltage Range ⁽¹⁾ [VDC]	nom. Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽²⁾ [%]	max. Capacitive Load ⁽³⁾ [μF]
R1M-xx3.3S/SMD	4.5-18, 9-36, 18-75	3.3	300	75-77	1680
R1M-xx05S/SMD	4.5-18, 9-36, 18-75	5	200	78-79	820
R1M-xx09S/SMD	4.5-18, 9-36, 18-75	9	112	79	630
R1M-xx12S/SMD	4.5-18, 9-36, 18-75	12	90	81	470
R1M-xx15S/SMD	4.5-18, 9-36, 18-75	15	70	81	330
R1M-xx24S/SMD	4.5-18, 9-36, 18-75	24	45	80	160
R1M-xx05D/SMD	4.5-18, 9-36, 18-75	±5	±100	77	±470
R1M-xx12D/SMD	4.5-18, 9-36, 18-75	±12	±45	80	±330
R1M-xx15D/SMD	4.5-18, 9-36, 18-75	±15	±35	81	±220

Notes:

Note1: Refer to "Input Voltage Range"

Note2: Efficiency is tested at nominal input and full load at +25°C ambient Note3: Max Cap Load is tested at nominal input and full resistive load

nom. Input Voltage nom. Output Voltage Single/Dual

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

BASIC CHARACTERISTICS						
Parameter	Con	Condition		Тур.	Max.	
	nom. V _⊪	_N = 12VDC	4.5VDC	12VDC	18VDC	
Input Voltage Range	nom. V _{IN} = 24VDC		9VDC	24VDC	36VDC	
	nom. V _{IN} = 48VDC		18VDC	48VDC	75VDC	
Input Surge Voltage		nom. V _{IN} = 12VDC			25VDC	
	1 second max.	nom. V _{IN} = 24VDC			50VDC	
		nom. V _{IN} = 48VDC			100VDC	
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R₁M

1 Watt SMD Single & Dual Output









Series

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

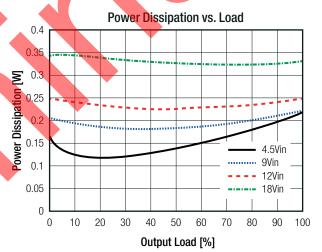
BASIC CHARACTERISTICS					
Parameter	Cor	ndition	Min.	Тур.	Max.
	nom. V	N= 12VDC		20mA	
Quiescent Current	nom. V	_N = 24VDC		10mA	
	nom. V	_N = 48VDC		5mA	
Start-up time	power up,	power up, CTRL ON/OFF			20ms
ON/OFF CTRL (4)	DC-DC ON		open or high impedance		
	DC-DC OFF		2mA	3mA	4mA
Standby Current	DC-	DC-DC OFF		2.5mA	
Internal Operating Frequency					
Output Ripple and Noise	201	20MHz BW		30mVp-p	
Reflected Back Ripple Current	with external components	nom. V _{IN} = 12VDC		15mAp-p	
		nom. V _{IN} = 24VDC		10mAp-p	
		nom. V _{IN} = 48VDC		5mAp-p	

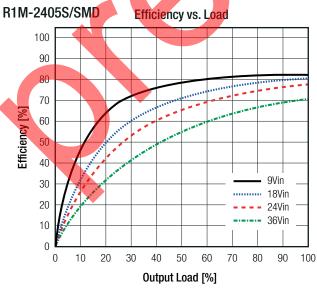
Notes:

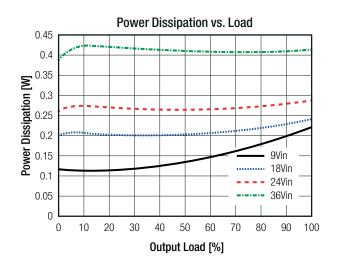
Note4: Refer to "ON/OFF CTRL"

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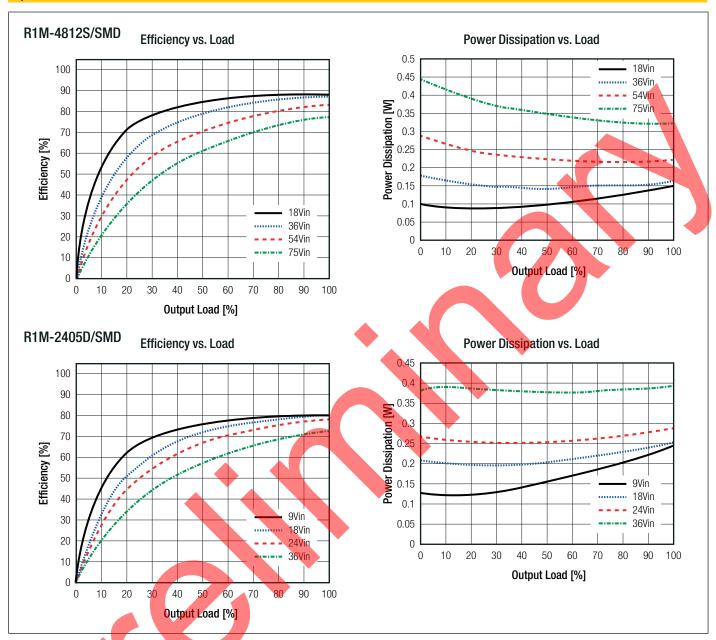


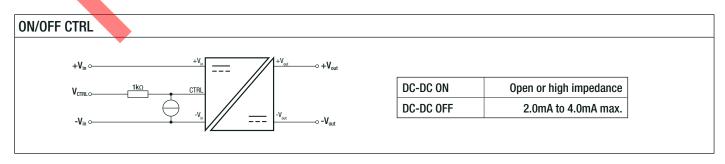
REV.: 0/2022 ECO-2



Series

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







Series

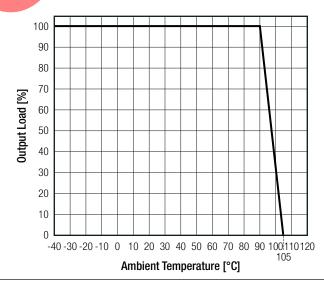
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

REGULATIONS			
Parameter	Conc	lition	Value
Output Accuracy			±1.0% max.
Line Regulation	low line to hig	h line, full load	±0.2% max.
	0% to 100% load	single	1% max.
Load Regulation		dual	1% max.
Load Negulation	10% to 100% load	single	0. <mark>5% max</mark> .
	10% to 100% toau	dual	0.8% max.
Cross Regulation	asymmetrical 2	5% / 100% load	±5% max.
Transient Response Recovery Time	25% load s	step change	±500µs typ.

PROTECTIONS					
Parameter	Ту	/ pe			Value
Short Circuit Protection (SCP)					continuous, auto recovery
Isolation Voltage (5)	I/P to O/P	1 minute			1.6kVDC
Isolation Resistance	I/P to O/P, V	/ _{ISO} = 500VDC			1G Ω min.
Isolation Capacitance	I/P to O/P, 1	100kHz/0.1V			50pF typ.
Notes:					
Note5: This power module is not internally fused. An input line fuse must always be used					
Recom suggests: 12Vin=T0.5A: 24Vin=T0.315A: 48Vin=T0.16A slow blow					

ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Dange	with derating	-40°C to +105°C
Operating Temperature Range	without derating	-40°C to +90°C
Maximum Case Temperature	measured at "tc point"	+105°C
Operating Humidity	non-condensing	5% - 95% RH max.
Thermal Shock		according to MIL-STD-810F
Vibration		according to MIL-STD-810F
MTBF	according to MIL-HDBK-217F, G.B. +25°C	8534 x 10 ³ hours

Derating Graph (@ Chamber and natural convection 0.1m/s)



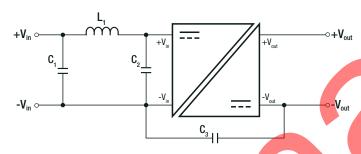


Series

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

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	File Number	Standard
RoHS2		RoHS-2011/65/EU + AM-2015/863
EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements	with external filter refer to "EMC Filtering"	EN55032, Class A and B

EMC Filtering Suggestions according to EN55032

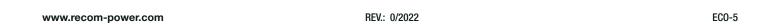


Class A Component List

Model	C1	C2	C3	L1
R1M-12xxS	10μF	N/A	N/A	4.7µH
R1M-24xxS	4.7µF	N/A	N/A	22μΗ
R1M-48xxS	2.2µF	N/A	150pF	39µH

Class B Component List

Model	C1, C2	C3	L1
R1M-12xxS	10μF	100pF	4.7µH
R1M-24xxS	4.7µF	150pF	22µH
R1M-48xxS	2.2µF	150pF	39µH

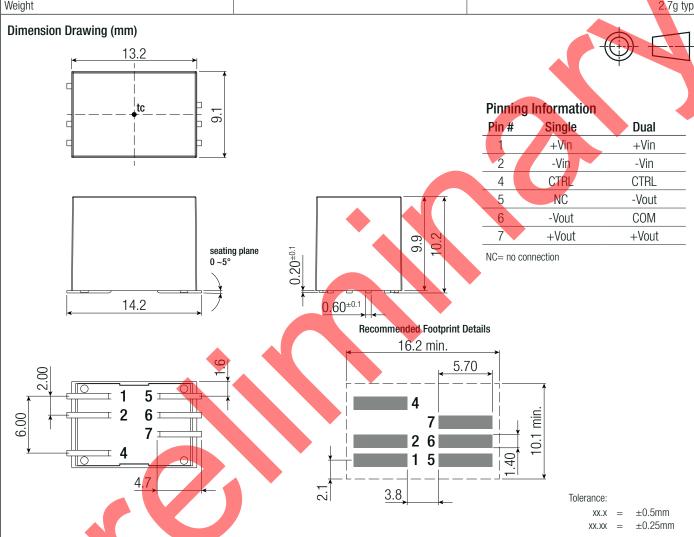




Series

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

DIMENSION AND PHYSICAL CHARACTERISTICS				
Parameter	Туре	Value		
Material	baseplate/case	black plastic, (UL94 V-0)		
	potting	silicone (UL94 V-0)		
Dimension (LxWxH)		14.2 x 9.1 x 10.2mm		
Weight		2. 7g typ.		
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PACKAGING INFORMATION		
Parameter	Туре	Value
Packaging Dimension (LxWxH)	tube	218.0 x 17.2 x 19.9mm
Packaging Quantity		20pcs
Storage Temperature Range	non-condensing	-50°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.

Mouser Electronics

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RECOM:

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 R1M-1212S/SMD
 R1M-1215D/SMD

 R1M-4815S/SMD
 R1M-4824S/SMD
 R1M-483.3S/SMD
 R1M-4805D/SMD
 R1M-4805S/SMD
 R1M-4809S/SMD
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