chanhvinh.com

Features

Regulated Converters

- 5W power in SMD package
- 4:1 Input voltage range
- Efficiency up to 86%
- 1.6kVDC/1min isolation
- Regulated output
- -40°C to +50°C at full load
- Continuous short circuit protected

RECOM
DC/DC Converter

R5M

5 Watt SMD Single & Dual Output

3 YEAR warranty



Description

The R5M is an isolated 5W DC/DC converter in a compact SMD package available with 4:1 inputs covering 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 +50°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]
R5M-xx3.3S/SMD	9-36, 18-75	3.3	1000	77	4400
R5Mxx05S/SMD	9-36, 18-75	5	1000	81	2200
R5Mxx09S/SMD	9-36, 18-75	9	555	82	1470
R5M-xx12S/SMD	9-36, 18-75	12	420	84-85	1220
R5M-xx15S/SMD	9-36, 18-75	15	333	85-86	1000
R5M-xx24S/SMD	9-36, 18-75	24	210	82	470
R5M-xx05D/SMD	9-36, 18-75	±5	±500	82	±1000
R5M-xx12D/SMD	9-36, 18-75	±12	±210	84	±680
R5M-xx15D/SMD	9-36, 18-75	±15	±168	85	±440

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

Model Numbering

R5M-__ __ __/SMD

- nom. Input Voltage
- nom. Output Voltage
- Case Style
- **S**ingle/**D**ual

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	nom. V_{IN}= 24VDC		9VDC	24VDC	36VDC
	nom. V_{IN}= 48VDC		18VDC	48VDC	75VDC
Input Surge Voltage	1 second max.	nom. V_{IN}= 24VDC			50VDC
		nom. V_{IN}= 48VDC			100VDC

continued on next page

chanhvinh.com

RECOM

DC/DC Converter

R5M Series

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

BASIC CHARACTERISTICS

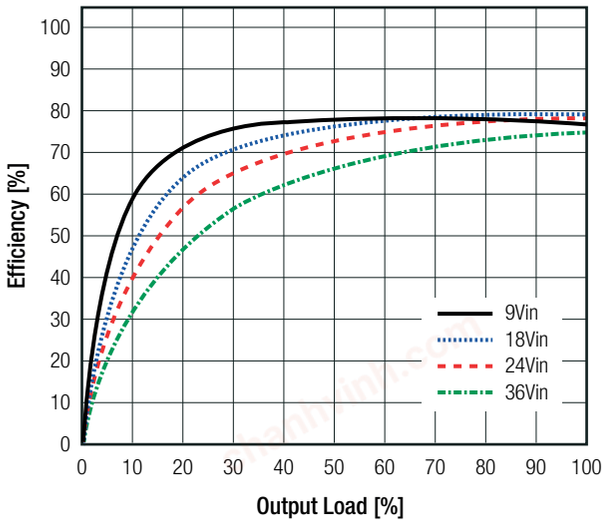
Parameter	Condition		Min.	Typ.	Max.
Quiescent Current	nom. V_{IN}= 24VDC			30mA	
	nom. V_{IN}= 48VDC			15mA	
Start-up time	power up, CTRL ON/OFF			10ms	20ms
ON/OFF CTRL [4]	DC-DC ON				open or high impedance
	DC-DC OFF		2mA	3mA	4mA
Standby Current	DC-DC OFF			2.5mA	
Internal Operating Frequency			100kHz		
Output Ripple and Noise	20MHz BW			50mVp-p	
Reflected Back Ripple Current	with external components	nom. V_{IN}= 24VDC		20mAp-p	
		nom. V_{IN}= 48VDC		15mAp-p	

Notes:

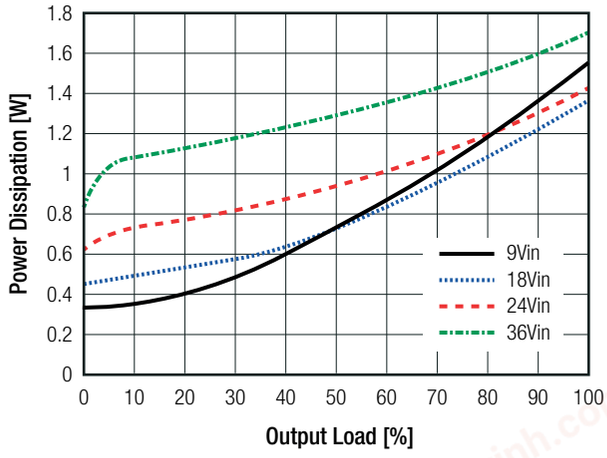
Note4: Refer to **"ON/OFF CTRL"**

R5M-2405S

Efficiency vs. Load

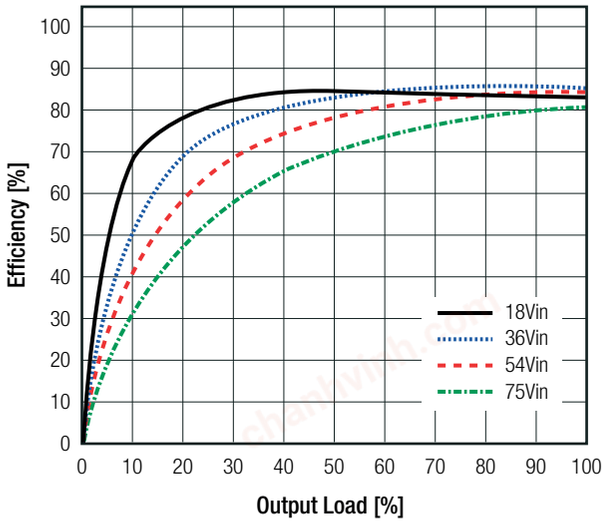


Power Dissipation vs. Load

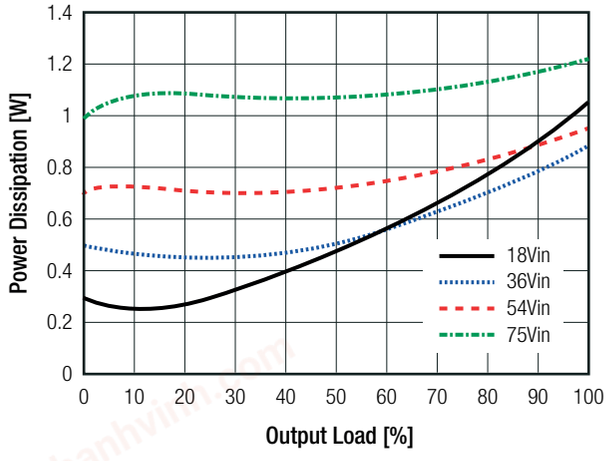


R5M-4812S

Efficiency vs. Load



Power Dissipation vs. Load



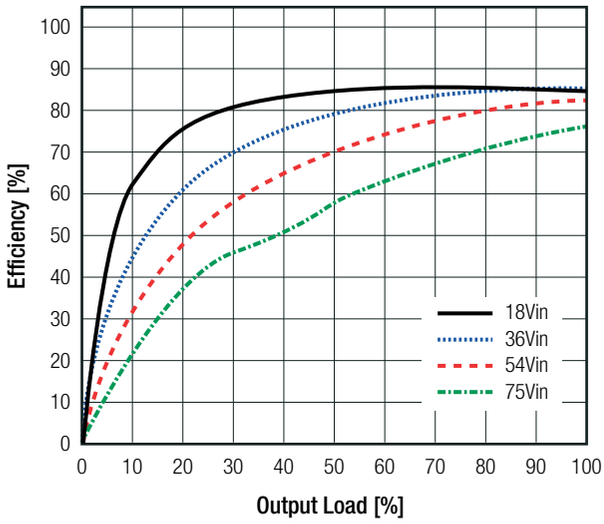
continued on next page

chanhvinh.com

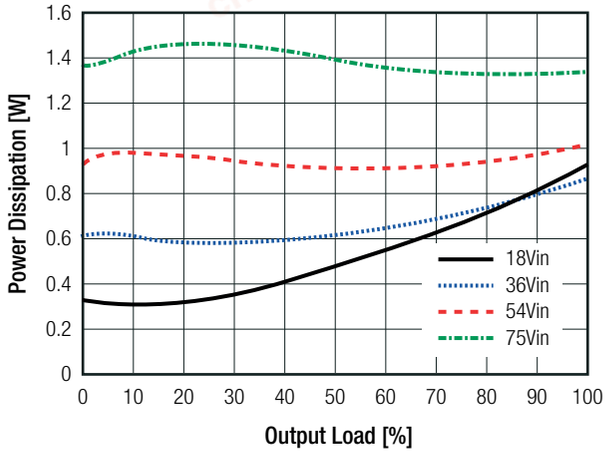
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

R5M-4824S

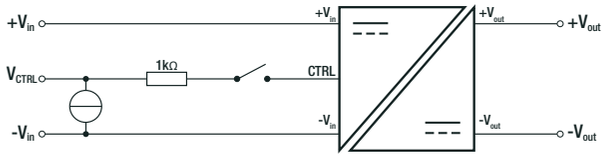
Efficiency vs. Load



Power Dissipation vs. Load



ON/OFF CTRL



DC-DC ON	Open or high impedance
DC-DC OFF	2.0mA to 4.0mA max.

REGULATIONS

Parameter	Condition		Value
Output Accuracy			±1.0% max.
Line Regulation	low line to high line, full load		±0.2% max.
Load Regulation	0% to 100% load	single	1% max.
		dual	1% max.
	10% to 90% load	single	0.5% max.
		dual	0.8% max.
Cross Regulation	asymmetrical 25% / 100% load		±5% max.
Transient Response Recovery Time	25% load step change		±500µs typ.

PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)			continuous, auto recovery
Isolation Voltage (5)	I/P to O/P	1 minute	1.6kVDC min.
Isolation Resistance	I/P to O/P, V_{ISO}= 500VDC		1GΩ min.
Isolation Capacitance	I/P to O/P, 100kHz/0.1V		50pF typ.

Notes:

Note5: This power module is not internally fused. An input line fuse must always be used
Recom suggests: 24Vin=T1.25A; 48Vin=T0.63A slow blow

chanhvinh.com

RECOM

DC/DC Converter

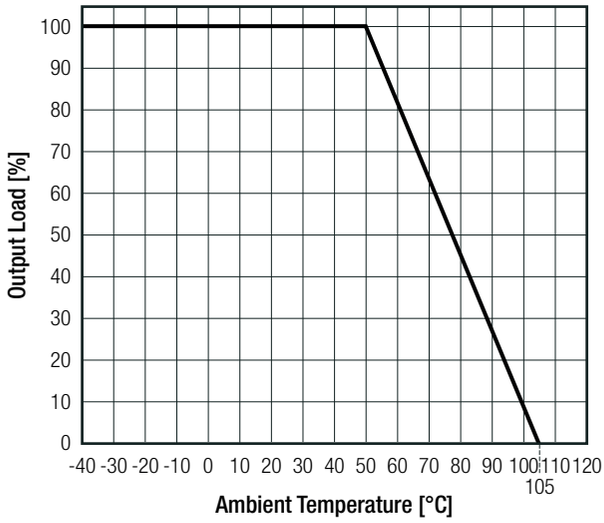
R5M Series

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

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	with derating		-40°C to +105°C
	without derating		-40°C to +50°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	2959 x 10^3 hours

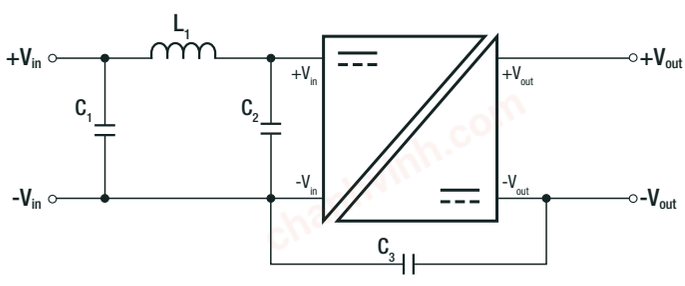
Derating Graph
(@ Chamber and natural convection 0.1m/s)



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
R5M-24xxS	10µF	N/A	330pF	22µH
R5M-48xxS	2.2µF	2.2µF	330pF	68µH

Class B Component List

Model	C1	C2	C3	L1
R5M-24xxS	10µF	N/A	680pF	22µH
R5M-48xxS	4.7µF	2.2µF	680pF	68µH

chanhvinh.com

RECOM

DC/DC Converter

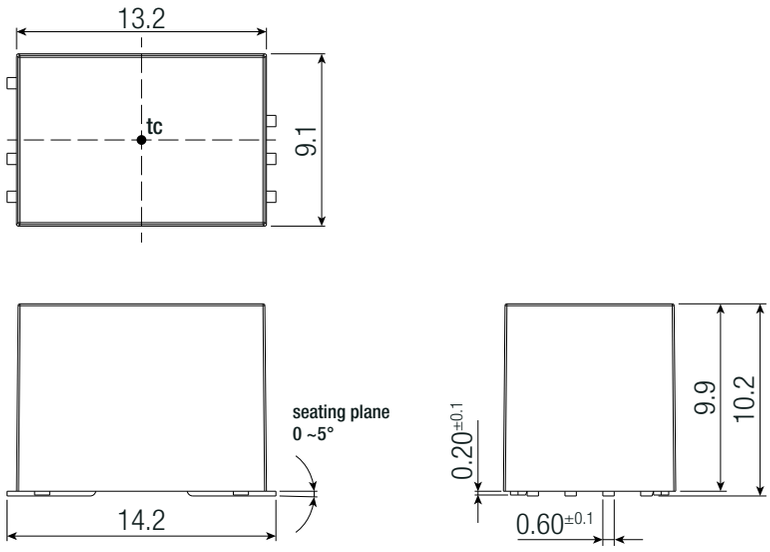
R5M Series

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

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	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.

Dimension Drawing standard "/SMD" version (mm)



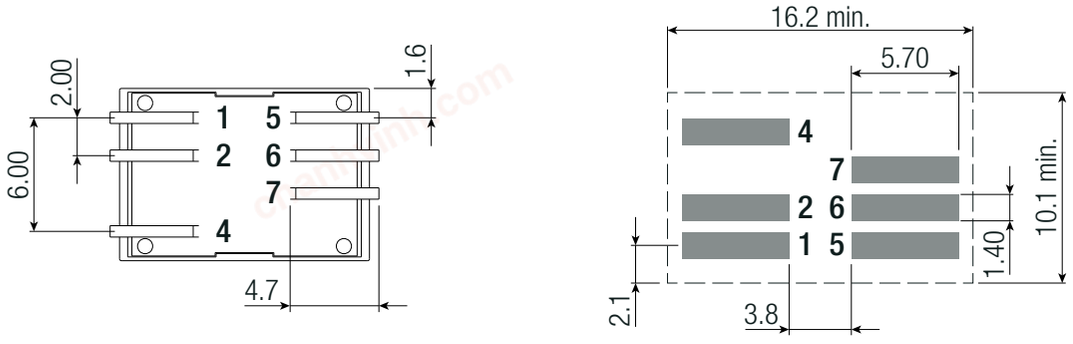


Pinning Information

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	CTRL	CTRL
5	NC	-Vout
6	-Vout	COM
7	+Vout	+Vout

NC= no connection

Recommended Footprint Details



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

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	218.0 x 17.2 x 19.9mm
Packaging Quantity		20pcs
Storage Temperature Range	non-condensing	-55°C to +125°C
Storage Humidity		5% to 95% RH max.
Moisture Sensitive Level	MSL peak temp. (6)	Level 2

Notes:

Note6: The Moisture Sensitivity Level rating is according to the JEDEC industry standard classifications and peak solder temperature

e 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 produc
ıre 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.