

## Features

## Unregulated Converters

- UL/CSA and EN-60950-1 Safety certified
- EN-61010 for Test, Measurement and Lab Use
- UL/CSA and EN-60601 for Medical Applications
- 6.4kVDC or 8kV Reinforced Isolation
- Optional Continuous Short Circuit Protection
- Efficiency to 88%
- Space Saving „Skinny DIP“ Package
- Very Low Isolation Capacitance

### Description

Very high isolation in a small size are the main features of this miniature DIP24 converter, ideal for highly sophisticated industrial, test and measurement and medical designs where board space is at a premium.

### Selection Guide

Part Number SIP 7	Reinforced Isolation (kVDC)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency Std (%)	Max Capacitive Load <sup>(1)</sup>
RV-xx3.3S	/R6.4 & /R8	3.3, 5, 12, 15, 24	3.3	600	70-78	3300µF
RV-xx05S	/R6.4 & /R8	3.3, 5, 12, 15, 24	5	400	76-80	1200µF
RV-xx09S	/R6.4 & /R8	3.3, 5, 12, 15, 24	9	222	78-85	1200µF
RV-xx12S	/R6.4 & /R8	3.3, 5, 12, 15, 24	12	167	78-85	680µF
RV-xx15S	/R6.4 & /R8	3.3, 5, 12, 15, 24	15	132	78-88	680µF
RV-xx3.3D	/R6.4 & /R8	3.3, 5, 12, 15, 24	±3.3	±300	70-78	±1500µF
RV-xx05D	/R6.4 & /R8	3.3, 5, 12, 15, 24	±5	±200	75-82	±470µF
RV-xx09D	/R6.4 & /R8	3.3, 5, 12, 15, 24	±9	±111	76-84	±470µF
RV-xx12D	/R6.4 & /R8	3.3, 5, 12, 15, 24	±12	±85	78-86	±220µF
RV-xx15D	/R6.4 & /R8	3.3, 5, 12, 15, 24	±15	±66	78-86	±220µF

xx = Input Voltage. Other input and output voltage combinations available on request.

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RV-0505S/P, RV-0505D/P

\* add Suffix "/R6.4" or "/R8" for Reinforced Isolation, e.g. RV-0505S/R6.4, RV-0505D/P/R8

For functional isolation, please refer to RV series datasheet

### Specifications (measured at $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

Input Voltage Range			±10%
Output Voltage Accuracy			±5%
Line Voltage Regulation			1.2%/1% of $V_{in}$ typ.
Load Voltage Regulation (10% to 100% full load)	3.3V output types		20% max.
	5V output type		15% max.
	9V, 12V, 15V, 24V output types		10% max.
Output Ripple and Noise (20MHz limited)			200mVp-p max.
Operating Frequency			20kHz min. / 50kHz typ. / 85kHz max.
Efficiency at Full Load			70% min. / 75% typ.
Minimum Load = 0%	Specifications valid for 10% minimum load only.		
Isolation Voltage	/R6.4	(tested for 1 second)	6400VDC
		(rated for 1 minute**)	3200VAC / 60Hz
	/R8	(tested for 1 second)	8000VDC
		(rated for 1 minute**)	4000VAC / 60Hz
Isolation Capacitance			2pF min. / 12pF max.
Isolation Resistance			15 GΩ min.
Short Circuit Protection			1 Second
P-Suffix			Continuous
Operating Temperature Range (free air convection)			-40°C to +85°C (see Graph)
Storage Temperature Range			-55°C to +125°C

continued on next page

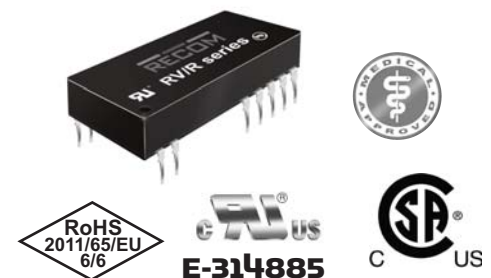
## ECONOLINE

### DC/DC-Converter

with 3 year Warranty

# RECOM

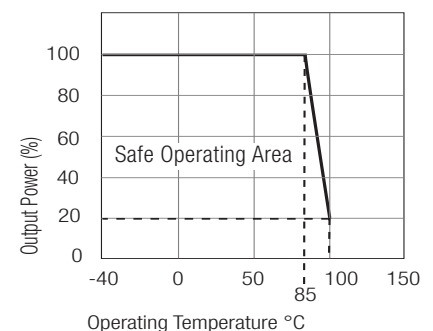
## 2 Watt DIP24 Miniature Single & Dual Output



**EN-60950-1 Certified**  
**EN-60601-1 Certified**  
**UL/CSA 60950-1 Certified**  
**UL-60601-1 Certified**  
**EN-61010-1 Certified**  
**IEC-60601-1 CB Report**

# RV/R

## Derating-Graph (Ambient Temperature)



\*\*Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.

Refer to Application Notes

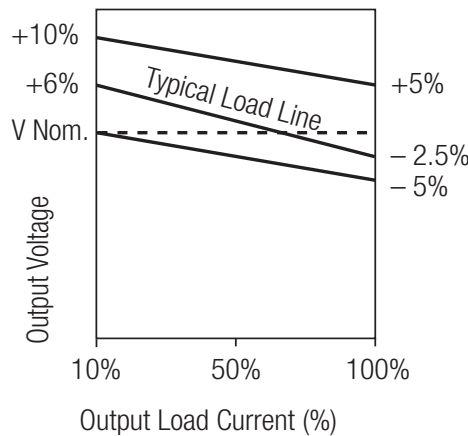
**Specifications** (measured at  $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

Relative Humidity			95% RH
Package Weight			9g
Packing Quantity			15 pcs per Tube
MTBF (+25°C) (+85°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	1154 x 10 <sup>3</sup> hours
		using MIL-HDBK 217F	168 x 10 <sup>3</sup> hours
Reinforced Isolation	Transformer Creepage	Reinforced Types	5.5 mm min.
	Transformer Clearance	Reinforced Types	5.5 mm min.
	PCB Creepage & Clearance	Reinforced Types	9.6 mm min.
Certifications			
Measurement, Control and Laboratory Use Safety	Report: T1301251-313	EN 61010-1 : 2010	
	CSA General Safety	UL 60950-1 1st Edition C22.2 No. 60950-1-03	
UL/cUL Medical Safety	Report: E314885-A4	UL60601-1 3rd Edition	
	CSA Medical Safety	Report: 2207629	CAN/CSA-22.2 No 601.1-M90
EN General Safety	Report: SPCLVD1310079-1	EN60950-1 : 2006	
EN Medical Safety	Report: CA-10168-A1-UL	IEC/EN 60601-1 3rd Edition	

Notes

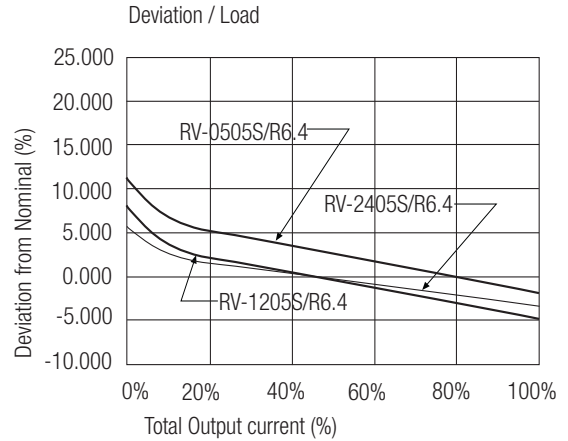
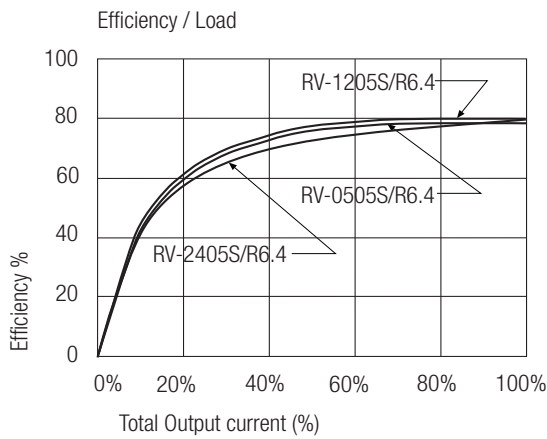
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

**Tolerance Envelope**

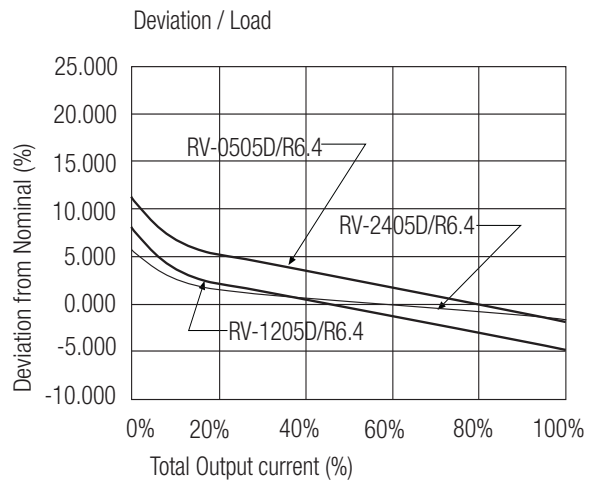
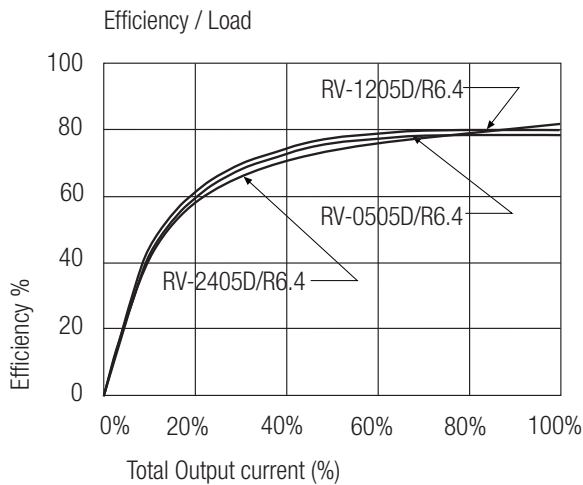


Typical Characteristics

**RV-xx05S/R6.4 and RV-xx05S/R8**

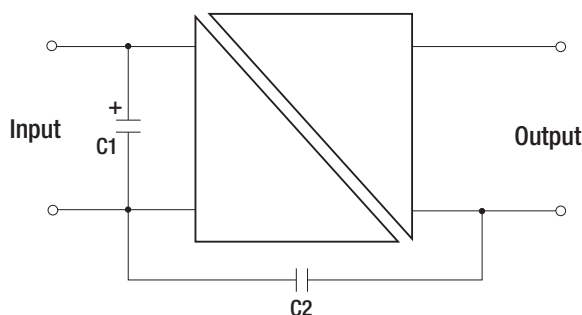


**RV-xx05D/R6.4 and RV-xx05D/R8**



EMC Filter Suggestions for EN55022 Class A and B

EN55022 Class A

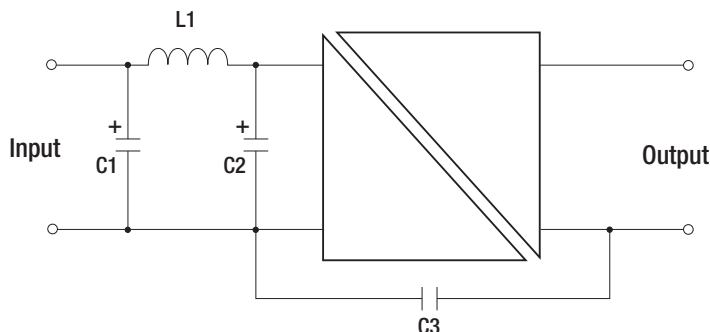


	C1	C2
RxxP2xx/R6.4	10µF	2n2F 8kV Vishay HGZ222MBP
RxxP2xx/R8	10µF	2n5F 10kV Vishay HGZ222MBP

RV/R

## EMC Filter Suggestions for EN55022 Class A and B

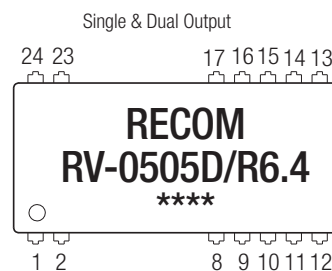
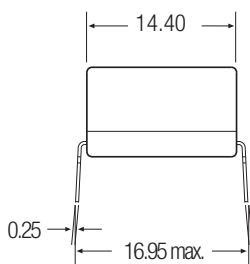
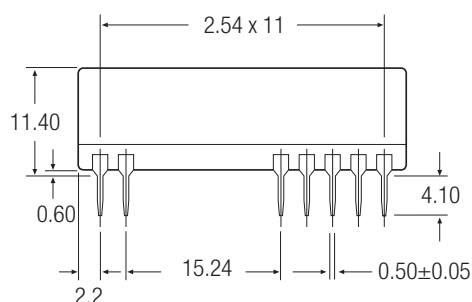
### EN55022 Class B



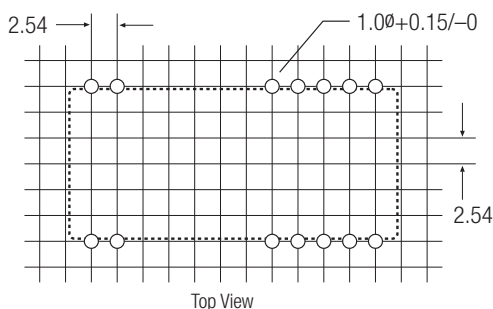
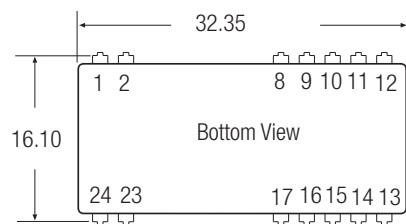
	C1	L1	C2	C3
RxxP2xx/R6.4	10µF	470µH WE 7447471471	10µF	2n2F 8kV Vishay HGZ222MBP
RxxP2xx/R8	10µF	470µH WE 7447471471	10µF	2n5F 10kV Vishay HGZ222MBP

## Package Style and Pinning (mm)

### 24 PIN DIP Miniature Package Style



### Recommended Footprint Details



#### Pin Connections

Pin #	Single
1	+Vin
2	-Vin
8, 9, 11, 14	NC
10, 15	-Vout
12 & 13	+Vout
16, 17, 23, 24	NC

#### Pin Connections

Pin #	Dual
1	+Vin
2	-Vin
8, 17	-Vout
9, 11, 14, 16, 23, 24	NC
10 & 15	Com
12, 13	+Vout

NC = No Connection

NC = No Connection

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

# Mouser Electronics

Authorized Distributor

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## RECOM:

[RV-0505D/P/R6.4](#) [RV-0505D/P/R8](#) [RV-0505D/R6.4](#) [RV-0505D/R8](#) [RV-0505S/P/R6.4](#) [RV-0505S/P/R8](#) [RV-0505S/R6.4](#) [RV-0505S/R8](#) [RV-0509D/P/R6.4](#) [RV-0509D/P/R8](#) [RV-0509D/R6.4](#) [RV-0509D/R8](#) [RV-0509S/P/R6.4](#) [RV-0509S/P/R8](#) [RV-0509S/R6.4](#) [RV-0509S/R8](#) [RV-0512D/P/R6.4](#) [RV-0512D/P/R8](#) [RV-0512D/R6.4](#) [RV-0512D/R8](#) [RV-0512S/P/R6.4](#) [RV-0512S/P/R8](#) [RV-0512S/R6.4](#) [RV-0512S/R8](#) [RV-0515D/P/R6.4](#) [RV-0515D/P/R8](#) [RV-0515D/R6.4](#) [RV-0515D/R8](#) [RV-0515S/P/R6.4](#) [RV-0515S/P/R8](#) [RV-0515S/R6.4](#) [RV-0515S/R8](#) [RV-053.3D/P/R6.4](#) [RV-053.3D/P/R8](#) [RV-053.3D/R6.4](#) [RV-053.3D/R8](#) [RV-053.3S/P/R6.4](#) [RV-053.3S/P/R8](#) [RV-053.3S/R6.4](#) [RV-053.3S/R8](#) [RV-1205D/P/R6.4](#) [RV-1205D/P/R8](#) [RV-1205D/R6.4](#) [RV-1205D/R8](#) [RV-1205S/P/R6.4](#) [RV-1205S/P/R8](#) [RV-1205S/R6.4](#) [RV-1205S/R8](#) [RV-1209D/P/R6.4](#) [RV-1209D/P/R8](#) [RV-1209D/R6.4](#) [RV-1209D/R8](#) [RV-1209S/P/R6.4](#) [RV-1209S/P/R8](#) [RV-1209S/R6.4](#) [RV-1209S/R8](#) [RV-1212D/P/R6.4](#) [RV-1212D/P/R8](#) [RV-1212D/R6.4](#) [RV-1212D/R8](#) [RV-1212S/P/R6.4](#) [RV-1212S/P/R8](#) [RV-1212S/R6.4](#) [RV-1212S/R8](#) [RV-1215D/P/R6.4](#) [RV-1215D/P/R8](#) [RV-1215D/R6.4](#) [RV-1215D/R8](#) [RV-1215S/P/R6.4](#) [RV-1215S/P/R8](#) [RV-1215S/R6.4](#) [RV-1215S/R8](#) [RV-123.3D/P/R6.4](#) [RV-123.3D/P/R8](#) [RV-123.3D/R6.4](#) [RV-123.3D/R8](#) [RV-123.3S/P/R6.4](#) [RV-123.3S/P/R8](#) [RV-123.3S/R6.4](#) [RV-123.3S/R8](#) [RV-1505D/P/R6.4](#) [RV-1505D/P/R8](#) [RV-1505D/R6.4](#) [RV-1505D/R8](#) [RV-1505S/P/R6.4](#) [RV-1505S/P/R8](#) [RV-1505S/R6.4](#) [RV-1505S/R8](#) [RV-1509D/P/R6.4](#) [RV-1509D/P/R8](#) [RV-1509D/R6.4](#) [RV-1509D/R8](#) [RV-1509S/P/R6.4](#) [RV-1509S/P/R8](#) [RV-1509S/R6.4](#) [RV-1509S/R8](#) [RV-1512D/P/R6.4](#) [RV-1512D/P/R8](#) [RV-1512D/R6.4](#) [RV-1512D/R8](#)