

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 ⁽¹⁾
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	$\pm 10\%$	
Output Voltage Accuracy	$\pm 5\%$	
Line Voltage Regulation	1.2%/1% of Vin typ.	
Load Voltage Regulation	3.3V output types	20% max.
(10% to 100% full load)	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) (rated for 1 minute**) 6400VDC 3200VAC / 60Hz
	/R8	(tested for 1 second) (rated for 1 minute**) 8000VDC 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

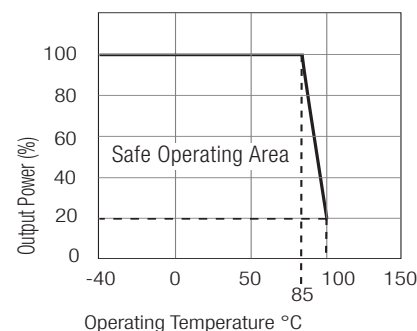
2 Watt DIP24 Miniature Single & Dual Output



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

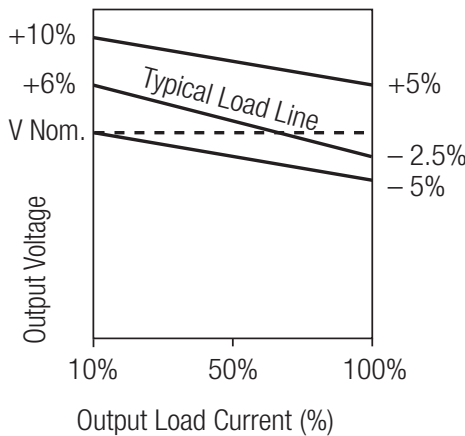
Specifications (measured at $T_A = 25^{\circ}\text{C}$, nominal input voltage, full load and after warm-up)

Relative Humidity	95% RH		
Package Weight	9g		
Packing Quantity	15 pcs per Tube		
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	1154 x 10 ³ hours
(+85°C)		using MIL-HDBK 217F	168 x 10 ³ 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

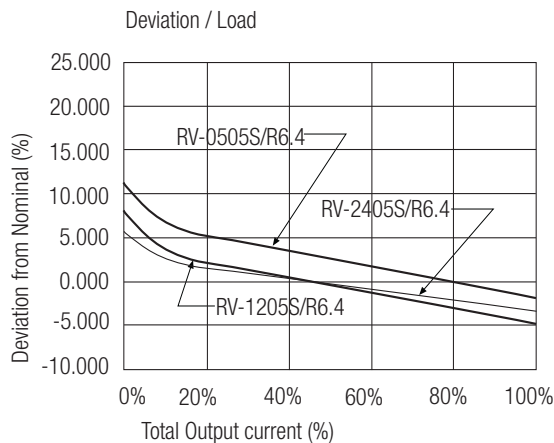
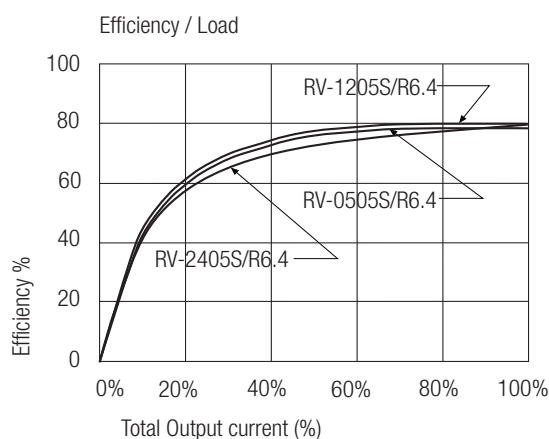
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

Tolerance Envelope

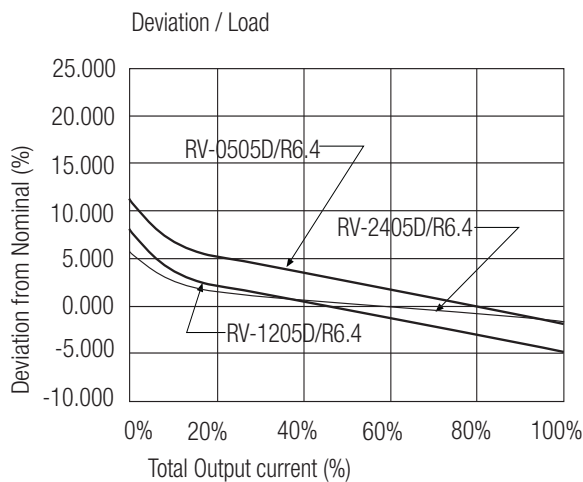
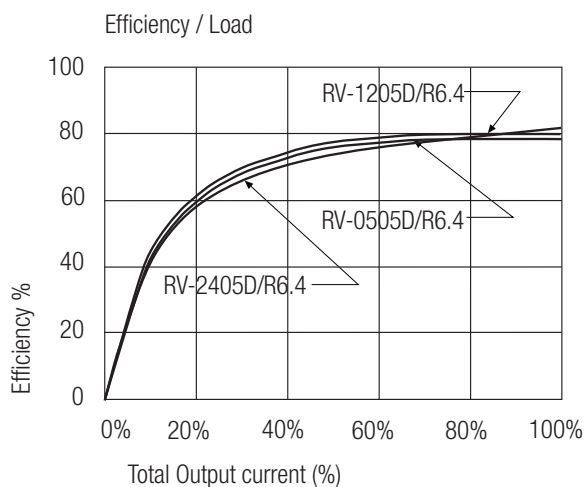


Typical Characteristics

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

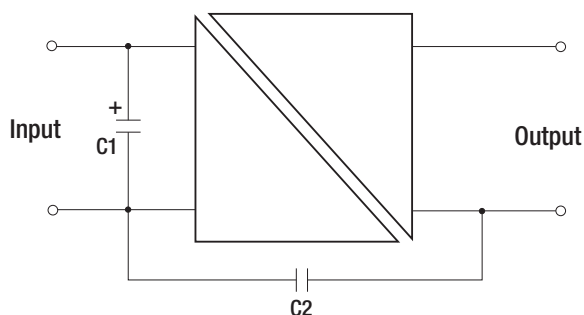


RV-xx05D/R6.4 and RV-xx05D/R8



EMC Filter Suggestions for EN55022 Class A and B

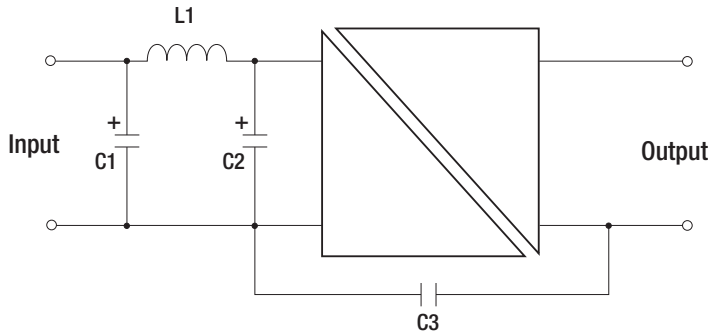
EN55022 Class A



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

EMC Filter Suggestions for EN55022 Class A and B

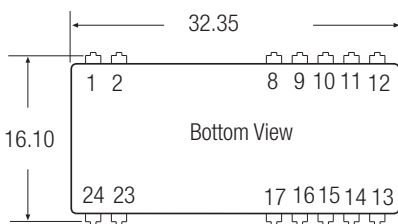
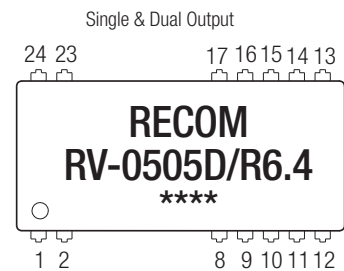
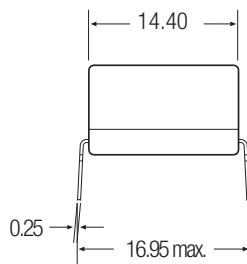
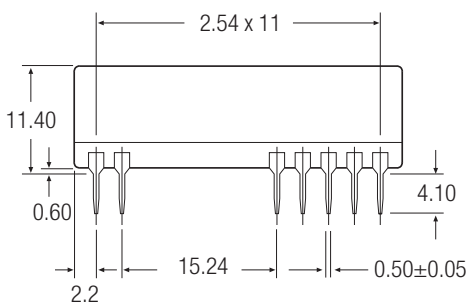
EN55022 Class B



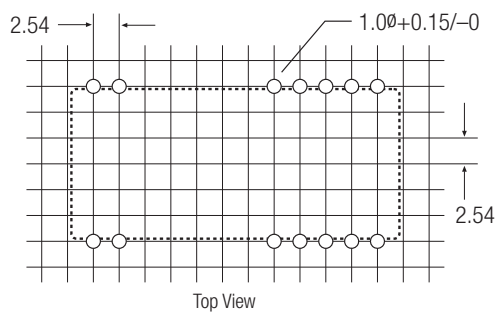
	C1	L1	C2	C3
RxxP2xx/R6.4	10 μ F	470 μ H WE 7447471471	10 μ F	2n2F 8kV Vishay HGZ222MBP
RxxP2xx/R8	10 μ F	470 μ H WE 7447471471	10 μ F	2n5F 10kV Vishay HGZ222MBP

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

XX.X $\pm$ 0.5 mm
XX.XX $\pm$ 0.25 mm

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