

Features

Unregulated Converters

- IEC60601-1 for medical applications
- UL/CSA/IEC/EN safety certified and CB report
- 6.4kVDC/1s or 8kVDC/1s reinforced isolation
- Optional continuous short circuit protection
- Efficiency up to 88%
- Space saving package
- Very low isolation capacitance



RV/R

**2 Watt
DIP24
miniature
Single and Dual
Output**



Description

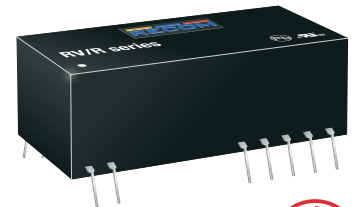
Very high isolation in a small size are the main features of this miniature DIP24 converter, ideal for highly sophisticated industrial, test and measurement and medical designs where board space is at a premium.

Selection Guide

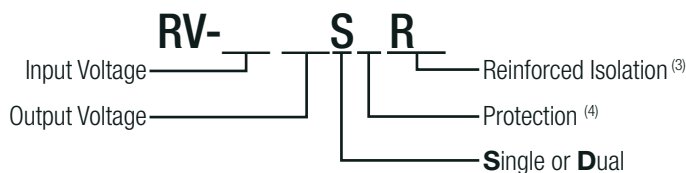
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load(2) [µF]
RV-xx3.3S (3,4)	3.3, 5, 12, 15, 24	3.3	600	70-78	3300
RV-xx05S (3,4)	3.3, 5, 12, 15, 24	5	400	76-80	1200
RV-xx09S (3,4)	3.3, 5, 12, 15, 24	9	222	78-85	1200
RV-xx12S (3,4)	3.3, 5, 12, 15, 24	12	167	78-85	680
RV-xx15S (3,4)	3.3, 5, 12, 15, 24	15	132	78-88	680
RV-xx3.3D (3,4)	3.3, 5, 12, 15, 24	±3.3	±300	70-78	±1500
RV-xx05D (3,4)	3.3, 5, 12, 15, 24	±5	±200	75-82	±470
RV-xx09D (3,4)	3.3, 5, 12, 15, 24	±9	±111	76-84	±470
RV-xx12D (3,4)	3.3, 5, 12, 15, 24	±12	±85	78-86	±220
RV-xx15D (3,4)	3.3, 5, 12, 15, 24	±15	±66	78-86	±220

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



Model Numbering



Notes:

- Note3: add suffix „/R6.4“ for 6.4kVDC/1second isolation or „/R8“ for 8kVDC/1second isolation
 Note4: standard part is without continuous short circuit protection add suffix „/P“ for continuous short circuit protection

Ordering Examples

- RV-1212D/R6.4 = 12V Input, 12V Output, Dual, 6.4kVDC/1s isolation
 RV-053.3S/P/R8 = 5V Input, 3.3V Output, Single, short circuit protection, 8kVDC/1s isolation

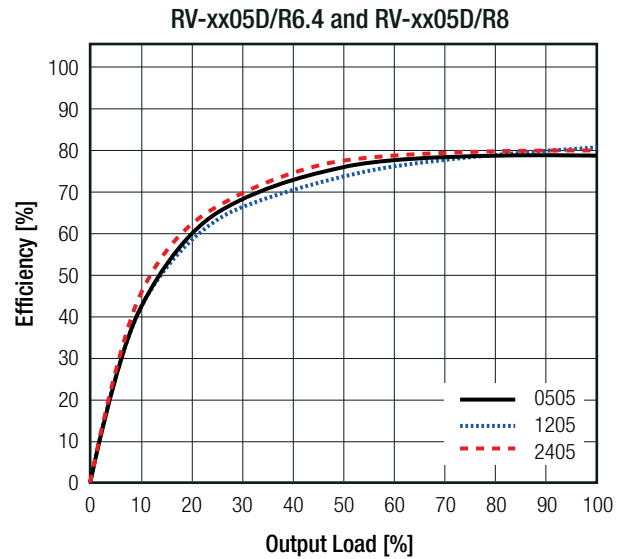
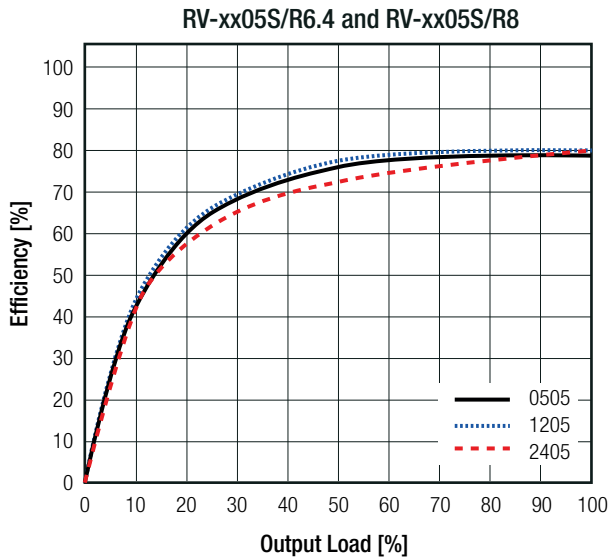
UL60950-1 certified
 CAN/CSA-C22.2 No. 60950-1 certified
 IEC/EN60950-1 certified
 ANSI/AAMI ES60601-1 certified
 CAN/CSA-C22.2 No. 60601-1 certified
 IEC/EN60601-1 certified
 IEC/EN61010 certified
 CB report

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		20kHz	50kHz	85kHz
Output Ripple and Noise	20MHz BW			200mVp-p

Efficiency vs. Load



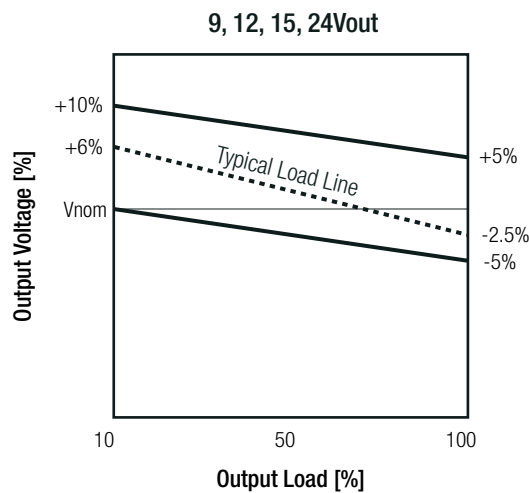
REGULATIONS

Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line		±1.2% of 1.0% Vin typ.
Load Regulation ⁽⁵⁾	10% to 100% load	3.3Vout	20.0% max.
		5Vout	15.0% max.
		9, 12, 15Vout	10.0% max.

Notes:

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

Tolerance Envelope

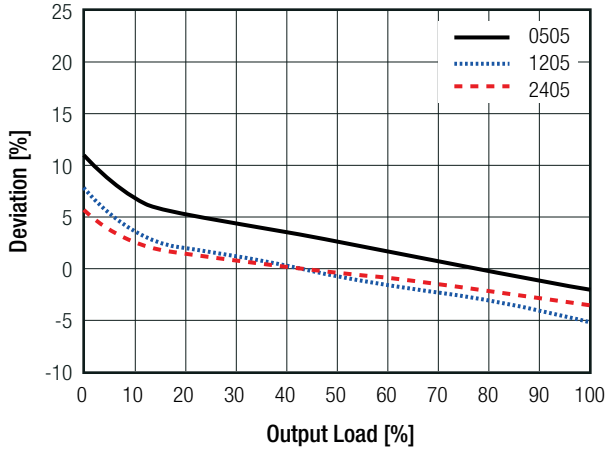


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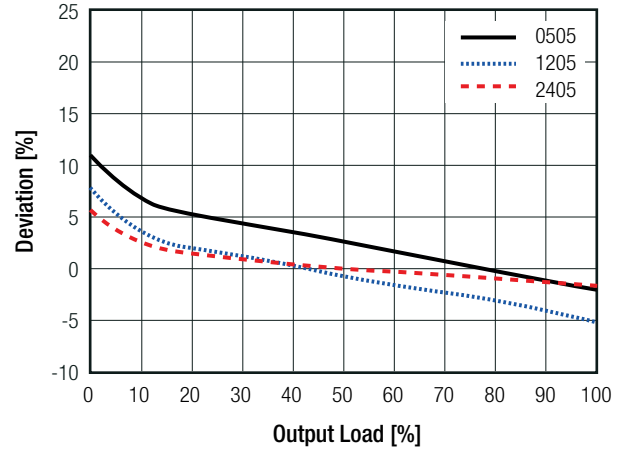
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Deviation vs. Load

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



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



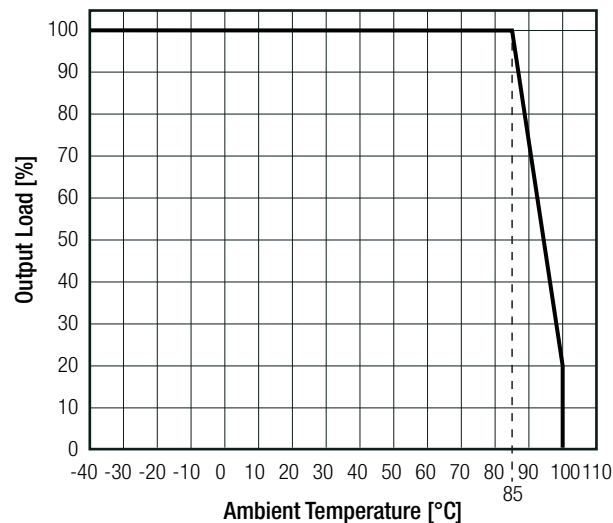
PROTECTIONS			
Parameter	Type		Value
Short Circuit Protection (SCP)	without suffix with suffix "/P"		1 second continuous
Isolation Voltage ⁽⁶⁾	I/P to O/P	"/R6.4"	6.4kVDC 3.2kVAC/60Hz
		"/R8"	8kVDC 4kVAC/60Hz
Isolation Resistance			15GΩ min.
Isolation Capacitance			2pF min. / 12pF max.
Insulation Grade			reinforced
Means of Protection	34Vr.m.s.		2MOPP
Internal	clearance/creepage		>4.8mm
External	clearance/creepage		>4.8mm
Notes:			
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage			
Note7: Refer to local safety regulations if input over-current protection is required. Recommended fuse: slow blow type			

Specifications (measured @ Ta= 25°C, nom. Vin, 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°C
Operating Altitude			3000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	1154 x 10 ³ hours
		+85°C	168 x 10 ³ hours

Derating Graph (@ free air convection)



SAFETY AND CERTIFICATIONS

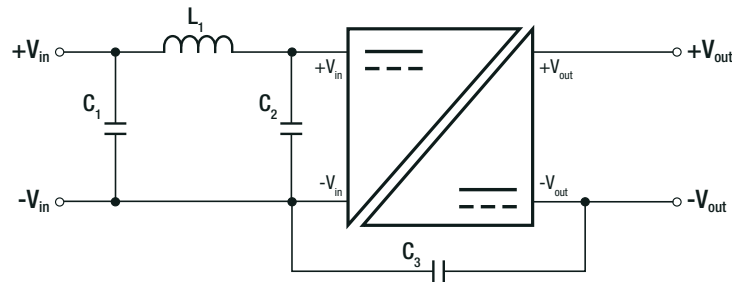
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	2236395	ANSI/UL60950-1, 1st Edition CAN/CSA C22.2 No. 60950-1-03
Information Technology Equipment, General Requirements for Safety	LVD1605077-14	IEC60950-1-2005, 2nd Edition + A2:2013 EN60950-1: 2006 + A2:2013
Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance	E314885-A5-UL	ANSI/AAMI ES60601-1:2005 + A2:10 CAN/CSA-C22.2 No. 60601-1:2008
Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance (CB Scheme)	E314885-A5-CB-1	IEC60601-1:2005 + C2:2007
Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance	WD-SE-R-180539-A0	IEC60601-1:2005 + A1:2012, 3rd Edition EN60601-1:2006 + A12:2014
Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	T1301251-313	EN61010:2010 IEC61010:2010
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 (refer to "EMC Filter Suggestion" below)	EN55032, Class A EN55032, Class B

continued on next page

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

EMC Filter Suggestion according to EN55032



Component List Class A

Model	C1	C2	C3	L1
RV/R6.4	N/A	10µF	2n2F 8kV	N/A
RV/R8			2n5F 10kV	

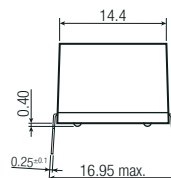
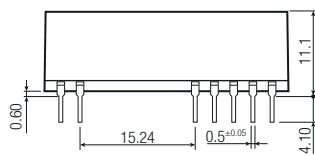
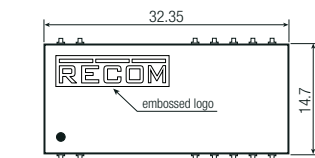
Component List Class B

Model	C1	C2	C3	L1
RV/R6.4	10µF	10µF	2n2F 8kV	470µH
RV/R8			2n5F 10kV	WE7447471471

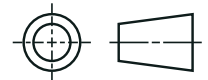
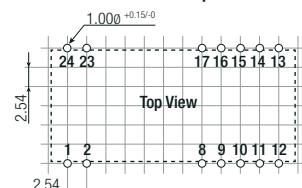
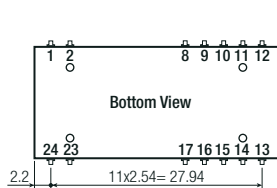
DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB	non-conductive black plastic, (UL94 V-0) silicone, (UL94 V-0) FR4, (UL94 V-0)
Dimension (LxWxH)		32.35 x 14.7 x 11.1mm
Weight		9.0g typ.

Dimension Drawing (mm)



Recommended Footprint Details



Pinning Information

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

NC= No Connection
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

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

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	530.0 x 21.0 x 18.0mm
Packaging Quantity	tube	15pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.

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