

Features

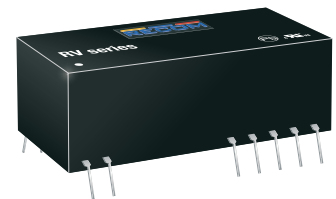
Unregulated Converters

- UL/CSA/IEC/EN safety certified and CB report
- 6kVDC/1s isolation
- Optional continuous short circuit protection
- Efficiency up to 82%
- Space saving package
- Very low isolation capacitance
- Suitable for IGBT application

RECOM
DC/DC Converter

RV

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



UL60950-1 certified
CAN/CSA-C22.2 No. 60950-1-07 certified
IEC/EN60950-1 certified
UL62368-1 certified
CAN/CSA-C22.2 No. 62368-1-14 certified
IEC/EN62368-1 certified
CB report

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

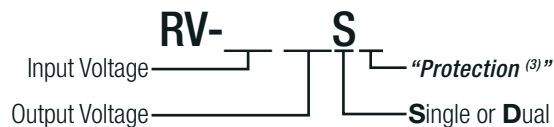
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [μF]
RV-xx3.3S ⁽³⁾	3.3, 5, 12, 15, 24	3.3	600	70	3300
RV-xx05S ⁽³⁾	3.3, 5, 12, 15, 24	5	400	70-75	1200
RV-xx09S ⁽³⁾	3.3, 5, 12, 15, 24	9	222	70-75	1200
RV-xx12S ⁽³⁾	3.3, 5, 12, 15, 24	12	167	70-75	680
RV-xx15S ⁽³⁾	3.3, 5, 12, 15, 24	15	132	75-80	680
RV-xx24S ⁽³⁾	3.3, 5, 12, 15, 24	24	83	75-80	220
RV-xx3.3D ⁽³⁾	3.3, 5, 12, 15, 24	±3.3	±300	70	±1500
RV-xx05D ⁽³⁾	3.3, 5, 12, 15, 24	±5	±200	70-75	±470
RV-xx09D ⁽³⁾	3.3, 5, 12, 15, 24	±9	±111	70-75	±470
RV-xx12D ⁽³⁾	3.3, 5, 12, 15, 24	±12	±85	70-75	±220
RV-xx15D ⁽³⁾	3.3, 5, 12, 15, 24	±15	±66	75-80	±220
RV-xx24D ⁽³⁾	3.3, 5, 12, 15, 24	±24	±42	75-80	±100
RV-xx1509D	5, 12, 24	+15/-9	+67/-111	70-82	±330

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: standard part is without continuous short circuit protection
add suffix „/P“ for continuous short circuit protection

Ordering Examples

RV-053.3S/P = 5V Input, 3.3V Output, Single, short circuit protection

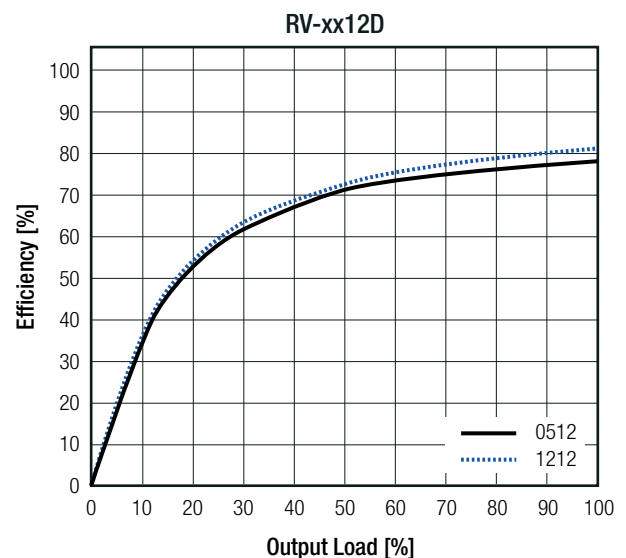
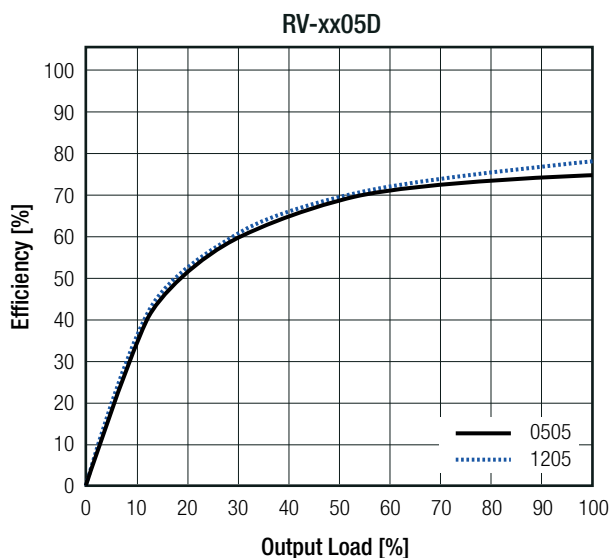
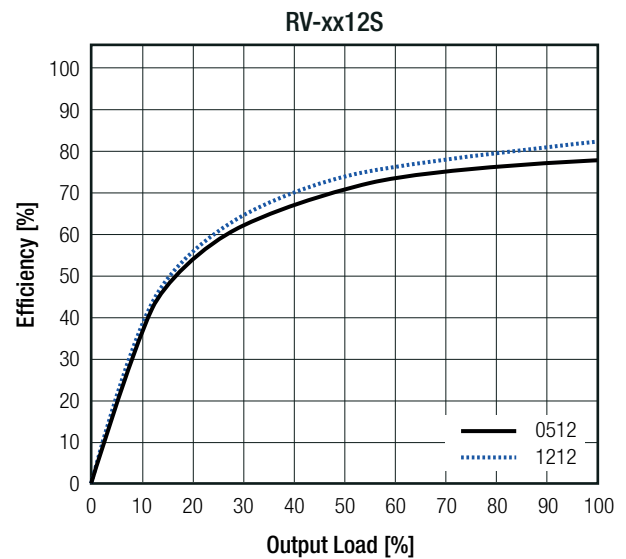
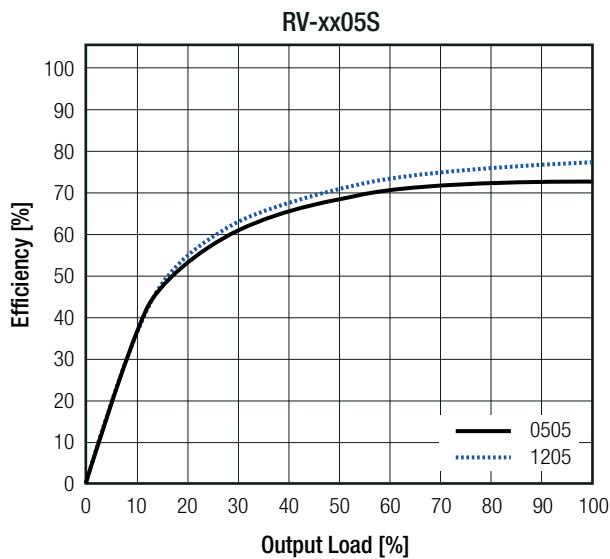
RV-1212D = 12V Input, 12V Output, Dual

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	all others RV-XX1509D	20kHz 20kHz	50kHz 47kHz	85kHz
Output Ripple and Noise	20MHz BW			200mVp-p

Efficiency vs. Load



REGULATIONS

Parameter	Condition		Value
Output Accuracy			±5.0% typ.
Line Regulation	low line to high line		±1.2% of 1.0% Vin typ.
Load Regulation ⁽⁴⁾	10% to 100% load	3.3Vout	20.0% max.
		5Vout	15.0% max.
		9, 12, 15, 24 and +15/-9Vout	10.0% max.

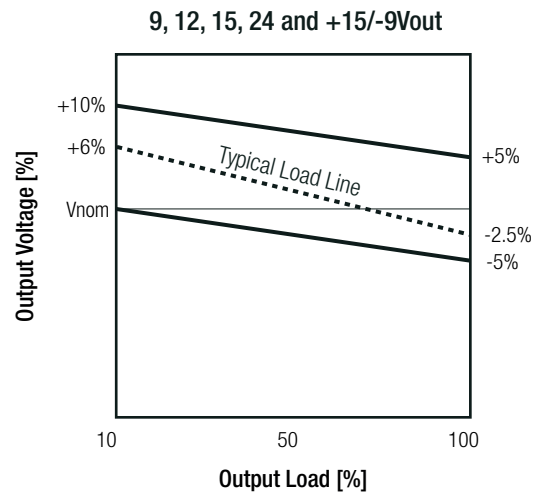
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Specifications (measured @ $T_a = 25^\circ\text{C}$, nom. V_{in} , full load and after warm-up unless otherwise stated)

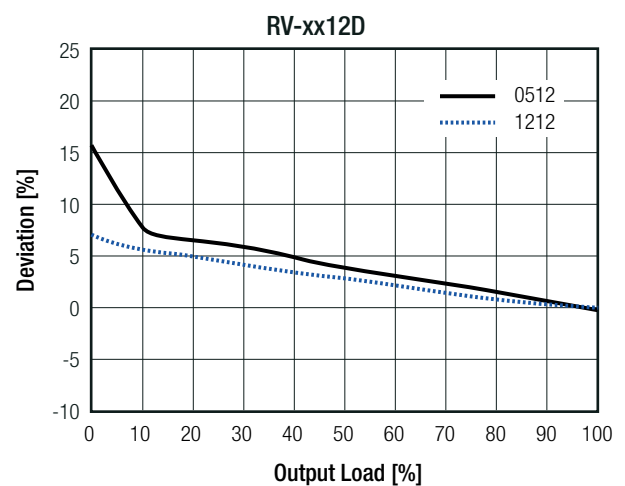
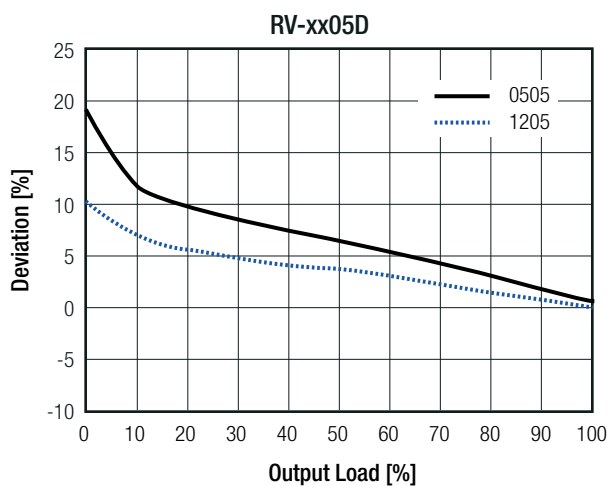
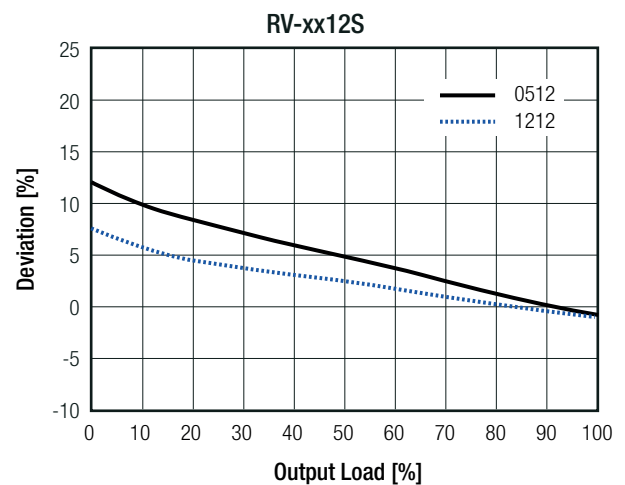
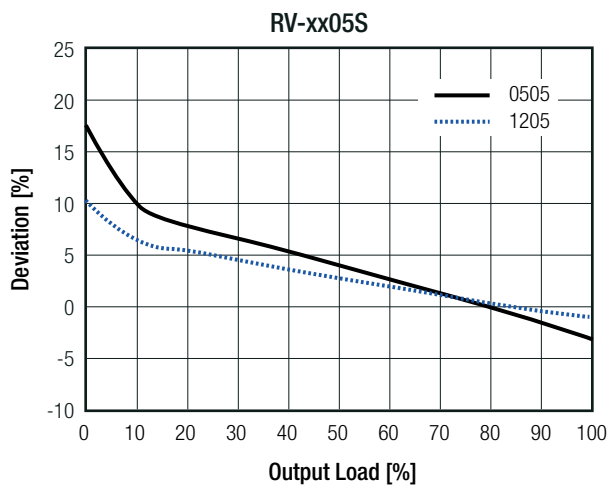
Notes:

Note4: Operation below 10% load will not harm the converter, but specifications may not be met

Tolerance Envelope



Deviation vs. Load



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

PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	without suffix with suffix "/P"		1 second continuous
Isolation Voltage ⁽⁵⁾	I/P to O/P	tested for 1 second rated for 1 minute	6kVDC 3kVAC/60Hz
Isolation Resistance			15GΩ min.
Isolation Capacitance			2pF min. / 12pF max.
Insulation Grade			basic (IEC/EN60950-1, IEC/EN62368-1) functional (IEC/EN60601-1)

Notes:

Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage

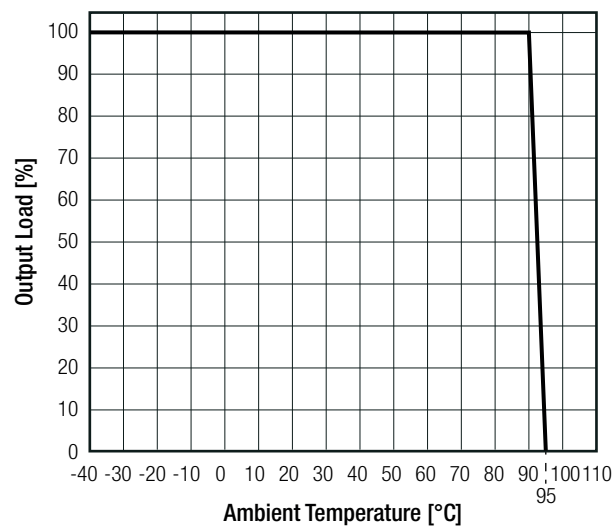
Note6: Refer to local safety regulations if input over-current protection is required. Recommended fuse: slow blow type

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection (see graph)		-40°C to +90°C
Operating Altitude			3000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +85°C	1154 x 10 ³ hours 168 x 10 ³ hours

Derating Graph

(@ free air convection)



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

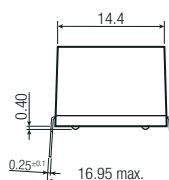
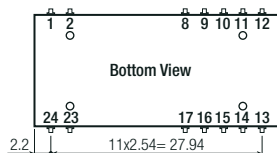
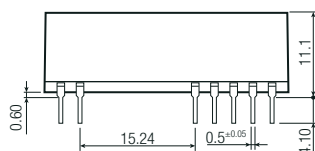
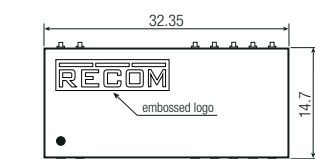
SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E224736-A56-UL	CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2014 UL No. 60950-1, 2nd Edition, 2014
Information Technology Equipment, General Requirements for Safety (LVD)	LVD1602031	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Audio/Video, information and communication technology equipment - Part1: Safety requirements	E224736-A56-UL	CAN/CSA-C22.2 No. 62368-1-14, 2nd Edition UL62368-1, 2nd Edition, 2014
Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance	WD-SE-R-180541-A0	IEC60601-1:2005 + A1:2012, 3rd Edition EN60601-1:2006 + A12:2014
Audio/Video, information and communication technology equipment - Part1: Safety requirements	ATTCB106076	EN62368-1:2014 + A11:2017
Audio/Video, information and communication technology equipment - Part1: Safety requirements (CB Scheme)		IEC62368-1:2014 2nd Edition
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS 2		RoHS-2011/65/EU + AM-2015/863

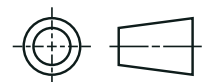
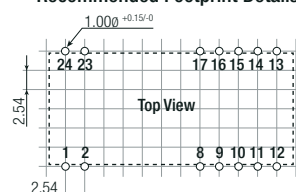
DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB	non-conductive black plastic, (UL94 V-0) epoxy, (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

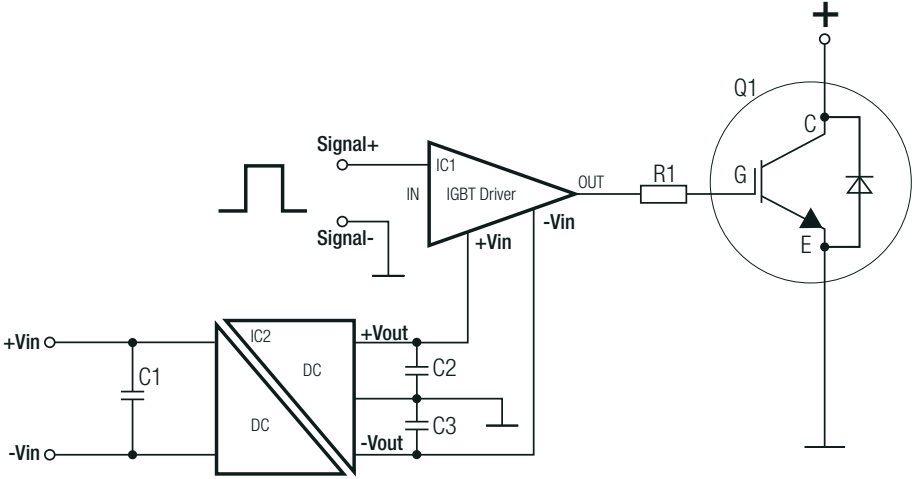
Tolerance: xx.x= ±0.5mm

xx.xx= ±0.25mm

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

INSTALLATION AND APPLICATION

IGBT Application Circuit



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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