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# Features

## Unregulated Converters

- Low Cost 1W Converter
- Power Sharing on Dual Output Version
- Industry Standard Pinout
- 1kVDC or 2kVDC Isolation Options
- Optional Continuous Short Circuit Protected
- UL94V-0 Package Material
- Efficiency to 85 %

### Description

The RB series DC/DC converter has been designed for isolating or converting DC power rails in general purpose applications. Although low cost, it does not compromise on features and offers 1kVDC or 2kVDC isolation, a  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  operating temperature range and optional continuous short circuit protection.

### Selection Guide

Part Number		Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)	Max Capacitive Load <sup>(1)</sup>
RB-xx3.3S	(H)	3.3, 5, 12, 15, 24	3.3	303	75	2200 $\mu\text{F}$
RB-xx05S	(H)	3.3, 5, 12, 15, 24	5	200	70-78	1000 $\mu\text{F}$
RB-xx09S	(H)	3.3, 5, 12, 15, 24	9	111	70-78	1000 $\mu\text{F}$
RB-xx12S	(H)	3.3, 5, 12, 15, 24	12	84	78-80	470 $\mu\text{F}$
RB-xx15S	(H)	3.3, 5, 12, 15, 24	15	66	80-84	470 $\mu\text{F}$
RB-xx24S	(H)	3.3, 5, 12, 15, 24	24	42	74-85	220 $\mu\text{F}$
RB-xx3.3D	(H)	3.3, 5, 12, 15, 24	$\pm 3.3$	$\pm 152$	70	$\pm 1000\mu\text{F}$
RB-xx05D	(H)	3.3, 5, 12, 15, 24	$\pm 5$	$\pm 100$	70-78	$\pm 470\mu\text{F}$
RB-xx09D	(H)	3.3, 5, 12, 15, 24	$\pm 9$	$\pm 56$	76-79	$\pm 470\mu\text{F}$
RB-xx12D	(H)	3.3, 5, 12, 15, 24	$\pm 12$	$\pm 42$	78-82	$\pm 220\mu\text{F}$
RB-xx15D	(H)	3.3, 5, 12, 15, 24	$\pm 15$	$\pm 33$	80-84	$\pm 220\mu\text{F}$
RB-xx24D	(H)	3.3, 5, 12, 15, 24	$\pm 24$	$\pm 21$	80-84	$\pm 100\mu\text{F}$

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

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

### 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 $V_{in}$ typ.
Load Voltage Regulation	3.3V output type	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)	Single output types	100mVp-p max.
	Dual output types	$\pm 75\text{mVp-p}$ max.
Operating Frequency		50kHz min. / 100kHz typ. / 105kHz max.
Efficiency at Full Load		70% min. / 80% typ.
Minimum Load = 0%		Specifications valid for 10% minimum load only.
Isolation Voltage	(tested for 1 second)	1000VDC
	(rated for 1 minute**)	500VAC / 60Hz
Isolation Voltage	H-Suffix (tested for 1 second)	2000VDC
	H-Suffix (rated for 1 minute**)	1000VAC / 60Hz
Isolation Capacitance		20pF min. / 75pF max.
Isolation Resistance		10 $\text{G}\Omega$ min.
Short Circuit Protection		1 Second
P-Suffix		Continuous
Operating Temperature Range (free air convection)		$-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ (see Graph)
Storage Temperature Range		$-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$
Relative Humidity		95% RH

continued to next page

# ECONOLINE

## DC/DC-Converter

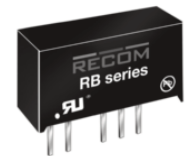
with 3 year Warranty

# RECOM

## 1 Watt

## SIP7

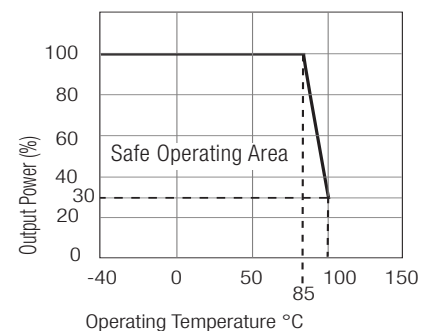
## Single & Dual Output



**EN-60950-1 Certified**  
**UL-60950-1 Certified**  
**EN-60601-1 Certified\***  
 (\* /H suffix)

# RB

## 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)

Package Weight			2.2g
Packing Quantity			25 pcs per Tube
MTBF (+25°C)	} <i>Detailed Information see</i> <i>Application Notes chapter "MTBF"</i>	using MIL-HDBK 217F	1012 x 10 <sup>3</sup> hours
(+85°C)		using MIL-HDBK 217F	151 x 10 <sup>3</sup> hours

**Certifications**

CB Test Report

UL General Safety

EN General Safety

EN Medical Safety

Report: E22406

Report: E358085

Report: SPCLVD1109103

Report: MDD1112018 + RM1112018

EditionMedical Report + ISO14971 Risk Assessment

IEC 60950-1:2005 2nd Ed.

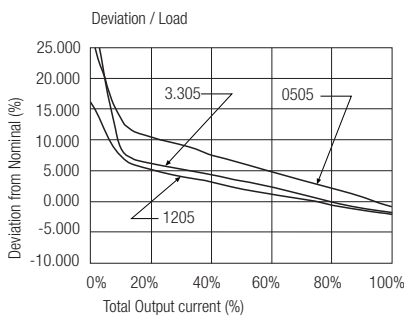
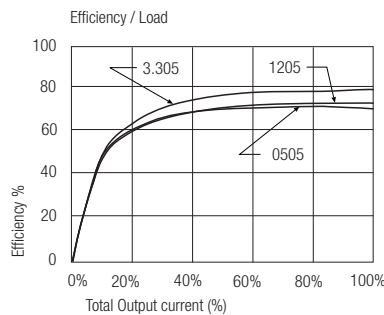
UL 60950-1 2nd Ed.

EN60950-1:2006 + A12:2011

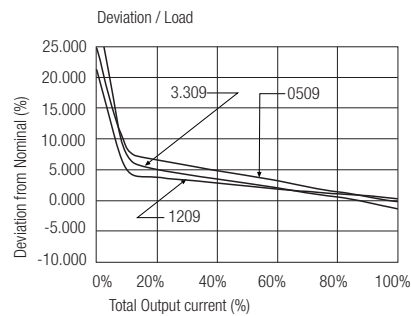
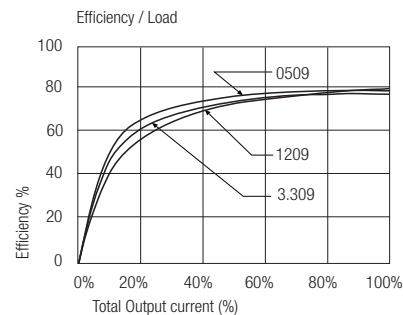
IEC/EN 60601-1 3rd

**Typical Characteristics - Single Output**

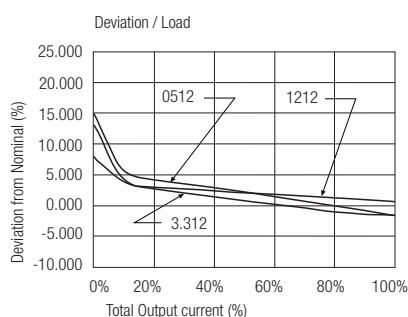
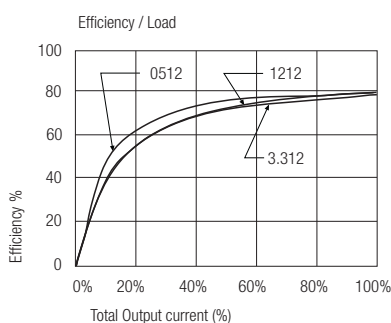
## RB-xx05S



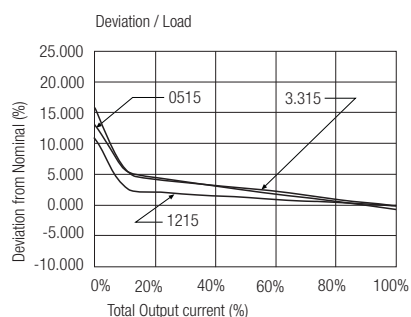
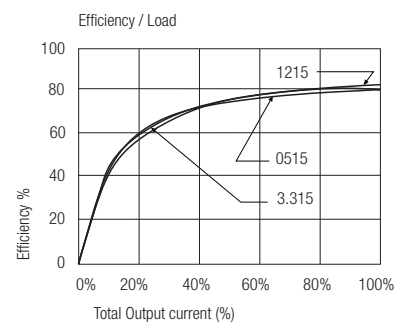
## RB-xx09S



## RB-xx12S



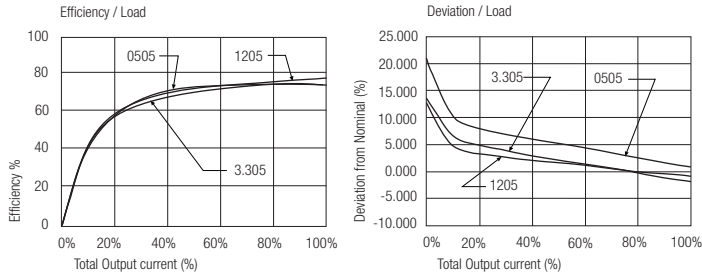
## RB-xx15S



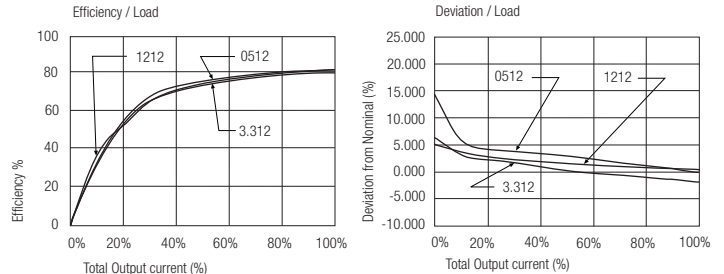
RB

**Typical Characteristics - Dual Outputs**

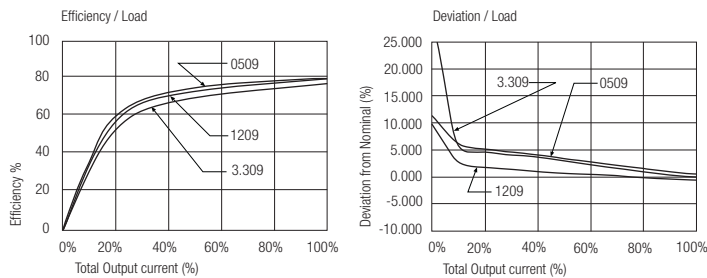
**RB-xx05D**



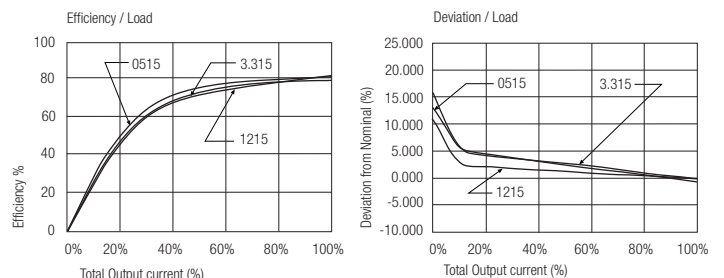
**RB-xx12D**



**RB-xx09D**



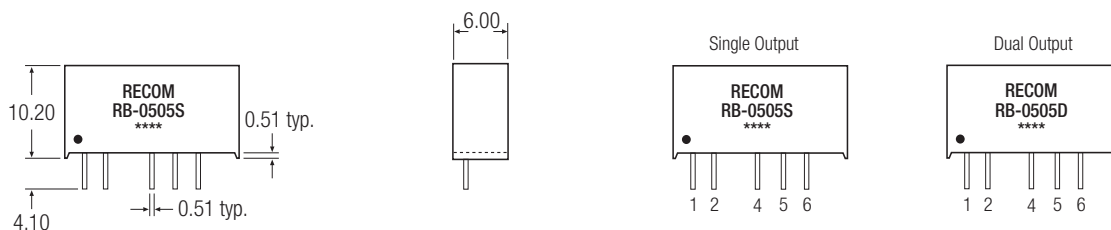
**RB-xx15D**



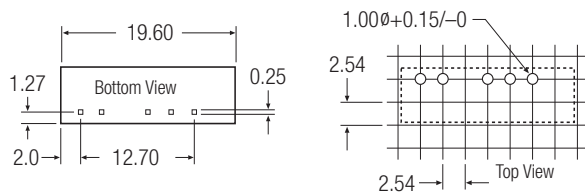
**Notes**  
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

**Package Style and Pinning (mm)**

**SIP7 Package**



**Recommended Footprint Details**



**Pin Connections**

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	NC	-Vout
5	-Vout	Com
6	+Vout	+Vout

NC = No Connection  
XX.X ± 0.5 mm  
XX.XX ± 0.25 mm