

## 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>
SIP 7	(2kV)					
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 (10% to 100% full load)	3.3V output type	20% max.
	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	2000VDC
	H-Suffix	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 $+125^{\circ}\text{C}$	

## ECONOLINE

## DC/DC-Converter

with 3 year Warranty

RECOM

## 1 Watt

## SIP7

## Single & Dual Output

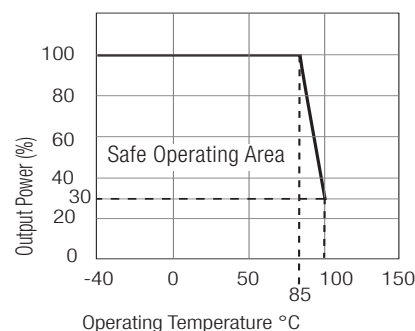


RECOM  
E-224736

EN-60950-1 Certified  
UL-60950-1 Certified

## RB

## Derating-Graph (Ambient Temperature)



Refer to Application Notes

www.recom-electronic.com

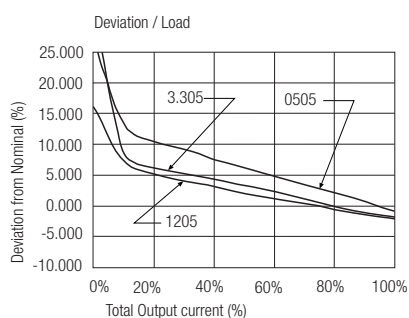
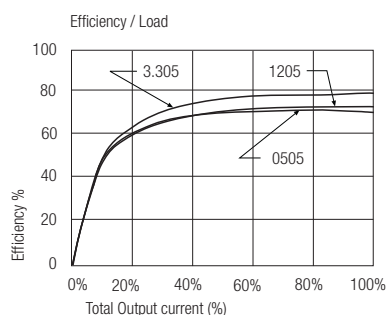


## Specifications - continued

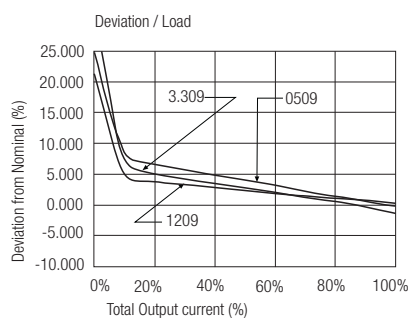
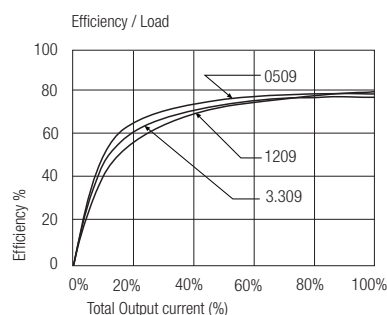
Relative Humidity	95% RH		
Package Weight	2.2g		
Packing Quantity	25 pcs per Tube		
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	1012 x 10 <sup>3</sup> hours
(+85°C)		using MIL-HDBK 217F	151 x 10 <sup>3</sup> hours

## Typical Characteristics - Single Output

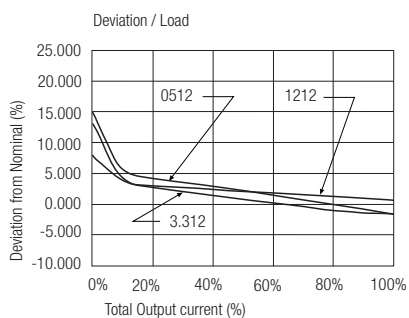
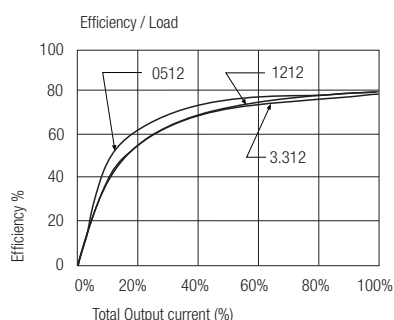
### RB-xx05S



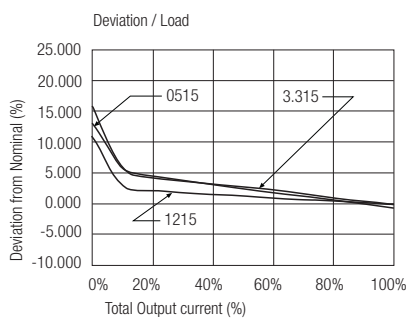
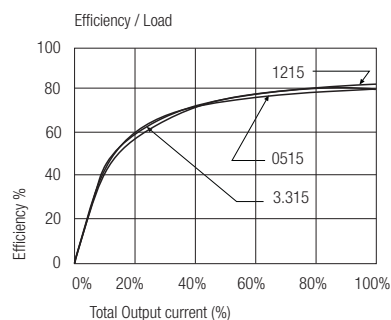
### RB-xx09S



### RB-xx12S



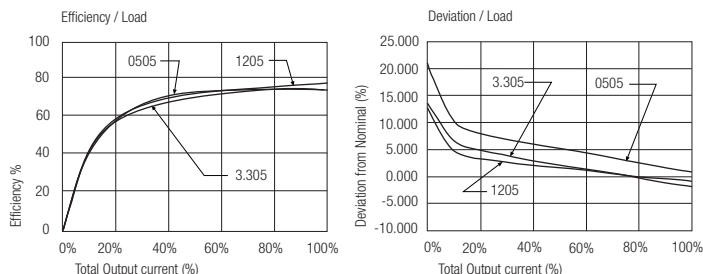
### RB-xx15S



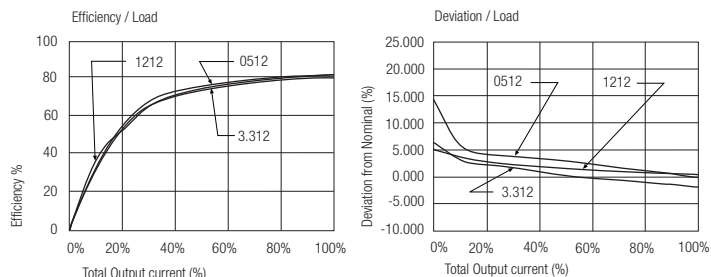


Typical Characteristics - Dual Outputs

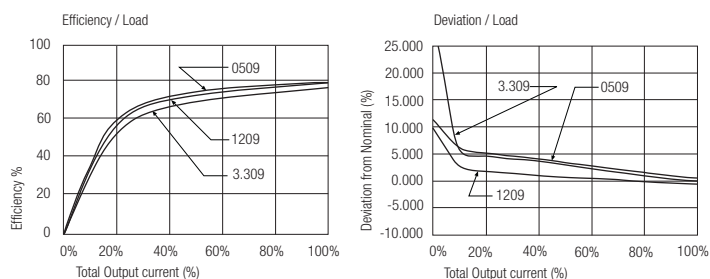
## RB-xx05D



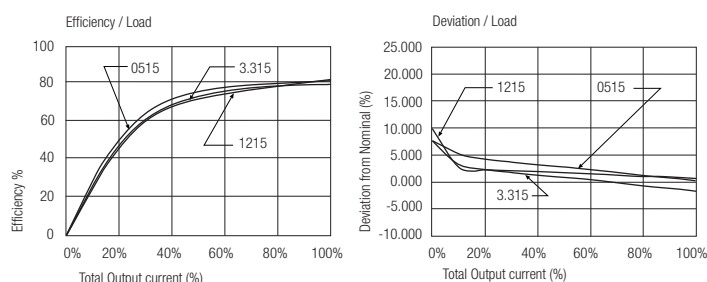
## RB-xx12D



## RB-xx09D



## RB-xx15D



### Notes

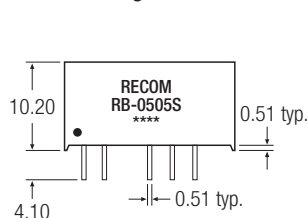
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Certifications

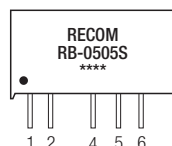
CB Test Report	Report: US/15348/UL	IEC 60950-1:2005 2nd Ed.	UL General Safety	Report: E224736	UL
60950-1 1st Ed.	EN General Safety	Report: PS-R7219C1	EN60950-1:2001 + A11:2004		

### Package Style and Pinning (mm)

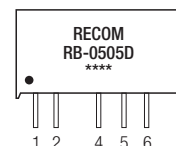
#### 7 PIN SIP Package



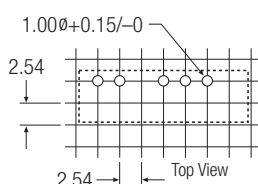
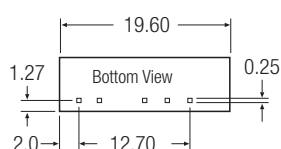
#### Single Output



#### Dual Output



### 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