

## Features

## Unregulated Converters

- Dual Output from a Single Input Rail
- Power Sharing on Output
- Industry Standard Pinout
- 1kVDC & 2kVDC Isolation
- Optional Continuous Short Circuit Protected
- UL94V-0 Package Material
- Efficiency to 85%

**ECONOLINE**

DC/DC-Converter

# RB & RA Series

### Selection Guide

Part Number	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)
SIP 7    DIP 14    (2kV)	(VDC)	(VDC)	(mA)	(%)
RB-xx1.8S    RA-xx1.8S (H)	1.8, 3.3, 5, 9, 12, 15, 24	1.8	555	70
RB-xx3.3S    RA-xx3.3S (H)	1.8, 3.3, 5, 9, 12, 15, 24	3.3	303	75
RB-xx05S    RA-xx05S (H)	1.8, 3.3, 5, 9, 12, 15, 24	5	200	70-78
RB-xx09S    RA-xx09S (H)	1.8, 3.3, 5, 9, 12, 15, 24	9	111	70-78
RB-xx12S    RA-xx12S (H)	1.8, 3.3, 5, 9, 12, 15, 24	12	84	78-80
RB-xx15S    RA-xx15S (H)	1.8, 3.3, 5, 9, 12, 15, 24	15	66	80-84
RB-xx24S    RA-xx24S (H)	1.8, 3.3, 5, 9, 12, 15, 24	24	42	74-85
RB-xx1.8D    RA-xx1.8D (H)	1.8, 3.3, 5, 9, 12, 15, 24	±1.8	±278	70
RB-xx3.3D    RA-xx3.3D (H)	1.8, 3.3, 5, 9, 12, 15, 24	±3.3	±152	70
RB-xx05D    RA-xx05D (H)	1.8, 3.3, 5, 9, 12, 15, 24	±5	±100	70-78
RB-xx09D    RA-xx09D (H)	1.8, 3.3, 5, 9, 12, 15, 24	±9	±56	76-79
RB-xx12D    RA-xx12D (H)	1.8, 3.3, 5, 9, 12, 15, 24	±12	±42	78-82
RB-xx15D    RA-xx15D (H)	1.8, 3.3, 5, 9, 12, 15, 24	±15	±33	80-84
RB-xx24D    RA-xx24D (H)	1.8, 3.3, 5, 9, 12, 15, 24	±24	±21	80-84

xx = Input Voltage

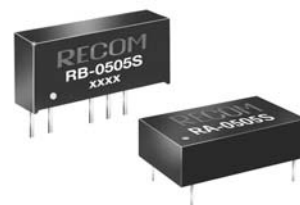
\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RB-0505S/P, RB-0505S/HP

### Specifications (Core Operating Area)

Input Voltage Range			±10%
Output Voltage Accuracy			±5%
Line Voltage Regulation			1.2%/1% of Vin typ.
Load Voltage Regulation (10% to 100% full load)	1.8V, 3.3V output types		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		±75mVp-p max.
Operating Frequency			50kHz min. / 100kHz typ. / 105kHz max.
Efficiency at Full Load			70% min. / 80% typ.
No Load Power Consumption	Single	101mW min. / 126mW typ. / 238mW max.	
	Dual	87mW min. / 130mW typ. / 228mW max.	
Isolation Voltage (tested for 1 second)			1000VDC min.
Rated Working Voltage (long term isolation)			see Application Notes
Isolation Voltage (tested for 1 second)	H-Suffix		2000VDC min.
Rated Working Voltage (long term isolation)	H-Suffix		see Application Notes
Isolation Capacitance			20pF min. / 75pF max.
Isolation Resistance			10 GΩ min.
Short Circuit Protection			1 Second
P-Suffix			Continuous
Operating Temperature Range (free air convection)			-40°C to +85°C (see Graph)

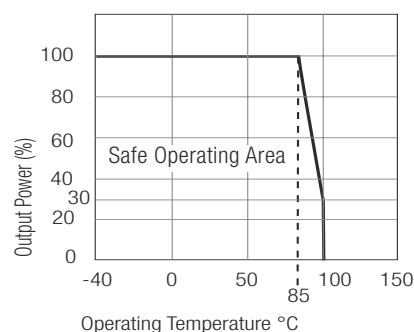
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## 1 Watt SIP7 & DIP14 Single & Dual Output



**RECOM**

## Derating-Graph (Ambient Temperature)



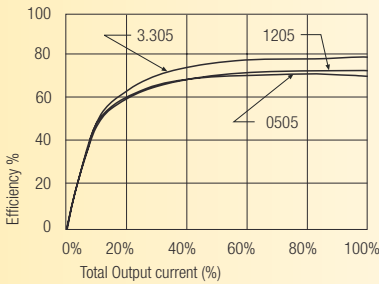
## Specifications (Core Operating Area)

Storage Temperature Range	-55°C to +125°C		
Relative Humidity	95% RH		
Package Weight	RB types	2.2g	
	RA types	2.6g	
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

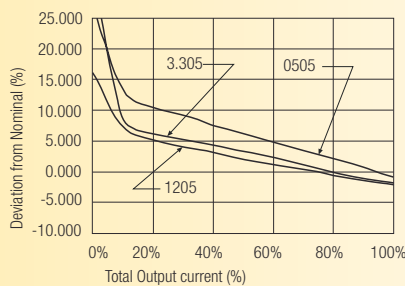
## Typical Characteristics

### RB/RA-xx05S

Efficiency / Load

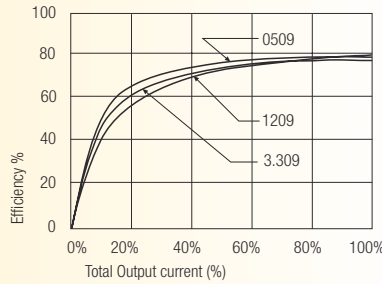


Deviation / Load

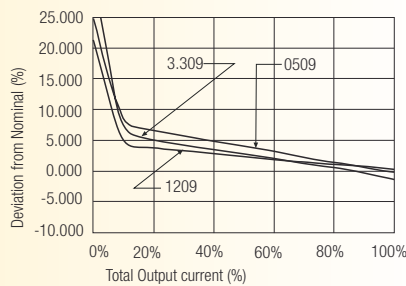


### RB/RA-xx09S

Efficiency / Load

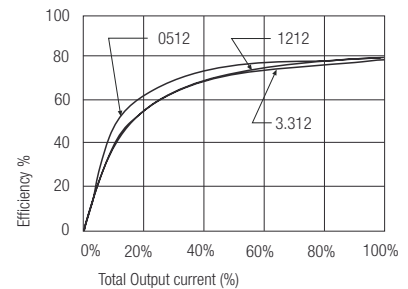


Deviation / Load

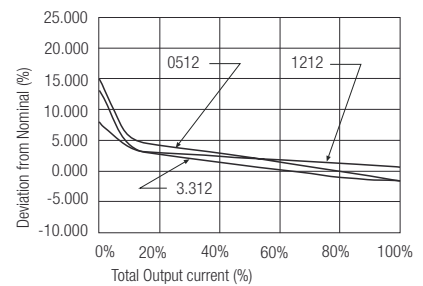


### RB/RA-xx12S

Efficiency / Load

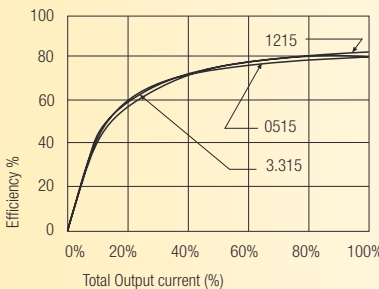


Deviation / Load

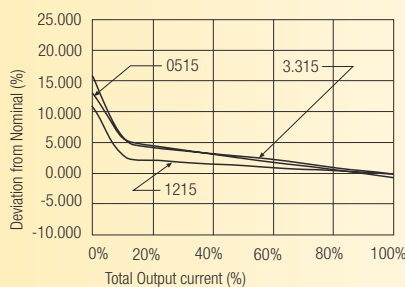


### RB/RA-xx15S

Efficiency / Load

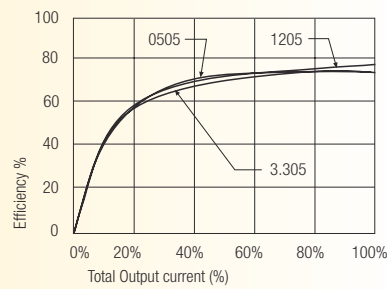


Deviation / Load

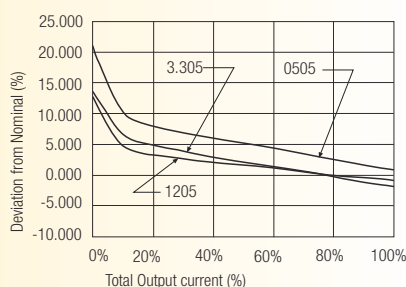


### RB/RA-xx05D

Efficiency / Load

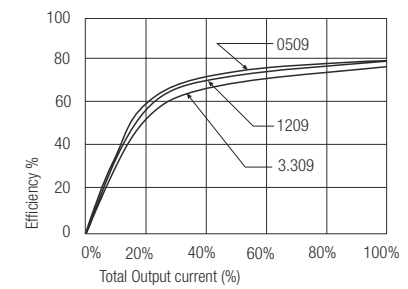


Deviation / Load

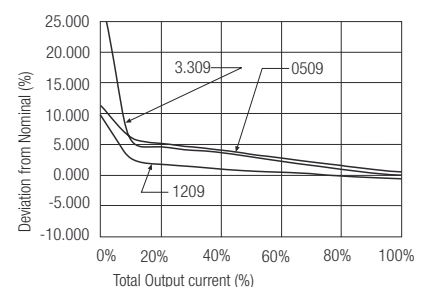


### RB/RA-xx09D

Efficiency / Load

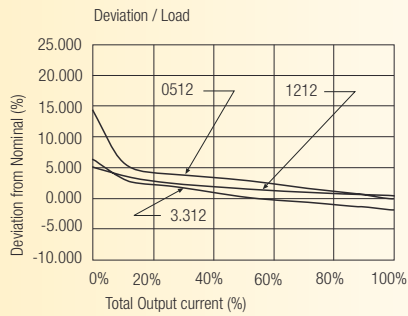
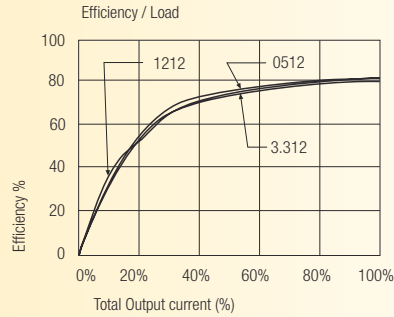


Deviation / Load

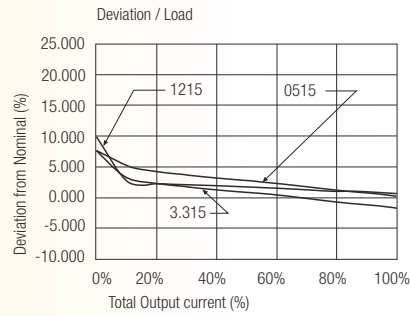
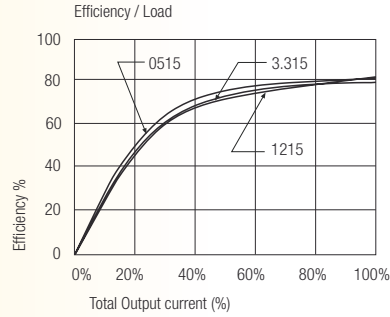


**Typical Characteristics**

**RB/RA-xx12D**

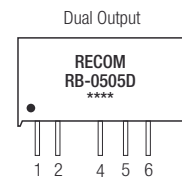
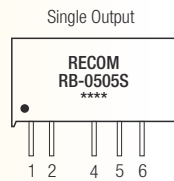
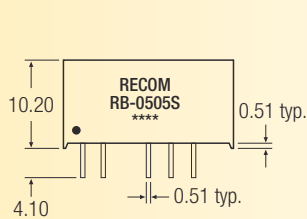


**RB/RA-xx15D**

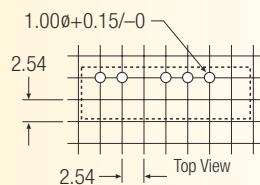
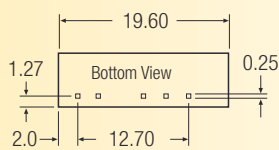


**Package Style and Pinning (mm)**

**7 PIN SIP Package**



**Recommended Footprint Details**



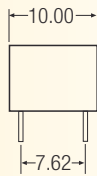
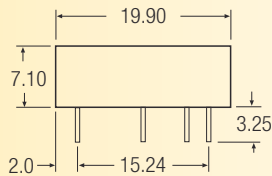
**Pin Connections**

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

**Package Style and Pinning (mm)**

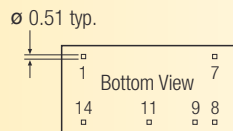
**14 PIN DIP Package**



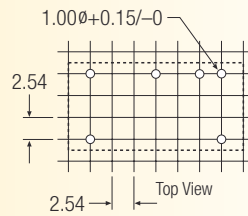
Single Output



Dual Output



**Recommended Footprint Details**



**Pin Connections**

Pin #	Single	Dual
1	-Vin	-Vin
7	NC	NC
8	-Vout	Com
9	+Vout	+Vout
11	NC	-Vout
14	+Vin	+Vin

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