

## Features

### Unregulated Converters

- Industry Standard Pinout
- 1kVDC & 2kVDC Isolation
- UL94V-0 Package Material
- Toroidal Magnetics
- Fully Encapsulated
- Custom Solutions Available
- Efficiency to 85%

**ECONOLINE**

DC/DC-Converter

## RO & RE Series

### Selection Guide

Part Number	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)
SIP 4      SIP 7      (2kV)				
RO-xx1.8S    RE-xx1.8S    (H)	1.8, 3.3, 5, 9, 12, 15, 24	1.8	555	70
RO-xx3.3S    RE-xx3.3S    (H)	1.8, 3.3, 5, 9, 12, 15, 24	3.3	303	75
RO-xx05S     RE-xx05S     (H)	1.8, 3.3, 5, 9, 12, 15, 24	5	200	70-78
RO-xx09S     RE-xx09S     (H)	1.8, 3.3, 5, 9, 12, 15, 24	9	111	76-78
RO-xx12S     RE-xx12S     (H)	1.8, 3.3, 5, 9, 12, 15, 24	12	83	78-80
RO-xx15S     RE-xx15S     (H)	1.8, 3.3, 5, 9, 12, 15, 24	15	66	80-84
RO-xx24S     RE-xx24S     (H)	1.8, 3.3, 5, 9, 12, 15, 24	24	42	74-85

xx = Input Voltage

\*add Suffix "P" for Continuous Short Circuit Protection

### Specifications (Core Operating Area)

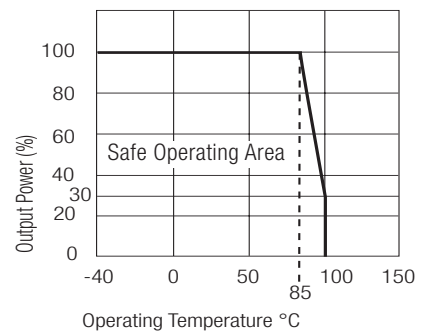
Input Voltage Range				±10%
Output Voltage Accuracy				±5%
Line Voltage Regulation				1.2%/1% of Vin max.
Load Voltage Regulation (10% to 100% full load)	1.8V, 3.3V output types			20% max.
	5V output type			15% max.
	9V, 12V, 15V, 24V output types			10% max.
Output Ripple and Noise (20MHz limited)				100mVp-p max.
Operating Frequency				50kHz min. / 100kHz typ. / 105kHz max.
Efficiency at Full Load				70% min. / 80% typ.
No Load Power Consumption				101mW min. / 126mW typ. / 171mW max.
Isolation Voltage (tested for 1 second)				1.000VDC min.
Rated Working Voltage (long term isolation)				see Application Notes
Isolation Voltage (tested for 1 second)	H-Suffix			2.000VDC 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)
Storage Temperature Range				-55°C to +125°C
Relative Humidity	MSL Level 1			95% RH
Package Weight	RO types			1.4g
	RE types			2.2g
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F	RO types	985 x 10 <sup>3</sup> hours
			RE types	992 x 10 <sup>3</sup> hours
(+85°C)		using MIL-HDBK 217F	RO types	200 x 10 <sup>3</sup> hours
			RE types	145 x 10 <sup>3</sup> hours

## 1 Watt SIP4 & SIP7 Single Output



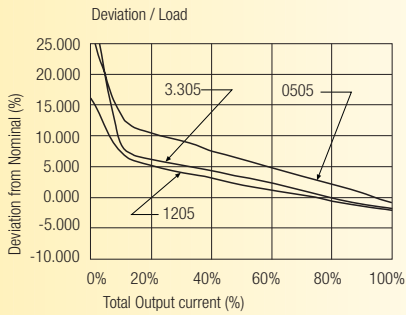
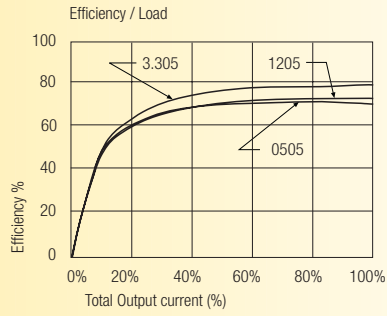
**RECOM**

## Derating-Graph (Ambient Temperature)

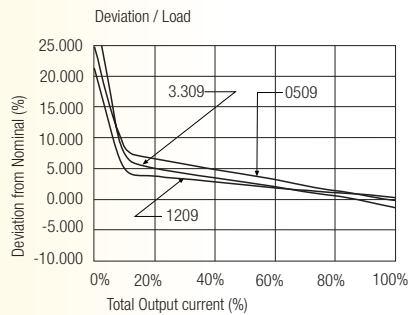
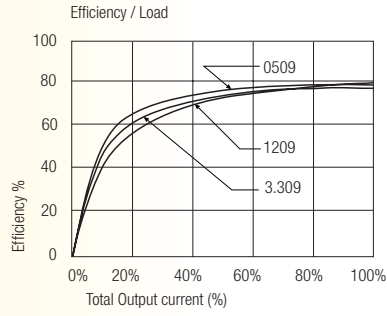


**Typical Characteristics**

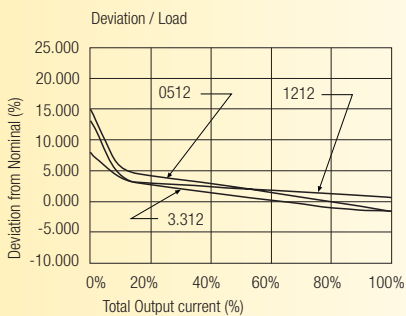
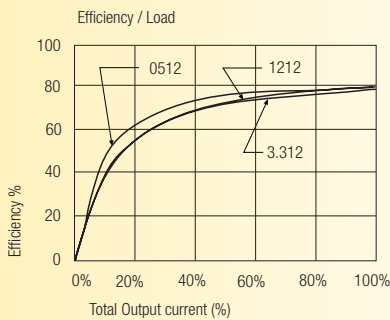
**RO/RE-xx05S**



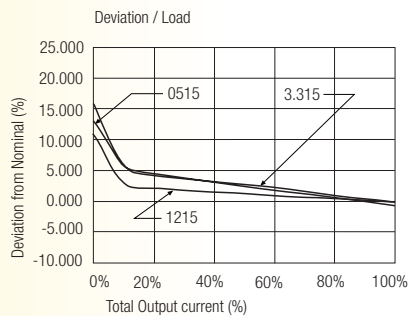
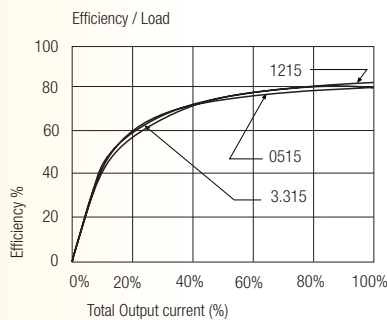
**RO/RE-xx09S**



**RO/RE-xx12S**

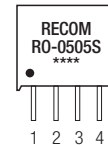
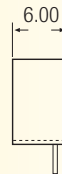
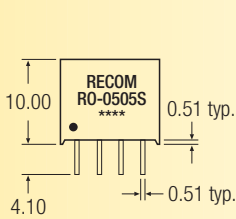


**RO/RE-xx15S**

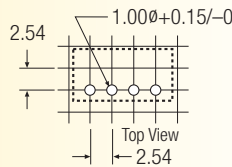
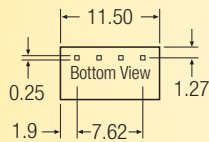


**Package Style and Pinning (mm)**

**4 PIN SIP Package**



**Recommended Footprint Details**

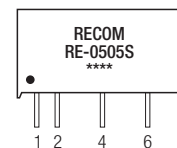
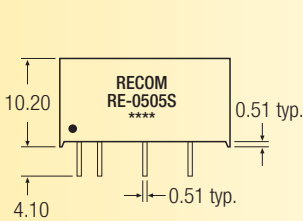


**RO Pin Connections**

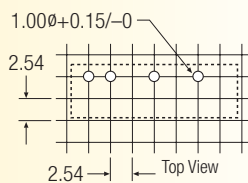
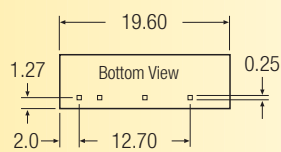
Pin #	Single
1	-Vin
2	+Vin
3	-Vout
4	+Vout

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

**7 PIN SIP Package**



**Recommended Footprint Details**



**RE Pin Connections**

Pin #	Single
1	+Vin
2	-Vin
4	-Vout
6	+Vout

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm