

## Features

## Unregulated Converters

- Safety standards and approval: EN 60950 certified, rated for 250VAC (LVD test report)
- Optional Continuous Short Circuit Protected
- 3kVDC & 4kVDC Isolation
- Custom Solutions Available
- UL94V-O Package Material
- Efficiency to 84%

## ECONOLINE DC/DC-Converter

# RK & RH Series

### Selection Guide

Part Number		Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)
SIP 7	(4kV)	(VDC)	(VDC)	(mA)	(%)
RK-xx1.8S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	1.8	555	70
RK-xx3.3S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	3.3	303	75
RK-xx05S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	5	200	70-78
RK-xx09S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	9	111	70-80
RK-xx12S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	12	84	78-82
RK-xx15S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	15	66	80-82
RK-xx24S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	24	42	74-83
RH-xx1.8D	(H)	1.8, 3.3, 5, 9, 12, 15, 24	±1.8	±278	70
RH-xx3.3D	(H)	1.8, 3.3, 5, 9, 12, 15, 24	±3.3	±152	70
RH-xx05D	(H)	1.8, 3.3, 5, 9, 12, 15, 24	±5	±100	74-78
RH-xx09D	(H)	1.8, 3.3, 5, 9, 12, 15, 24	±9	±56	76-79
RH-xx12D	(H)	1.8, 3.3, 5, 9, 12, 15, 24	±12	±42	78-84
RH-xx15D	(H)	1.8, 3.3, 5, 9, 12, 15, 24	±15	±33	80-84
RH-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. RK-0505S/P, RK-0505S/HP

## 1 Watt SIP7 Single & Dual Output



EN-60950-1 Certified  
EN-60601-1 Certified



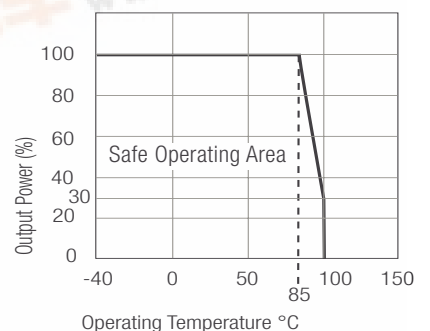
### Specifications (Core Operating Area)

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	RK types	50kHz min. / 100kHz typ. / 105kHz max.
	RH types	57kHz min. / 100kHz typ. / 105kHz max.
Efficiency at Full Load		70% min. / 80% typ.
No Load Power Consumption	RK types	101mW min. / 126mW typ. / 238mW max.
	RH types	87mW min. / 130mW typ. / 228mW max.
Isolation Voltage (tested for 1 second)		3000VDC min.
Rated Working Voltage (long term isolation)		see Application Notes
Isolation Voltage (tested for 1 second)	H-Suffix	4000VDC min.
Rated Working Voltage (long term isolation)	H-Suffix	see Application Notes
Isolation Capacitance	RK types	20pF min. / 75pF max.
	RH types	20pF min. / 65pF max.
Isolation Resistance		15 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

## Derating-Graph (Ambient Temperature)



continued on next page



# ECONOLINE

## DC/DC-Converter

# RK & RH Series

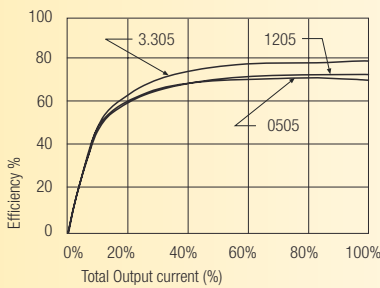
### Specifications (Core Operating Area)

Relative Humidity	95% RH		
Package Weight	2.6g		
H-Suffix	2.8g		
MTBF (+25°C)	using MIL-HDBK 217F	RK types	992 x 10 <sup>3</sup> hours
	RH types		1012 x 10 <sup>3</sup> hours
<i>Detailed Information see Application Notes chapter "MTBF"</i>			
(+85°C)	using MIL-HDBK 217F	RK types	145 x 10 <sup>3</sup> hours
	RH types		151 x 10 <sup>3</sup> hours

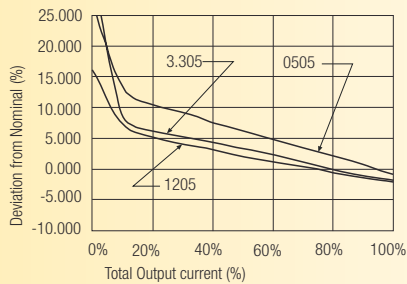
### Typical Characteristics

#### RK-xx05S

Efficiency / Load

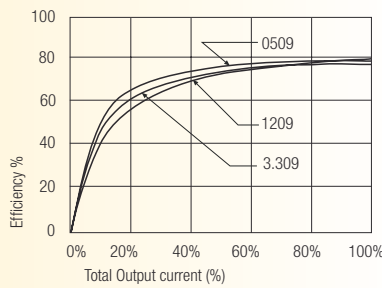


Deviation / Load

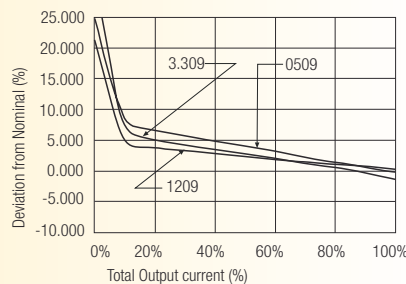


#### RK-xx09S

Efficiency / Load

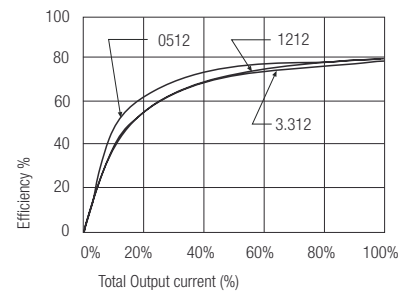


Deviation / Load

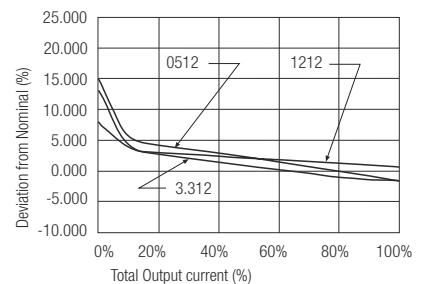


#### RK-xx12S

Efficiency / Load

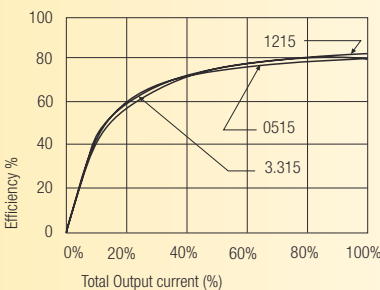


Deviation / Load

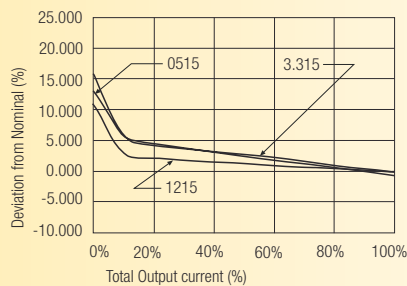


#### RK-xx15S

Efficiency / Load

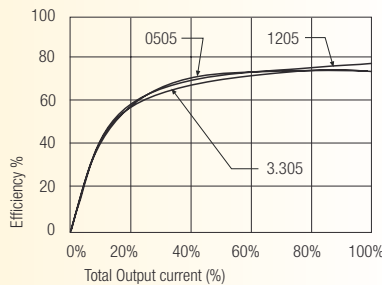


Deviation / Load

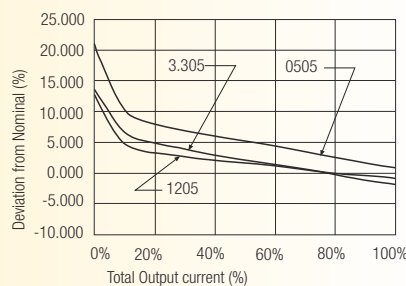


#### RH-xx05D

Efficiency / Load

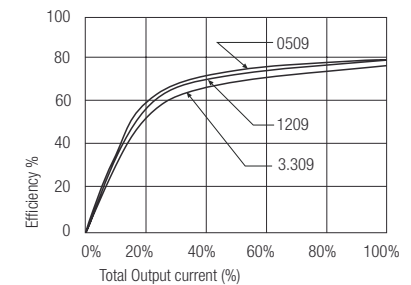


Deviation / Load

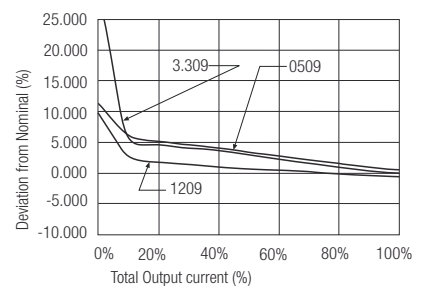


#### RH-xx09D

Efficiency / Load

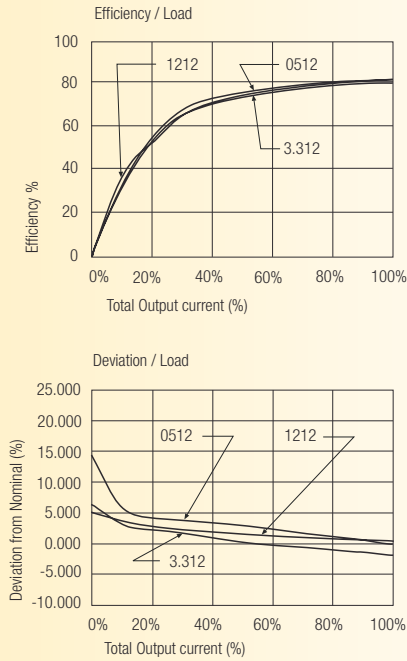


Deviation / Load

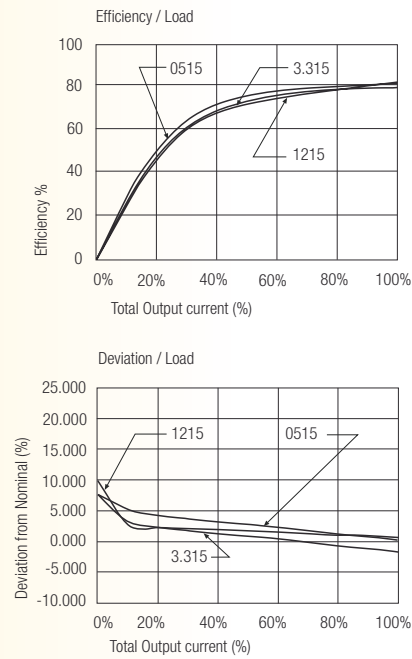


## Typical Characteristics

### RH-xx12D



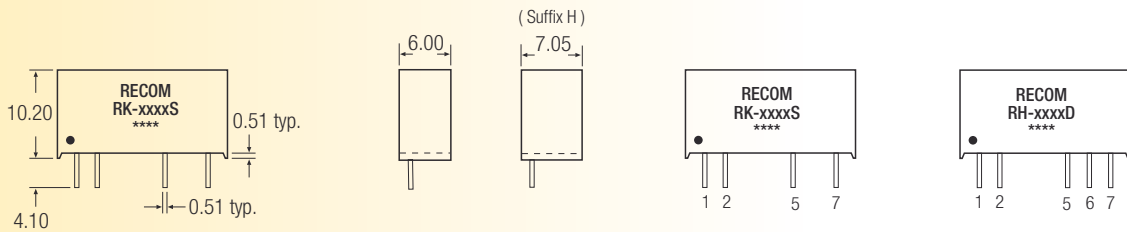
### RH-xx15D



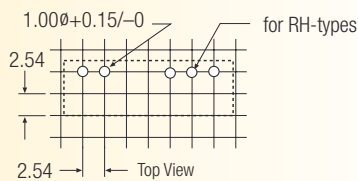
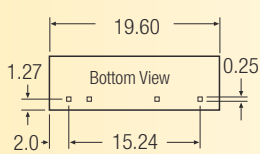
## Package Style and Pinning (mm)

### 7 PIN SIP Package

3rd angle projection



### Recommended Footprint Details



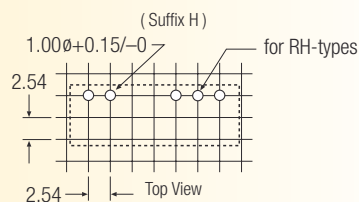
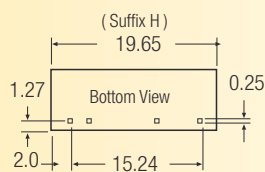
### Pin Connections RK-xxxxS

Pin #	Single
1	+Vin
2	-Vin
5	-Vout
7	+Vout

### Pin Connections RH-xxxxD

Pin #	Dual
1	+Vin
2	-Vin
5	-Vout
6	Com
7	+Vout

### Recommended Footprint Details



XX.X ± 0.5 mm  
XX.XX ± 0.25 mm