

## Features

### Unregulated Converters

- Safety standards and approval: EN 60950 certified, rated for 250VAC (LVD test report)
- Power Sharing on Dual Output
- 3kVDC & 4kVDC Isolation
- Custom Solutions Available
- UL94V-0 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	76-79
RK-xx12S	(H)	1.8, 3.3, 5, 9, 12, 15, 24	12	84	78-79
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	80-82
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

### 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 5V output type 9V, 12V, 15V, 24V output types	20% max. 15% max. 10% max.
Output Ripple and Noise (20MHz limited)	Single output types Dual output types	100mVp-p max. ±75mVp-p max.
Operating Frequency	RK types RH types	50kHz min. / 100kHz typ. / 105kHz max. 57kHz min. / 100kHz typ. / 105kHz max.
Efficiency at Full Load		70% min. / 80% typ.
No Load Power Consumption	RK types RH types	101mW min. / 126mW typ. / 171mW max. 87mW min. / 130mW typ. / 190mW max.
Isolation Voltage (tested for 1 second)		3.000VDC min.
Rated Working Voltage (long term isolation)		see Application Notes
Isolation Voltage (tested for 1 second)	H-Suffix	4.000VDC min.
Rated Working Voltage (long term isolation)	H-Suffix	see Application Notes.
Isolation Capacitance	RK types RH types	20pF min. / 75pF max. 20pF min. / 65pF max.
Isolation Resistance		15 GΩ min.
Short Circuit Protection		1 Second
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

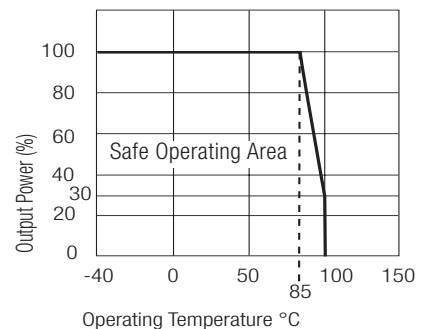
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## 1 Watt SIP7 Single & Dual Output



**RECOM**

## Derating-Graph (Ambient Temperature)



**Specifications (Core Operating Area)**

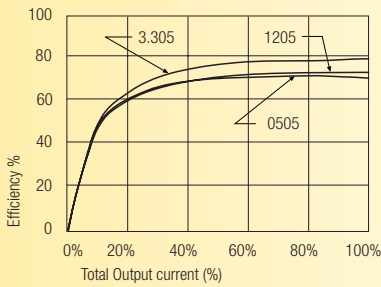
Package Weight	2.6g
H-Suffix	2.8g
MTBF (+25°C) (+85°C)	using MIL-HDBK 217F RK types 992 x 10 <sup>3</sup> hours RH types 1012 x 10 <sup>3</sup> hours
	using MIL-HDBK 217F RK types 145 x 10 <sup>3</sup> hours RH types 151 x 10 <sup>3</sup> hours

*Detailed Information see Application Notes chapter "MTBF"*

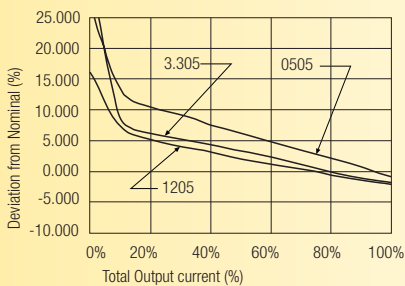
**Typical Characteristics**

**RK-xx05S**

Efficiency / Load

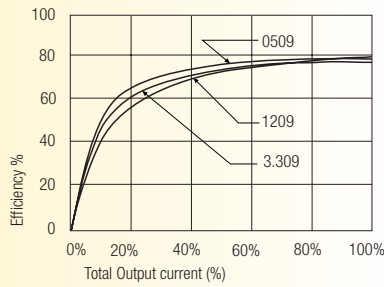


Deviation / Load

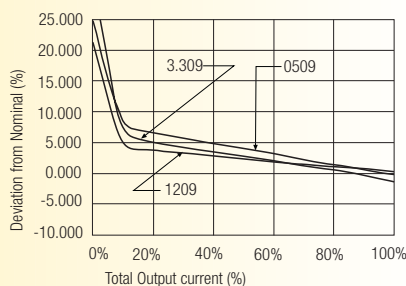


**RK-xx09S**

Efficiency / Load

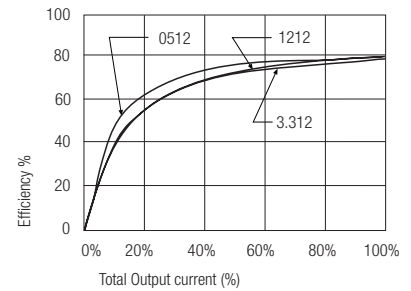


Deviation / Load

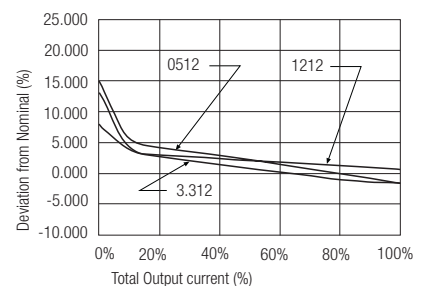


**RK-xx12S**

Efficiency / Load

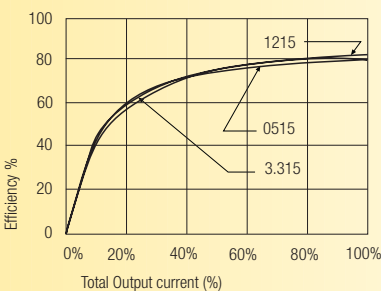


Deviation / Load

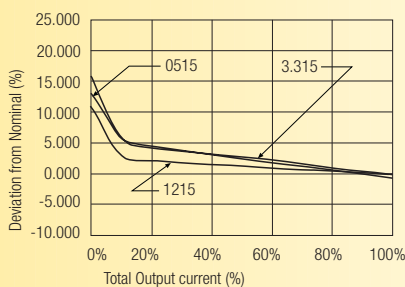


**RK-xx15S**

Efficiency / Load

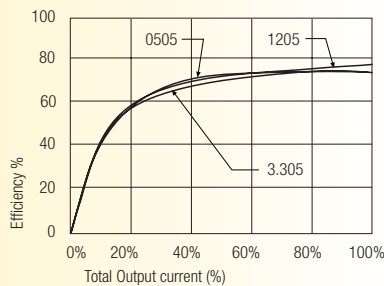


Deviation / Load

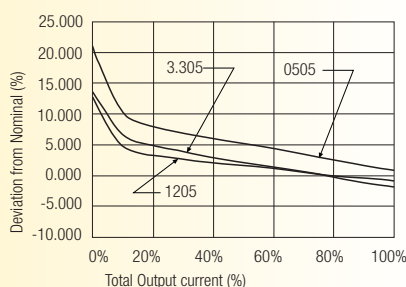


**RH-xx05D**

Efficiency / Load

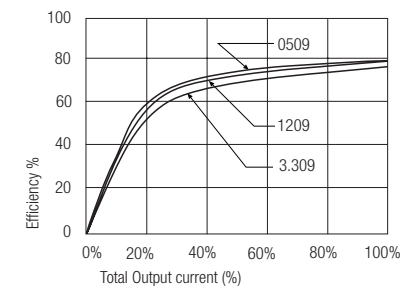


Deviation / Load

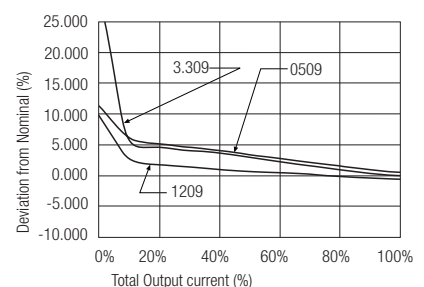


**RH-xx09D**

Efficiency / Load

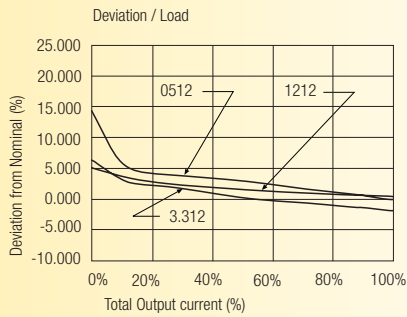
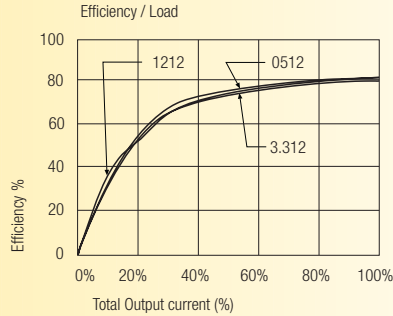


Deviation / Load

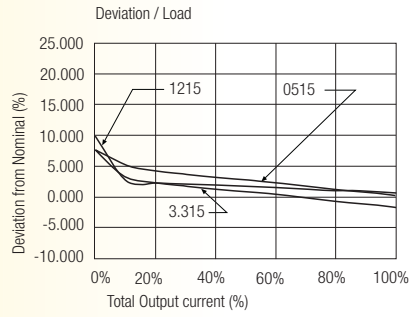
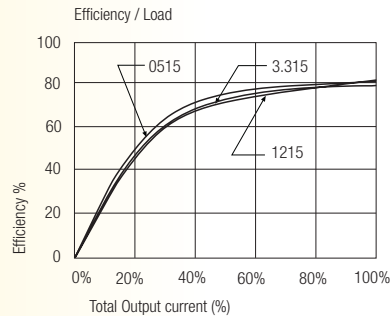


**Typical Characteristics**

**RH-xx12D**

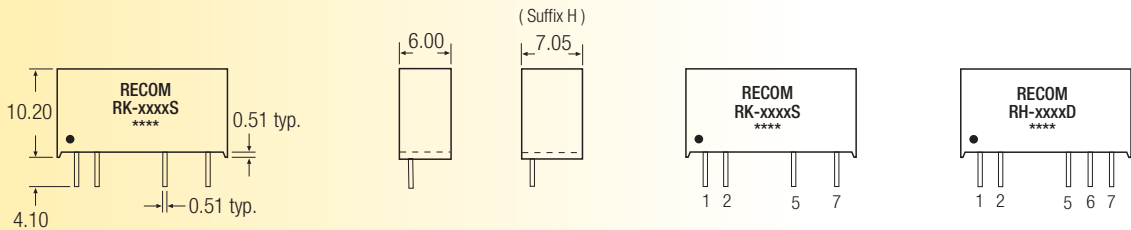


**RH-xx15D**

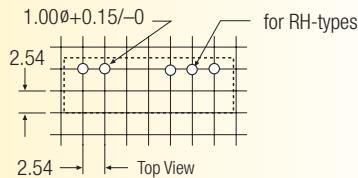
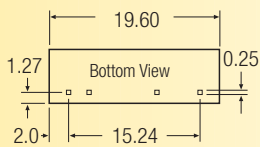


**Package Style and Pinning (mm)**

**7 PIN SIP Package**



**Recommended Footprint Details**



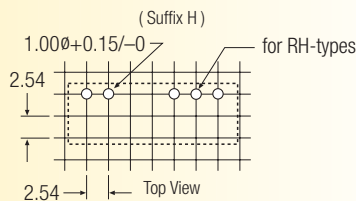
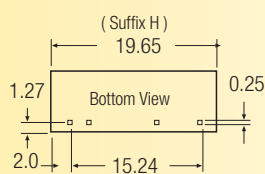
**Pin Connections  
RK-xxxxS**

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