

# Features

## Unregulated Converters

- Efficiency 80% Full Load/65% with 20% Load
- 1:1 Input Range
- 1kVDC and 2kVDC Isolation Option
- EN pending & UL Certified
- -40°C to +100°C Operating Temperature Range
- 1W SMD Package

### Description

The R1S/E series is an unregulated DC/DC converter in fully encapsulated SMD package style. This series has been designed to offer exceptionally high efficiency at low loads and an extended operating temperature range. Uses include battery powered supplies, green energy applications and general isolating/converting DC power where board space and high efficiency is a premium.

### Selection Guide

Part Number SMD	Isolation Voltage (kVDC)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (typ.)	Capacitive Load (max.)
R1S**-3.305/E*	1	3.3	5	200	80%	2200µF
R1S**-0505/E*	1	5	5	200	80%	2200µF
R1S**-1205/E*	1	12	5	200	80%	2200µF
R1S**-2405/E*	1	24	5	200	80%	2200µF

\*\* without marking denotes 5 pins out of 8 fitted (includes /H option) - e.g. R1S-3.305/EH

\*\* with marking "8" denotes 8 pins out of 8 fitted (/H option not available) - e.g. R1S8-3.305/E

\* add Suffix "/H" for 2kVDC Isolation Voltage - e.g. R1S-3.305/EH

\* add Suffix "/P" for Continuous Short Protection - e.g. R1S-3.305/EHP, R1S8-3.305/EP

\* add Suffix "-R" for tape & reel packing - e.g. R1S-3.305/EHP-R, R1S8-3.305/E-R

### 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	3.3V	$\pm 10\%$ max.	
	5V, 12V, 24V	$\pm 5\%$ max.	
Line Voltage Regulation	3.3V	1.5% max.	
(low line to high line at full load)	5V, 12V, 24V	1.2% max.	
Load Voltage Regulation	Load Deviation 10% to 100%		15% max.
Output Ripple and Noise (20MHz BW)			50mVp-p typ., 100mVp-p max.
Operating Frequency ( $V_{in}$ =nominal input)			20kHz min. / 90kHz max.
Efficiency	see Selection Guide		
Minimum Load = 0%	Specifications valid for 10% minimum load only		
Isolation Voltage	R1S-xx05/E	tested for 1 second	1000 VDC
	R1S-xx05/EH	tested for 1 second	2000 VDC
Isolation Capacitance			75pF max.
Isolation Resistance	( $V_{iso}=500V$ )	10GΩ min.	
Short-Circuit Protection	1 second		
Operating Temperature Range	-40°C to +100°C		
Storage Temperature	-55°C to +125°C		
Reflow Temperature	RoHS compliant	245°C (30 sec.), Peak 255°C (5sec.) max.	
Vapour Phase Process	(for more details see Application Notes)		230°C (90 sec.) max.
Relative Humidity	95% RH		
Package Weight	(R1S8/xx05/E = 1.1g)	1.0g	
Packing Quantity			40 pcs per Tube
			500 pcs per Reel
MTBF (+25°C)	using MIL-HDBK 217F	3459 x 10 <sup>3</sup> hours	
MTBF (+100°C)	using MIL-HDBK 217F	756 x 10 <sup>3</sup> hours	

Note: Detailed Information see Application Notes chapter "MTBF"

# ECONOLINE

## DC/DC-Converter

with 3 year Warranty



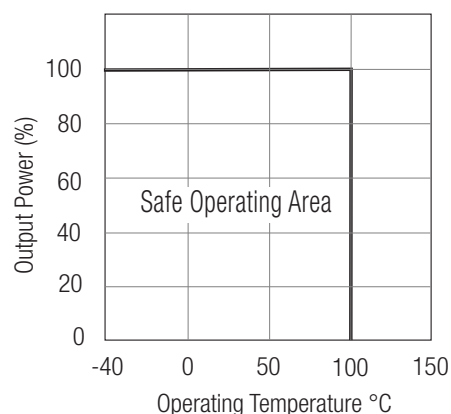
## 1 Watt SMD Single Output



**EN-60950-1 (pending)**  
**UL-60950-1 Certified**

# R1S/E

## Derating-Graph (Ambient Temperature)



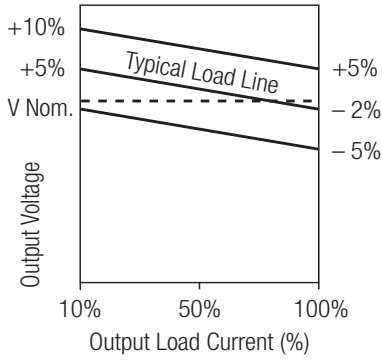
Refer to Application Notes

## ECONOLINE

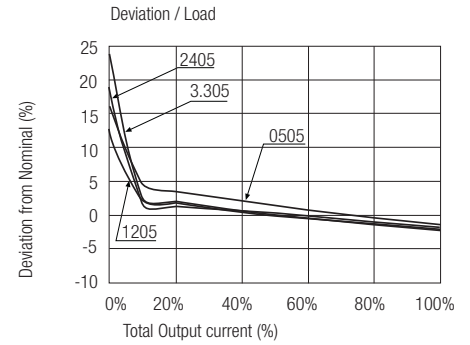
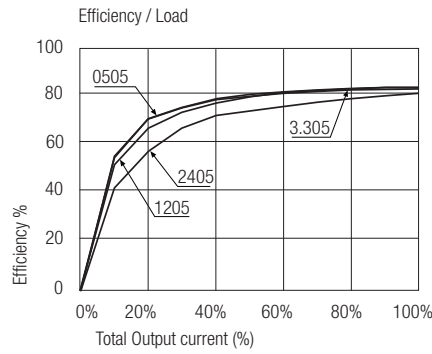
DC/DC-Converter

### Typical Characteristics

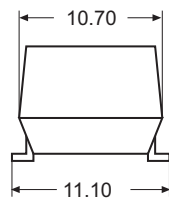
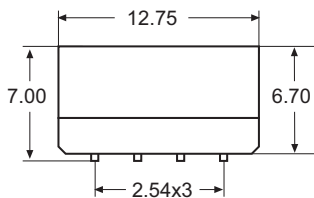
#### Tolerance Envelope



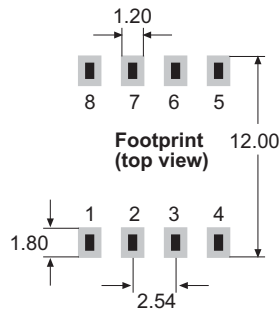
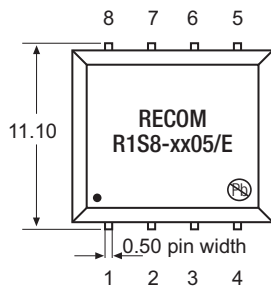
## R1S-xx05/E



### Package Style and Pinning



#### 8 Pins:



Pin Connections	Function	Function
Pin #	5 Pins	8 Pins
1	-Vin	-Vin
2	+Vin	+Vin
4	-Vout	-Vout
5	+Vout	+Vout
3,6,7	NA	NC
8	NC	NC

NC = No Internal Connection  
NA = No Available Connection

Unit: mm  
Tolerance:  $\pm 0.25$  mm

#### 5 Pins:

