

## Features

- Industry standard pinout
- 1kVDC/1s or 2kVDC/1s isolation option
- Efficiency up to 85%

## Unregulated Converters

- Optional continuous short circuit protection
- Fully encapsulated
- UL94V-0 package material

## RE

1 Watt  
 SIP7  
 Single Output



### Description

The RE DC/DC converters are typically used in general purpose power isolation and voltage matching applications, and feature a full industrial operating temperature range of -40°C to +85°C without derating.

### Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	max. Capacitive Load <sup>(2)</sup> [µF]
RE-xx3.3S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	3.3	303	75	2200
RE-xx05S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	5	200	78-80	2200
RE-xx09S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	9	111	78-80	1000
RE-xx12S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	12	83	80-84	470
RE-xx15S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	15	66	80-84	470
RE-xx24S <sup>(3,4)</sup>	3.3, 5, 12, 15, 24	24	42	78-85	220

#### Notes:

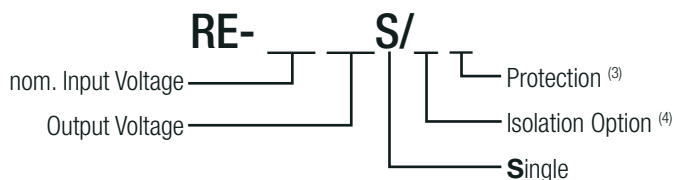
Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: Max Cap Load is tested at nominal input and full resistive load and is defined as the capacitive load that will allow start up in under 1s without damage to the converter



UL60950-1 certified  
 CAN/CSA-C22.2 No 60950-1 certified  
 IEC/EN60950-1 certified  
 EN55032 compliant  
 CB report

### Model Numbering



#### Notes:

Note3: standard part is without Continuous Short Circuit Protection  
 add suffix „/P“ for Continuous Short Circuit Protection

Note4: add suffix „/H“ for 2kVDC/1s Isolation  
 or add suffix „/HP“ for 2kVDC/1s Isolation and Continuous Short Circuit Protection

#### Ordering Examples:

RE-123.3S/P: 12V Input Voltage, 3.3V Output Voltage, Single Output with continuous short circuit protection

RE-0509S/HP: 5V Input Voltage, 9V Output Voltage, Single Output with 2kVDC/1s isolation and continuous short circuit protection

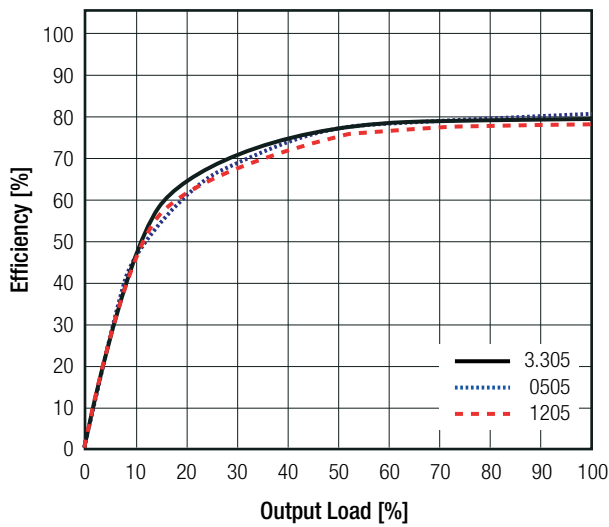
Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

### BASIC CHARACTERISTICS

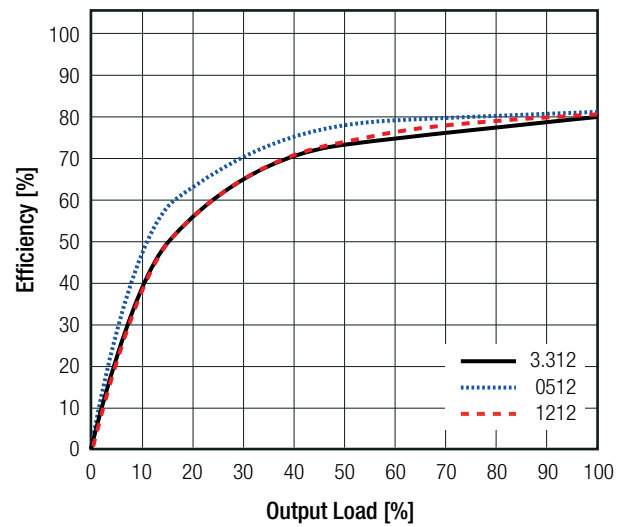
Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				capacitors
Input Voltage Range			±10%	
Minimum Load <sup>(1)</sup>		0%		
Internal Operating Frequency		50kHz	100kHz	105kHz
Output Ripple and Noise	20MHz BW			100mVp-p

### Efficiency vs. Load

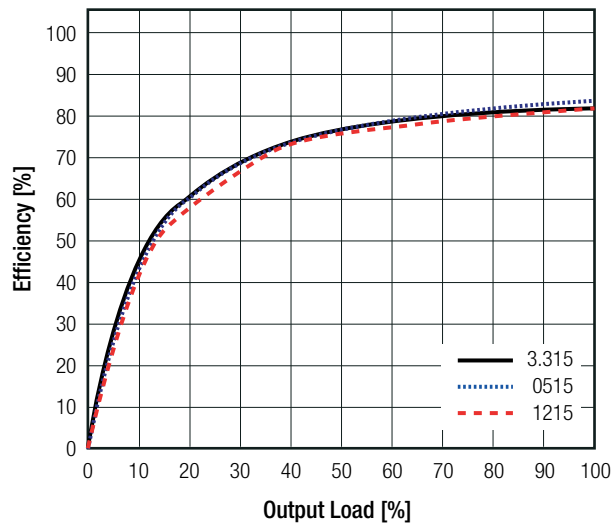
RE-xx05S



RE-xx12S



RE-xx15S



### REGULATIONS

Parameter	Condition	Value
Output Accuracy		±5.0% max.
Line Regulation	low line to high line	±1.2% of 1.0% Vin typ.

continued on next page

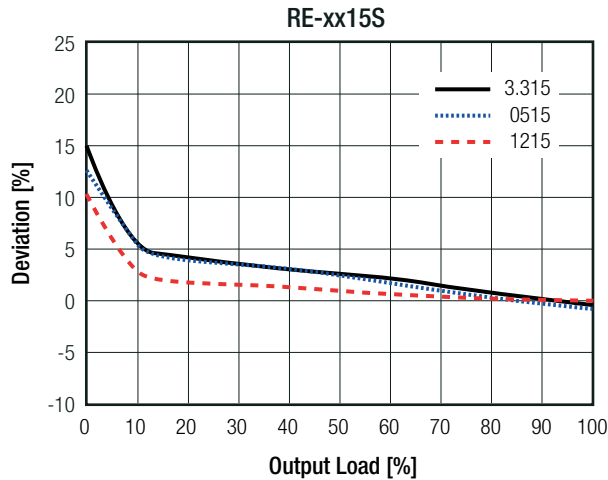
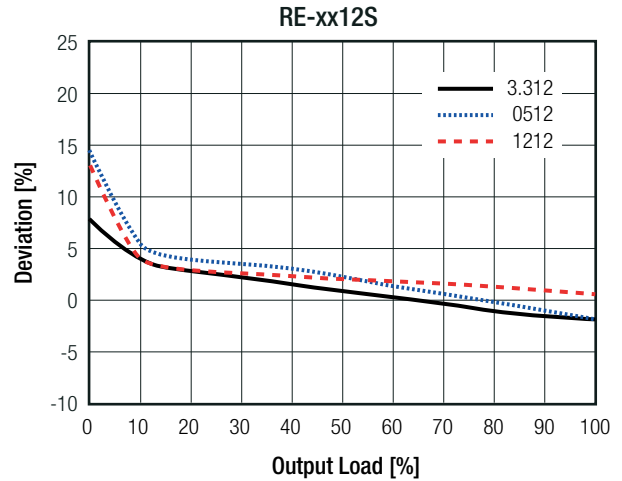
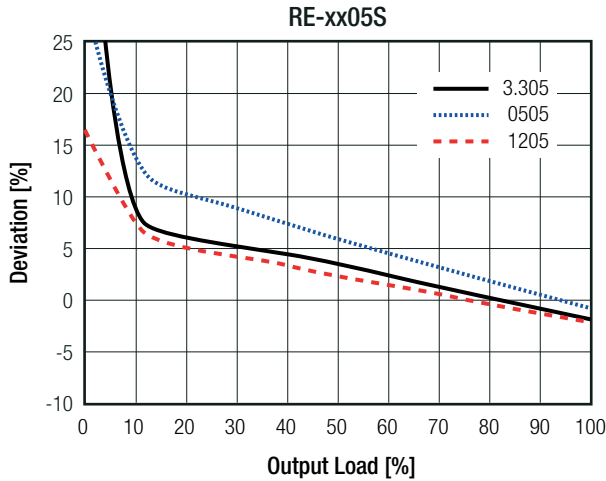
**Specifications** (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

Parameter	Condition		Value
Load Regulation <sup>(5)</sup>	10% to 100% load	3.3Vout	20.0% max.
		5Vout	15.0% max.
		9, 12, 15, 24Vout	10.0% max.

**Notes:**

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

**Deviation vs. Load**



**PROTECTIONS**

Parameter	Type		Value
Short Circuit Protection (SCP)	without suffix		1 second
	with suffix "/P"		continuous
Isolation Voltage <sup>(6)</sup>	I/P to O/P	without suffix	1kVDC 500VAC/60Hz
		with suffix "/H"	2kVDC 1kVAC/60Hz
Isolation Resistance			10GΩ min.
Isolation Capacitance			20pF min. / 75pF max.
Insulation Grade			basic (IEC/EN60950-1)
			functional (UL60950-1)

**Notes:**

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

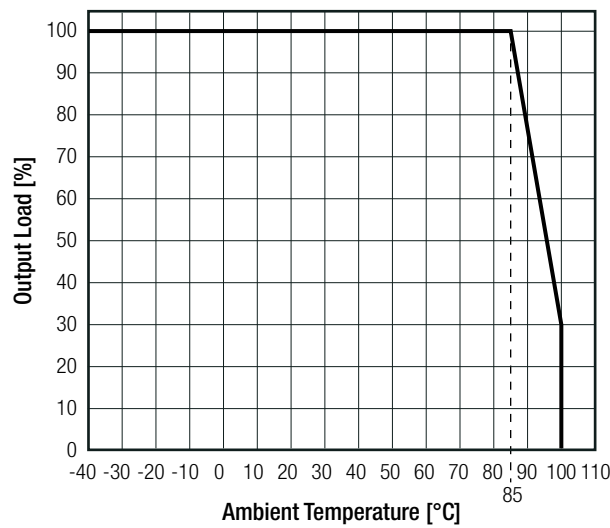
Note7: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

**ENVIRONMENTAL**

Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection (see graph)		-40°C to +85°C
Maximum Case Temperature			+105°C
Temperature Coefficient			±0.03%/K typ.
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	16400 x 10 <sup>3</sup> hours
		+85°C	8600 x 10 <sup>3</sup> hours

**Derating Graph**  
(@ free air convection)



**SAFETY AND CERTIFICATIONS**

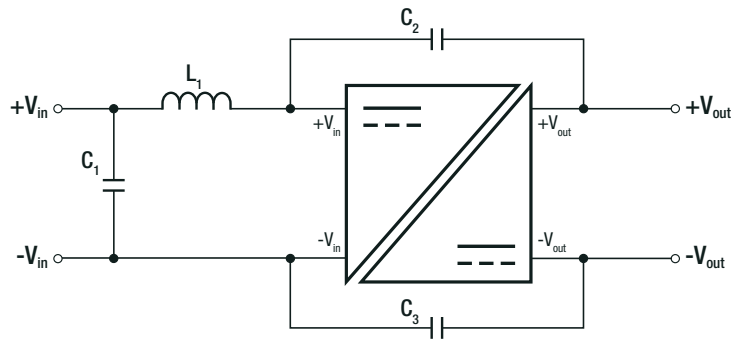
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	SPCLVD1602031	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety	E358085-A4-UL	UL60950-1, 2nd Edition:2007 CAN/CSA C22.2 No. 60950-1-03, 2nd Edition:2007
Information Technology Equipment, General Requirements for Safety (CB)	E322406-A4-CB-1	IEC60950-1:2005, 2nd Edition
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS 2+		RoHS-2011/65/EU + AM-2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter	EN55032, Class A
	(refer to "EMC Filter Suggestion" below)	EN55032, Class B

continued on next page

### Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

#### EMC Filter Suggestion according to EN55032



#### Component List Class A

MODEL	C1	L1	C2 (safety)	C3 (safety)
RE-0505S	4.7µF 50V MLCC	N/A	N/A	N/A
RE-0512S				N/A
RE-2405S				N/A
RE-2415S				2.2nF

#### Component List Class B

MODEL	C1	L1	C2 (safety)	C3 (safety)
RE-0505S	10µF 100V MLCC	<a href="#">22µH choke RLS-226</a>	100pF	330pF
RE-0512S				
RE-2405S				
RE-2415S				

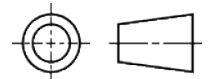
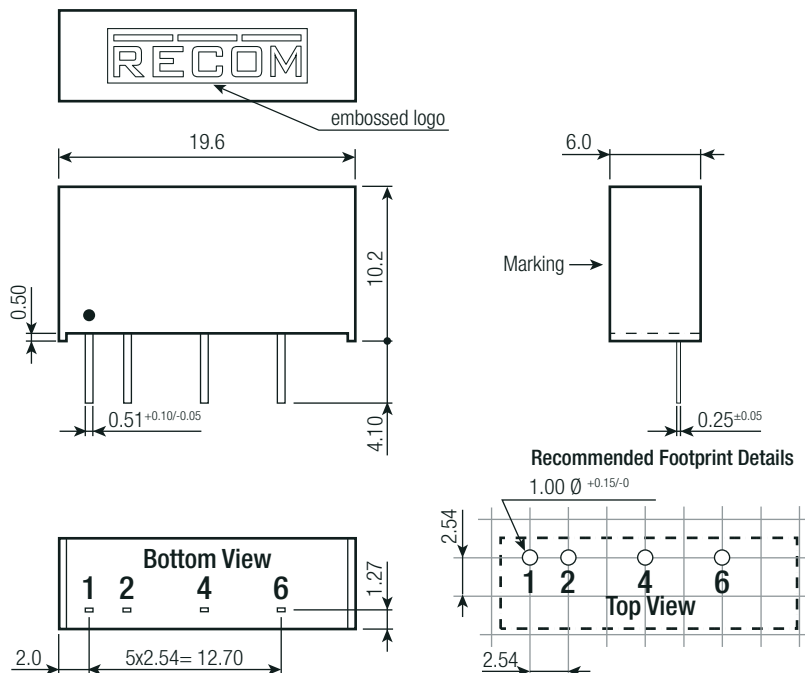
#### Notes:

Note8: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact RECOM tech support for advice

#### DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB	non-conductive black plastic, (UL94 V-0) epoxy, (UL94 V-0) FR4, (UL94 V-0)
Dimension (LxWxH)		19.6 x 6.0 x 10.2mm
Weight		2.2g typ.

#### Dimension Drawing (mm)



#### Pinning Information

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

Tolerance:  
xx.x= ±0.5mm  
xx.xx= ±0.25mm

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	520.0 x 16.0 x 9.0mm
Packaging Quantity	tube	25pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity		95% RH max.

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.