

# Features

## Unregulated Converters

- Low Cost 1W Converter
- Industry Standard Pinout
- SIP4 Package
- 1kVDC Isolation
- Efficiency up to 80%
- Wide Operating Temperature Range -40°C to +85°C
- UL60950-1 Certified

### Description

The ROE 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	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency typ. (%)	max. Capacitive Load <sup>(1)</sup> (µF)
ROE-3.305S	3.3	5	200	79	470
ROE-0505S	5	5	200	79	470
ROE-0512S	5	12	84	80	220
ROE-0515S	5	15	66	80	220
ROE-1205S	12	5	200	80	470
ROE-1505S	15	5	200	79	470
ROE-2405S	24	5	200	80	470

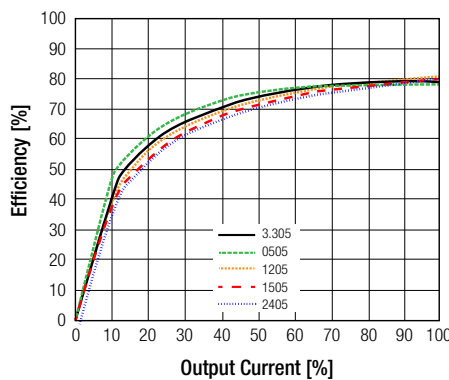
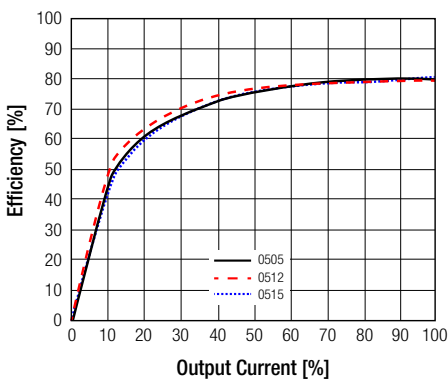
#### Notes:

Note1: Max. capacitive load is tested at nominal input voltage and full load.

### Specifications (measured at T<sub>a</sub>= 25°C, nominal input voltage, full load and after warm up)

BASIC CHARACTERISTICS					
Parameter	Condition	Min.	Typ.	Max.	
Input Voltage Range					±10%
Operating Frequency Range	V <sub>in</sub> nominal	50kHz	80kHz	105kHz	
Output Ripple and Noise <sup>(2)</sup>	20NMHz BW		50mVp-p	100mVp-p	

#### Efficiency vs. Load



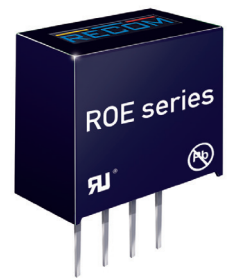
#### Notes:

Note2: Measurements are made with a 100nF MLCC across output. (low ESR)

**RECOM**  
DC/DC Converter

## ROE

1 Watt  
SIP4  
Single Output



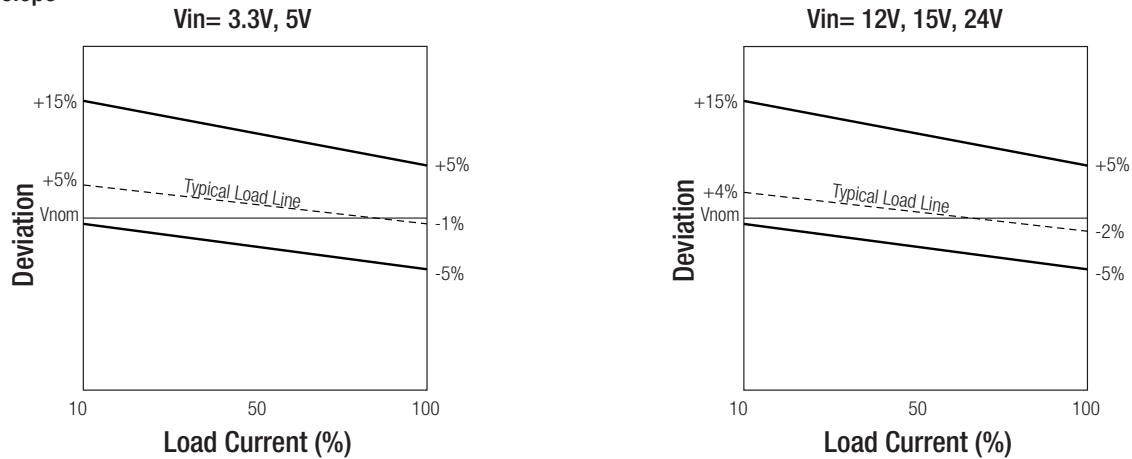
**UL** US  
E358085

UL60950-1 Certified

Specifications (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)

REGULATIONS		
Parameter	Condition	Values
Output Voltage Accuracy	100% load, $V_{in}$ nominal	$\pm 5\%$ max.
Line Voltage Regulation	low line to high line, full load	$\pm 1.2\%$ typ. / $1\% V_{in}$
Load Voltage Regulation	20% to 100% load, $5V_{out}$	15% max.
	20% to 100% load, $12V_{out}$ and $15V_{out}$	10% max.

**Tolerance Envelope**



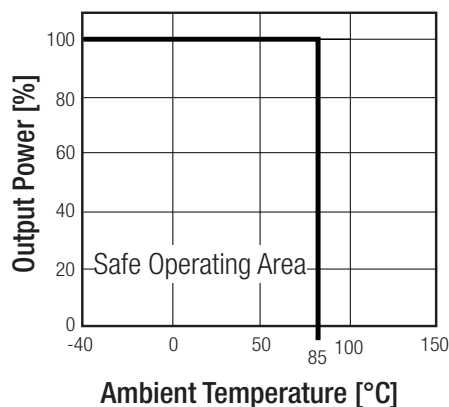
PROTECTIONS		
Parameter	Condition	Value
Isolation Voltage	I/P to O/P	1kVDC / 1 second
Isolation Capacitance		75pF max.
Isolation Resistance		1G $\Omega$ min.

ENVIRONMENTAL			
Parameter	Condition	Value	
Operating Temperature Range	free air convection (see graph)	$-40^\circ\text{C}$ to $+85^\circ\text{C}$	
Operating Humidity	non-condensing	95% RH max.	
Vibration		MIL-STD-202G	
MTBF <sup>(3)</sup>	according to MIL-HDBK-217F	$+25^\circ\text{C}$	$20140 \times 10^3$ hours
		$+85^\circ\text{C}$	$8674 \times 10^3$ hours

**Notes:**

Note3: MTBF is referring ROE-3.305S.

**Derating Graph**



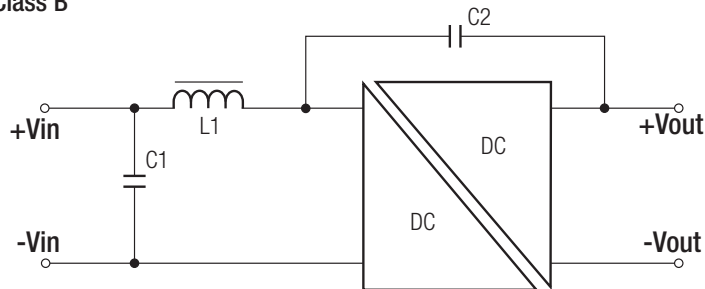
Specifications (measured at  $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)a

### SAFETY AND CERTIFICATIONS

Certificate Type	Report / File Number	Standard
UL General Safety	E358085-A4	UL-60950-1, 2nd Edition
CAN/CSA General Safety	E358085-A4	C22.2 No. 60950-1-07

EMI Compliance	Condition	Standard / Criterion
EMC Conducted and Radiated	only with external filter (see suggestions)	EN55022, Class A EN55022, Class B

### EMC Filtering - Suggestions for Class B



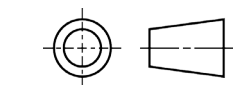
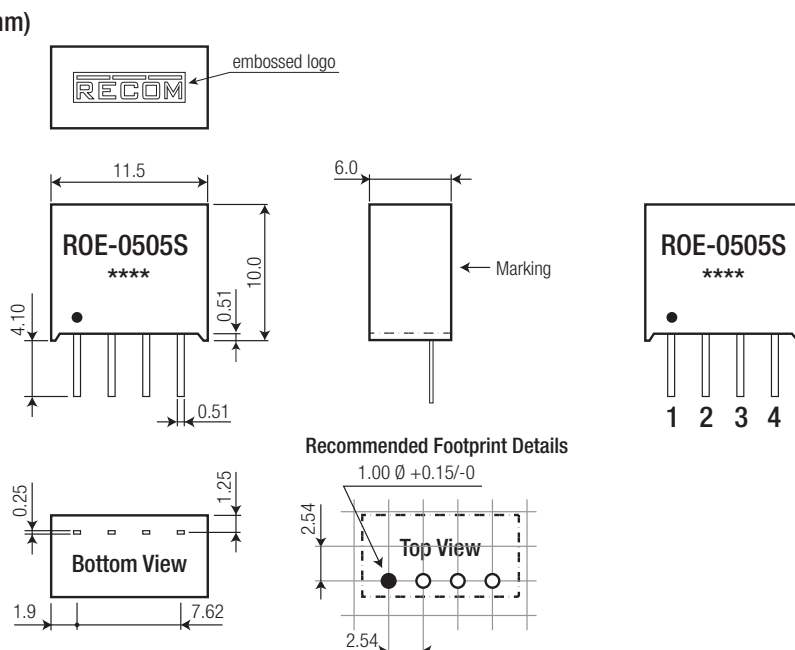
	Input Voltage	C1	L1	C2
EN55022 Class A	3.3	10 $\mu\text{F}$	1.2 $\mu\text{H}$	470pF/4kVDC
	5	10 $\mu\text{F}$	3.3 $\mu\text{H}$	470pF/4kVDC
	12	2.2 $\mu\text{F}$	10 $\mu\text{H}$	470pF/4kVDC
	15	2.2 $\mu\text{F}$	10 $\mu\text{H}$	470pF/4kVDC
	24	2.2 $\mu\text{F}$	22 $\mu\text{H}$	470pF/4kVDC

	Input Voltage	C1	L1	C2
EN55022 Class B	3.3	22 $\mu\text{F}$	3.3 $\mu\text{H}$	470pF/4kVDC
	5	10 $\mu\text{F}$	4.7 $\mu\text{H}$	470pF/4kVDC
	12	4.7 $\mu\text{F}$	22 $\mu\text{H}$	470pF/4kVDC
	15	4.7 $\mu\text{F}$	22 $\mu\text{H}$	470pF/4kVDC
	24	2.2 $\mu\text{F}$	47 $\mu\text{H}$	470pF/4kVDC

### DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Case Material		non-conductive black plastic (UL94V-0)
Potting Material		Epoxy (UL94V-0)
Package Dimension (LxWxH)		11.5 x 6.0 x 10.0mm
Package Weight		1.4g

### Dimension Drawing (mm)



### Pin Connections

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

Tolerance: xx.x=  $\pm 0.50\text{mm}$   
xx.xx= $\pm 0.25\text{mm}$

Specifications (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	Tube	520 x 16 x 9mm
Packaging Quantity		42 pcs
Storage Temperature Range		$-55^\circ\text{C}$ to $+125^\circ\text{C}$

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