

## 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 and CAN/CSA C22.2 No. 60950-1-07 certified

## ROE

**1 Watt**  
**SIP4**  
**Single Output**



### 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 | nom. 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



**UL**  
C **UL** US  
E358085

### Model Numbering



#### Ordering Examples:

ROE-0512S = 5VDC Input Voltage, 12VDC Output Voltage, Single Output  
ROE-2405S = 24VDC Input Voltage, 5VDC Output Voltage, Single Output

UL60950-1 certified  
CAN/CSA C22.2 No. 60950-1-07 certified  
EN60950-1 certified  
IEC60950-1 certified  
EN55032 compliant

**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , nom.  $V_{in}$ , full load and after warm-up unless otherwise stated)

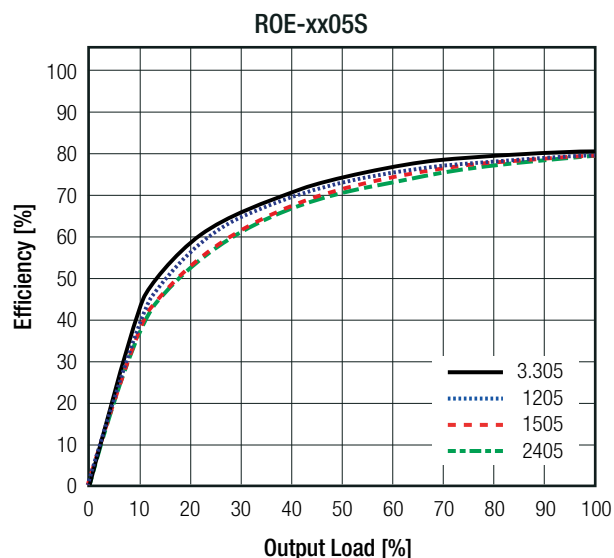
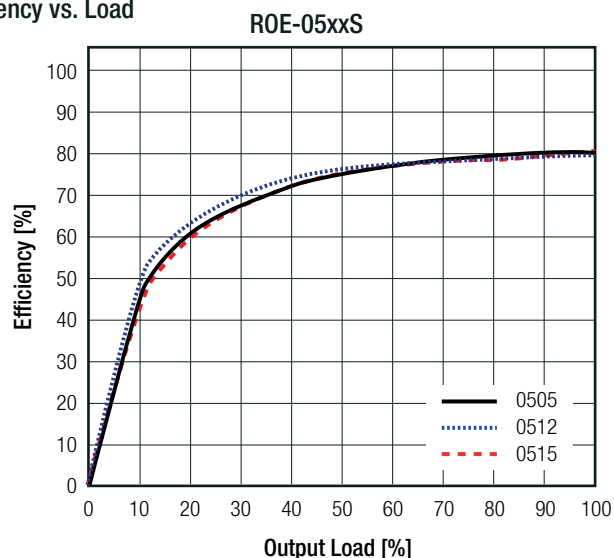
### BASIC CHARACTERISTICS

| Parameter                              | Condition | Min.  | Typ.       | Max.     |
|----------------------------------------|-----------|-------|------------|----------|
| Input Voltage Range                    |           |       | $\pm 10\%$ |          |
| Operating Frequency Range              |           | 50kHz | 80kHz      | 105kHz   |
| Output Ripple and Noise <sup>(2)</sup> | 20MHz BW  |       | 50mVp-p    | 100mVp-p |

#### Notes:

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

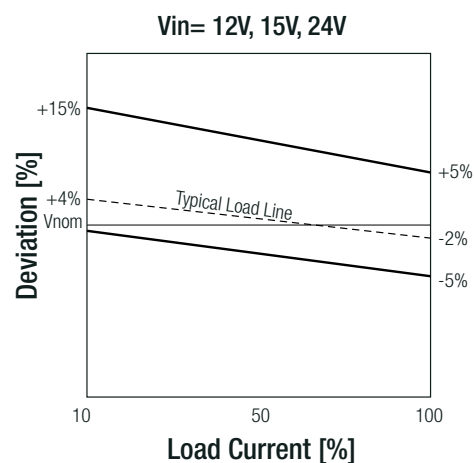
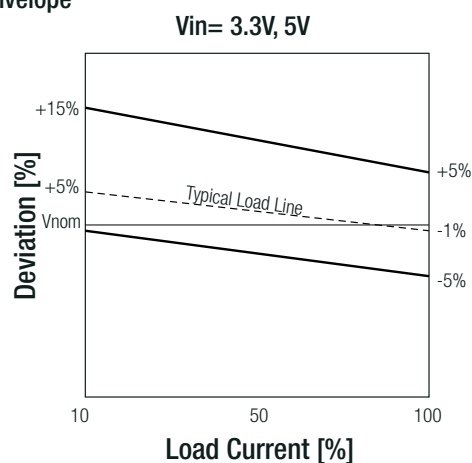
#### Efficiency vs. Load



### REGULATIONS

| Parameter       | Condition             |                   | Values                              |
|-----------------|-----------------------|-------------------|-------------------------------------|
| Output Accuracy |                       |                   | $\pm 5.0\%$ max.                    |
| Line Regulation | low line to high line |                   | $\pm 1.2\%$ typ. / $1.0\%$ $V_{in}$ |
| Load Regulation | 20% to 100% load      | 5Vout             | 15% max.                            |
|                 |                       | 12Vout and 15Vout | 10% max.                            |

#### Tolerance Envelope



**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

**PROTECTIONS**

| Parameter                        | Condition  |                     | Value     |
|----------------------------------|------------|---------------------|-----------|
| Isolation Voltage <sup>(3)</sup> | I/P to O/P | tested for 1 second | 1kVDC     |
| Isolation Capacitance            |            |                     | 75pF max. |
| Isolation Resistance             |            |                     | 1GΩ min.  |

**Notes:**

Note3: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note4: An input fuse is required if the mains supply is not over-current protected. Recommended fuse: T1A slow blow type

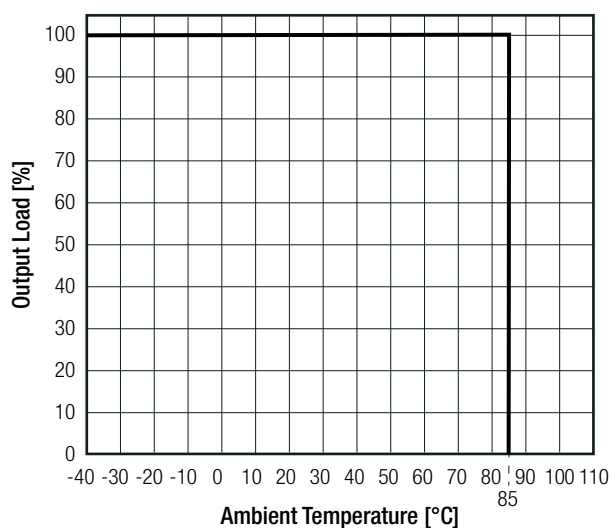
**ENVIRONMENTAL**

| Parameter                   | Condition                                         |                | Value                                                         |
|-----------------------------|---------------------------------------------------|----------------|---------------------------------------------------------------|
| Operating Temperature Range | without derating @free air convection (see graph) |                | -40°C to +85°C                                                |
| Operating Humidity          | non-condensing                                    |                | 95% RH max.                                                   |
| Vibration                   |                                                   |                | MIL-STD-202G                                                  |
| MTBF <sup>(5)</sup>         | according to MIL-HDBK-217F; G.B.                  | +25°C<br>+85°C | 20140 x 10 <sup>3</sup> hours<br>8674 x 10 <sup>3</sup> hours |

**Notes:**

Note5: MTBF is referring ROE-3.305S

**Derating Graph**



**SAFETY AND CERTIFICATIONS**

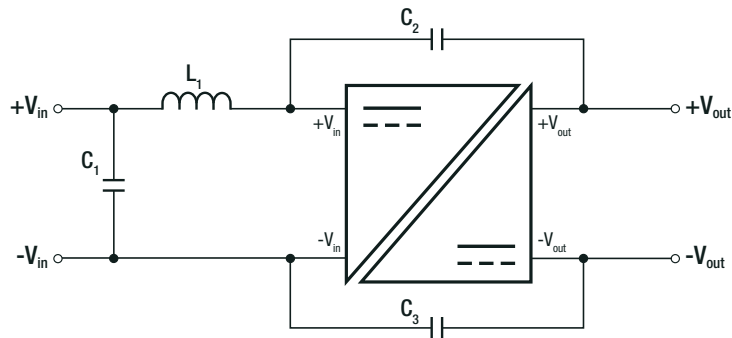
| Certificate Type                                                  | Report / File Number | Standard                                                                       |
|-------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------|
| Information Technology Equipment, General Requirements for Safety | E358085-A4-UL        | UL60950-1, 2nd Edition, 2007<br>CAN/CSA C22.2 No.60950-1-07, 2nd Edition, 2007 |
| Information Technology Equipment, General Requirements for Safety | SPCLVD1602031        | IEC60950-1:2005, 2nd Edition + A2:2013<br>EN60950-1:2006 + A2:2013             |
| EAC                                                               | RU-AT.49.09571       | TP TC 004/2011                                                                 |
| RoHS 2+                                                           |                      | RoHS-2011/65/EU + AM-2015/863                                                  |

| EMI Compliance                                                                | Condition                                             | Standard / Criterion                 |
|-------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------|
| Electromagnetic compatibility of multimedia equipment - Emission requirements | with external filter<br>(see filter suggestion below) | EN55032, Class B<br>EN55032, Class A |

continued on next page

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

**EMC Filter Suggestion according to EN55032**



**Component List Class A**

| MODEL     | C1          | L1  | C2 (safety) | C3 (safety) |
|-----------|-------------|-----|-------------|-------------|
| ROE-0505S | 6.8μF, MLCC | N/A | N/A         | N/A         |
| ROE-0515S | 4.7μF, MLCC |     | N/A         |             |
| ROE-1205S | 10μF        |     | 470pF       |             |
| ROE-2405S | 100V MLCC   |     | N/A         |             |

**Component List Class B**

| MODEL     | C1                | L1                    | C2 (safety) | C3 (safety) |
|-----------|-------------------|-----------------------|-------------|-------------|
| ROE-0505S | 10μF<br>100V MLCC | 22μH choke<br>RLS-226 | 330pF       | 330pF       |
| ROE-0515S |                   |                       |             |             |
| ROE-1205S |                   |                       |             |             |
| ROE-2405S |                   |                       |             |             |

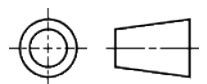
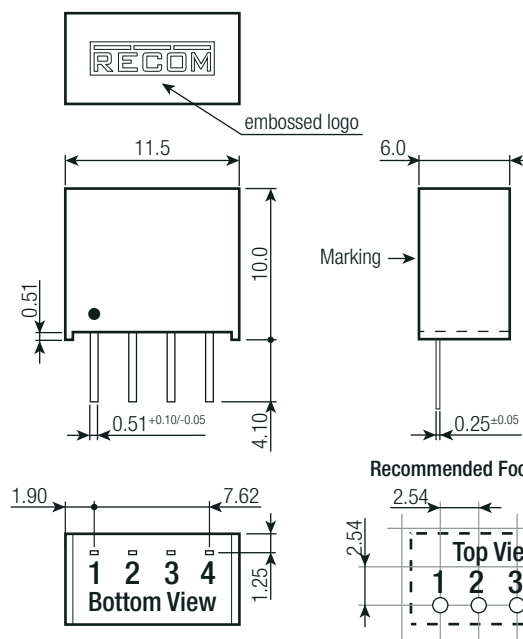
**Notes:**

Note6: 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<br>potting | non-conductive black plastic, (UL94 V-0)<br>epoxy, (UL94 V-0) |
| Dimension (LxWxH) |                 | 11.5 x 6.0 x 10.0mm                                           |
| Weight            |                 | 1.4g                                                          |

**Dimension Drawing (mm)**

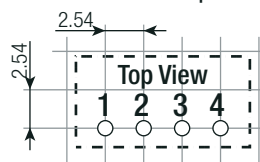


**Pin Connections**

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

Tolerance: xx.x= ±0.50mm  
xx.xx=±0.25mm

**Recommended Footprint Details**



**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

| PACKAGING INFORMATION       |      |                      |
|-----------------------------|------|----------------------|
| Parameter                   | Type | Value                |
| Packaging Dimension (LxWxH) | tube | 520.0 x 16.0 x 9.0mm |
| Packaging Quantity          |      | 42 pcs               |
| Storage Temperature Range   |      | -55°C to +125°C      |

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.