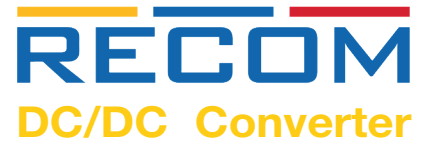


# Features

# Unregulated Converters

- SMD case style
- Tape and reel packaging
- UL60950-1 certified
- High operating temperature range from -40°C to +100°C at full load
- Efficiency up to 76%
- 2kVDC/1s isolation



## R1SE/H2

**1 Watt  
SMD  
Single Output**



### Description

The R1SE/H2 series are 1W unregulated DC/DC converters that are lower cost than equivalent converters. The benefits of high volume production and semi-automatic assembly allow for a lower selling price without sacrificing our high quality standards. They are UL certified for safety, offer reasonable efficiency and still meet the full industrial operating temperature range of -40° to +100°C. All converters are 100% tested in production and carry our 3-year warranty.

### Selection Guide

| Part Number     | Input Voltage [VDC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ. <sup>(1)</sup> [%] | max. Capacitive Load <sup>(2)</sup> [µF] |
|-----------------|---------------------|----------------------|---------------------|------------------------------------|--|
| R1SE-3.305/H2-R | 3.3                 | 5                    | 200                 | 75                                 | 1000                                     |
| R1SE-0505/H2-R  | 5                   | 5                    | 200                 | 75                                 | 1000                                     |
| R1SE-0512/H2-R  | 5                   | 12                   | 84                  | 76                                 | 330                                      |
| R1SE-0515/H2-R  | 5                   | 15                   | 66                  | 76                                 | 220                                      |
| R1SE-1205/H2-R  | 12                  | 5                    | 200                 | 73                                 | 1000                                     |
| R1SE-1505/H2-R  | 15                  | 5                    | 200                 | 74                                 | 1000                                     |

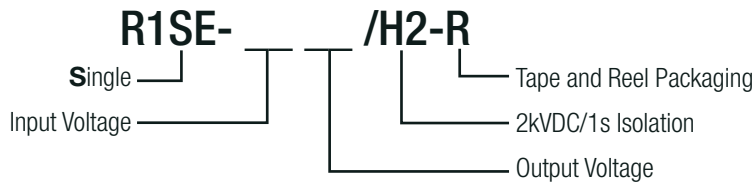


#### Notes:

- Note1: Efficiency is tested at nominal input and full load at +25°C ambient
- Note2: Max. capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter

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

### Model Numbering



#### Ordering Examples:

R1SE-0505/H2-R: Single Output, 5VDC Input, 5VDC Output, 2kVDC/1s isolation and tape and reel packaging

**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage and rated current unless otherwise specified)

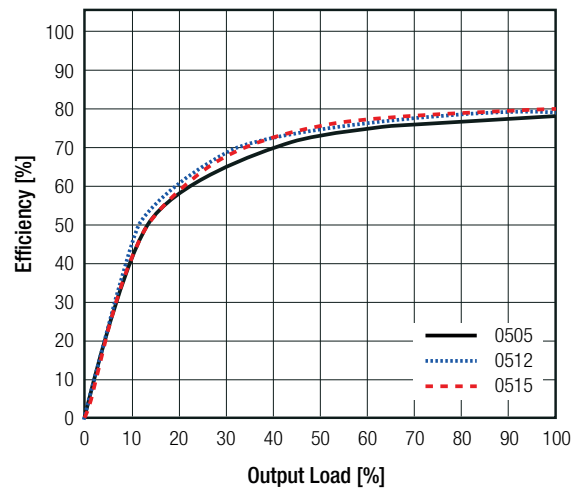
**BASIC CHARACTERISTICS**

| Parameter                              | Condition | Min.  | Typ.       | Max.     |
|--|-----------|-------|------------|----------|
| Input Voltage Range                    |           |       | $\pm 10\%$ |          |
| Internal Operating Frequency           |           | 20kHz | 60kHz      | 100kHz   |
| Output Ripple and Noise <sup>(3)</sup> | 20MHz BW  |       | 50mVp-p    | 100mVp-p |

**Notes:**

Note3: Measurements are made with a 100nF MLCC across output (low ESR)

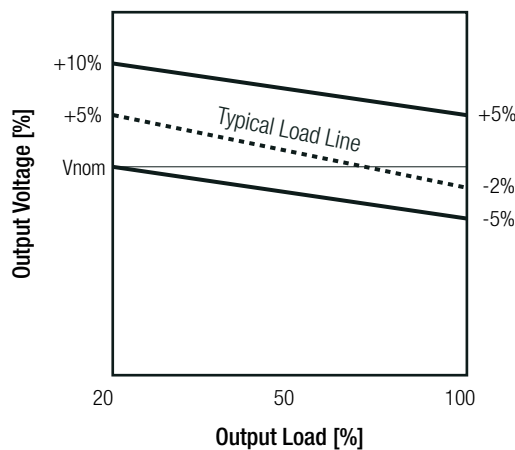
**Efficiency vs. Load**



**REGULATIONS**

| Parameter       | Condition                        | Value                               |
|-----------------|----------------------------------|-------------------------------------|
| Output Accuracy |                                  | -2.0% typ. / $\pm 5.0\%$ max.       |
| Line Regulation | low line to high line, full load | $\pm 1.0\%$ typ. / $\pm 1.5\%$ max. |
| Load Regulation | 20% to 100% load                 | 6.0% typ. / 10.0% max.              |

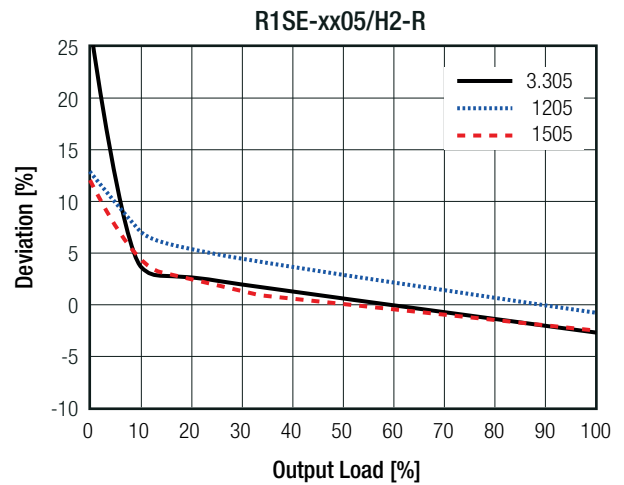
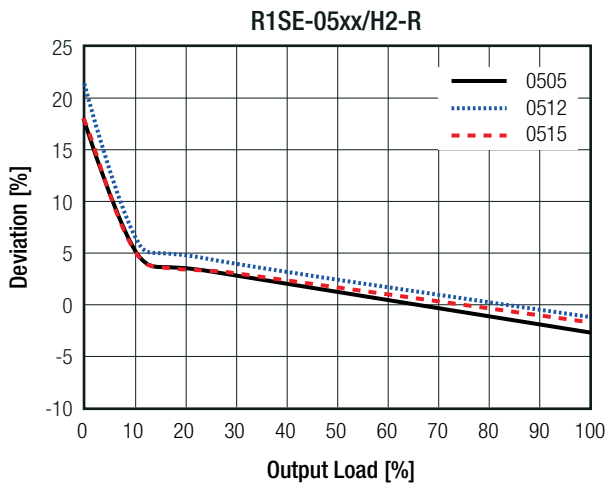
**Tolerance Envelope**



continued on next page

**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage and rated current unless otherwise specified)

### Deviation vs. Load



### PROTECTIONS

| Parameter             | Type        |                     | Value     |
|-----------------------|-------------|---------------------|-----------|
| Isolation Voltage     | I/P to O/P  | tested for 1 second | 2kVDC     |
| Isolation Resistance  | Viso = 500V |                     | 10GΩ min. |
| Isolation Capacitance |             |                     | 75pF max. |

#### Notes:

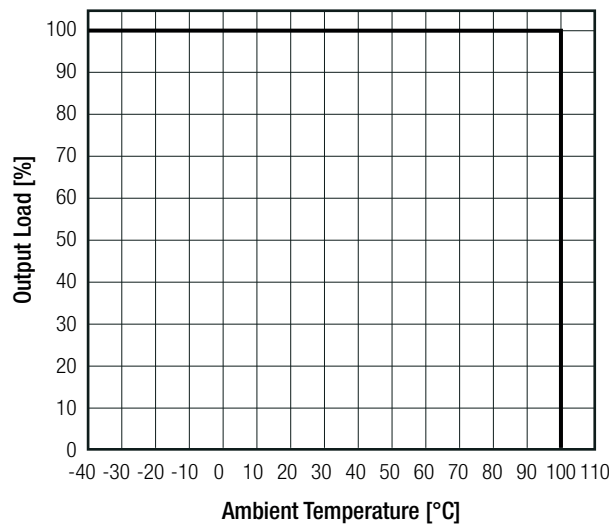
Note4: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

### ENVIRONMENTAL

| Parameter                   | Condition                        |                | Value   |
|-----------------------------|----------------------------------|----------------|---|
| Operating Temperature Range | full load @ free air convection  |                | -40°C to +100°C   |
| Operating Altitude          |                                  |                | 2000m   |
| Operating Humidity          | non-condensing                   |                | 95% RH max.   |
| Pollution Degree            |                                  |                | PD2   |
| MTBF                        | according to MIL-HDBK-217F, G.B. | +25°C<br>+85°C | 2992 x 10 <sup>3</sup> hours<br>955 x 10 <sup>3</sup> hours |

### Derating Graph

(@ free air convection)



**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage and rated current unless otherwise specified)

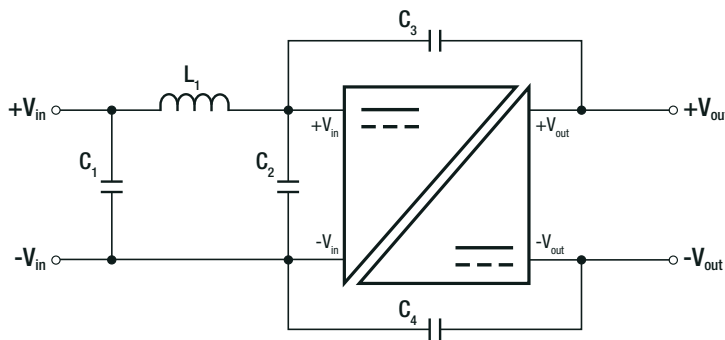
**SAFETY AND CERTIFICATIONS**

| Certificate Type (Safety)   | Report / File Number | Standard  |
|---|----------------------|---|
| Information Technology Equipment, General Requirements for Safety | E358085-A2-UL        | UL60950-1, 2nd Edition:2007<br>CAN/CSA C22.2 No. 60950-1-03, 2nd Edition:2007 |
| EAC   | RU-AT.49.09571       | TP TC 004/2011  |
| RoHS 2+   |                      | RoHS-2011/65/EU + AM-2015/863   |

**EMC Compliance**

| EMC Compliance  | Condition            | Standard / Criterion                 |
|---|----------------------|--------------------------------------|
| Electromagnetic compatibility of multimedia equipment - Emission requirements | with external filter | EN55032, Class B<br>EN55032, Class A |

**EMC Filter Suggestion according to EN55032**



**Component List Class A**

| MODEL        | C1  | L1  | C2                | C3 and C4 |
|--------------|-----|-----|-------------------|-----------|
| R1SE-0505/H2 | N/A | N/A | 6.8 $\mu\text{F}$ | N/A       |
| R1SE-0512/H2 |     |     | 50V MLCC          |           |
| R1SE-1205/H2 |     |     | 10 $\mu\text{F}$  |           |
| R1SE-1505/H2 |     |     | 100V MLCC         |           |

**Component List Class B**

| MODEL        | C1                            | L1                                | C3 (safety) | C4 (safety) |
|--------------|-------------------------------|-----------------------------------|-------------|-------------|
| R1SE-0505/H2 | 10 $\mu\text{F}$<br>100V MLCC | 12 $\mu\text{H}$ choke<br>RLS-126 | 330pF       | 330pF       |
| R1SE-0512/H2 |                               |                                   |             |             |
| R1SE-1205/H2 |                               |                                   |             |             |
| R1SE-1505/H2 |                               |                                   |             |             |

**Notes:**

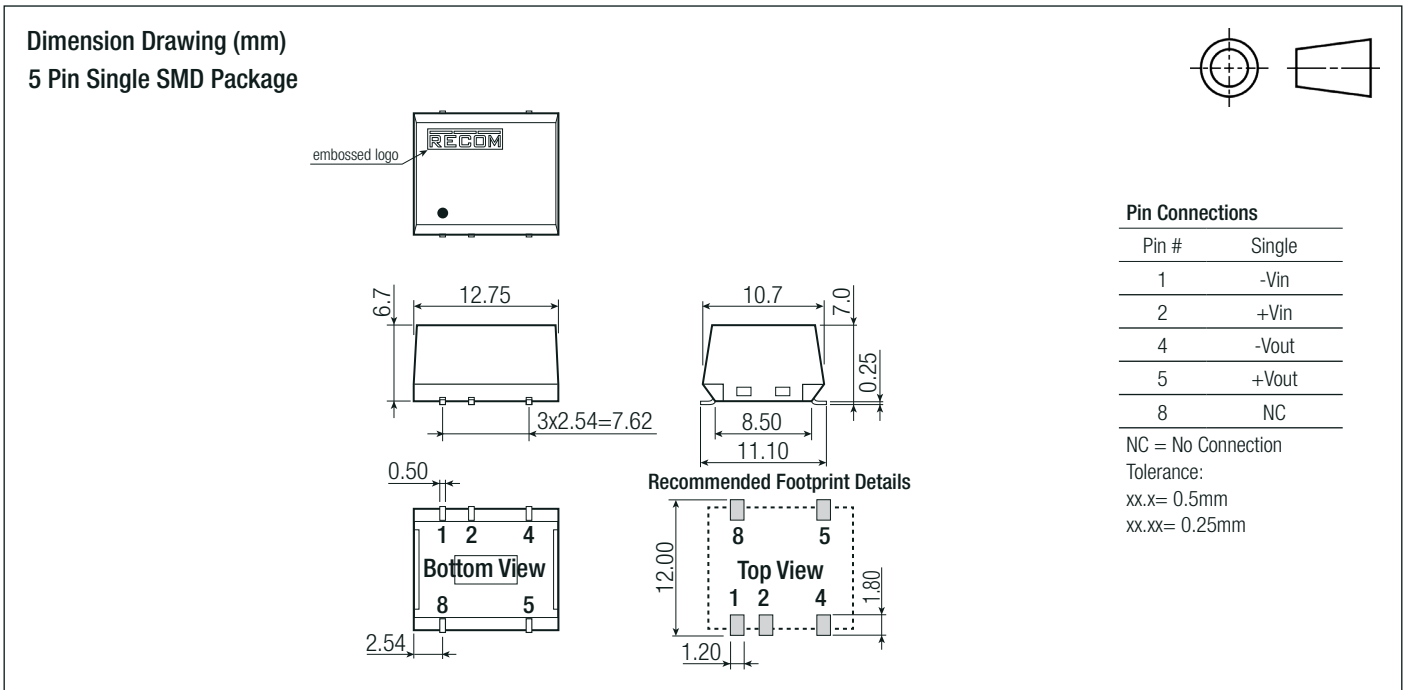
Note5: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact RECOM tech support for advice

**DIMENSION AND PHYSICAL CHARACTERISTICS**

| Parameter         | Type | Value                                   |
|-------------------|------|---|
| Material          | case | non-conductive black plastic (UL94 V-0) |
| Dimension (LxWxH) |      | 12.75 x 10.7 x 6.7mm                    |
| Weight            |      | 1.0g typ.                               |

continued on next page

**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage and rated current unless otherwise specified)



**PACKAGING INFORMATION**

|                             |                        |                        |
|-----------------------------|------------------------|------------------------|
| Packaging Dimension (LxWxH) | tape and reel (carton) | 355.0 x 342.0 x 36.0mm |
| Packaging Quantity          | tape and reel          | 500pcs                 |
| Tape Width                  |                        | 24.0mm                 |
| 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.