

## Features

### Unregulated Converters

- RoHS 5/6 Conform
- 1kVDC or 3kVDC Isolation Options
- H version Approved for Medical Applications
- Suitable for Fully Automated Assembly
- Optional Continuous Short Circuit Protected
- Efficiency to 84%
- RoHS 5/6 Conform

#### Selection Guide

| Part Number<br>SMD | (3kV) | Input Voltage<br>(VDC) | Output Voltage<br>(VDC) | Output Current<br>(mA) | Efficiency<br>(%) |
|--------------------|-------|------------------------|-------------------------|------------------------|-------------------|
| RSS**-xx3.3        | (H)   | 3.3, 5, 12, 15, 24     | 3.3                     | 303                    | 75                |
| RSS**-xx05         | (H)   | 3.3, 5, 12, 15, 24     | 5                       | 200                    | 70-78             |
| RSS**-xx09         | (H)   | 3.3, 5, 12, 15, 24     | 9                       | 111                    | 74-78             |
| RSS**-xx12         | (H)   | 3.3, 5, 12, 15, 24     | 12                      | 84                     | 76-80             |
| RSS**-xx15         | (H)   | 3.3, 5, 12, 15, 24     | 15                      | 66                     | 76-82             |
| RSS**-xx24         | (H)   | 3.3, 5, 12, 15, 24     | 24                      | 42                     | 74-84             |
| RSD**-xx3.3        | (H)   | 3.3, 5, 12, 15, 24     | ±3.3                    | ±152                   | 70                |
| RSD**-xx05         | (H)   | 3.3, 5, 12, 15, 24     | ±5                      | ±100                   | 72-78             |
| RSD**-xx09         | (H)   | 3.3, 5, 12, 15, 24     | ±9                      | ±56                    | 74-78             |
| RSD**-xx12         | (H)   | 3.3, 5, 12, 15, 24     | ±12                     | ±42                    | 76-80             |
| RSD**-xx15         | (H)   | 3.3, 5, 12, 15, 24     | ±15                     | ±33                    | 76-82             |
| RSD**-xx24         | (H)   | 3.3, 5, 12, 15, 24     | ±24                     | ±21                    | 74-84             |

xx = Input Voltage (other input and output voltage combinations available on request)

\* add Suffix "H" for 3kV Isolation, e.g. RSS-0505/H, RSD-0505/H, RSS12-0505/H, RSD12-0505/H

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RSS8-0505/P, RSS-0505/HP, RSD12-0505/HP

\* add suffix -R for tape & reel packing e.g. RSS-0505-R. For more details see Application Notes.

#### Case and Pinning Options (note restrictions on /H option)

- RSS\*\* : \*\* without marking denotes 5 pins out of 8 fitted (includes /H option)  
 \*\* with marking **8** denotes 8 pins out of 8 fitted (/H option not available)  
 \*\* with marking **12** denotes 10 pins out of 12 fitted (includes /H option)
- RSD\*\* : \*\* without marking denotes 6 pins out of 10 fitted (includes /H option)  
 \*\* with marking **10** denotes with 10 pins out of 10 fitted (/H option not available)  
 \*\* with marking **12** denotes 10 pins out of 12 fitted (includes /H option)

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

|                                         |                                                 |                          |
|-----------------------------------------|-------------------------------------------------|--------------------------|
| Input Voltage Range                     | ±10%                                            |                          |
| Output Voltage Accuracy                 | ±5% max.                                        |                          |
| Line Voltage Regulation                 | RSS, RSS8, RSD, RSD10                           | 1.2%/1% of $V_{in}$ typ. |
|                                         | RSS12, RSD12                                    | 1%/1% of $V_{in}$ typ.   |
| Load Voltage Regulation                 | 3.3V output types                               | 15% typ., 20% max.       |
| (10% to 100% full load)                 | 5V output type                                  | 12% typ., 15% max.       |
|                                         | 9V, 12V, 15V, 24V output types                  | 7% typ., 10% max.        |
| Output Ripple and Noise (20MHz limited) | All Variants                                    | 100mVp-p max.            |
| Operating Frequency                     | 50kHz min. / 100kHz typ. / 120kHz max.          |                          |
| Efficiency at Full Load                 | See Selection Guide                             |                          |
| Minimum Load = 0%                       | Specifications valid for 10% minimum load only. |                          |
| Isolation Voltage                       | (tested for 1 second)                           | 1000VDC min.             |
|                                         | H-Suffix (tested for 1 second)                  | 3000VDC min.             |
| Rated Working Voltage                   | (long term isolation)                           | see Application Notes    |
| Isolation Capacitance                   | RSS, RSS8, RSD, RSD10                           | 15pF min. / 70pF max.    |
|                                         | RSS12, RSD1                                     | 10pF min. / 75pF max.    |
| Isolation Resistance                    | 10 GΩ min.                                      |                          |

cont on next page

## ECONOLINE

DC/DC-Converter

RECOM

### 1 Watt SMD Single & Dual Output



**EN-60950-1 Certified**  
**EN-60601-1 Certified**  
 (suffix H)

## RSS\_RSD

## EOL Dec.2011

**END OF LIFE:** Please do not use for new design, replace with new SMD converter **R1S** (single output) and/or **R1D** (dual output).

#### Description

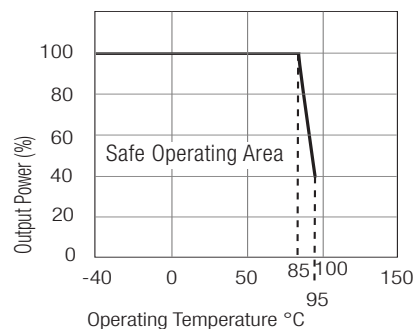
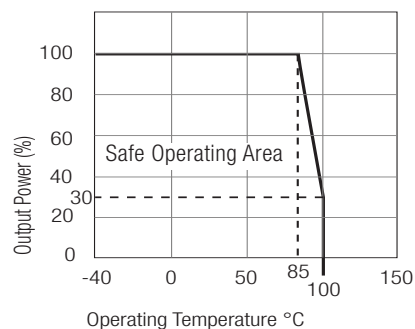
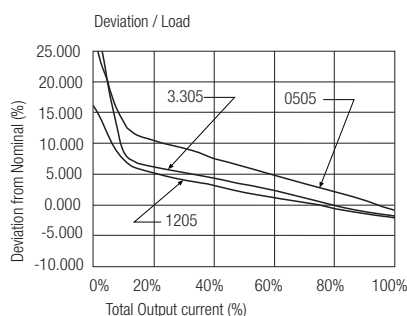
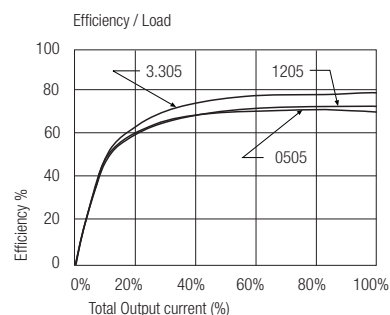
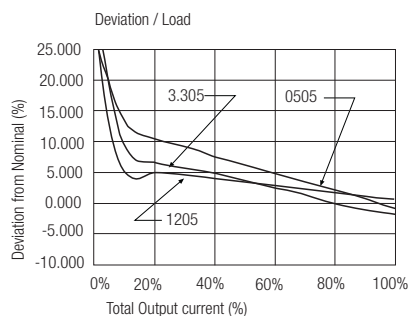
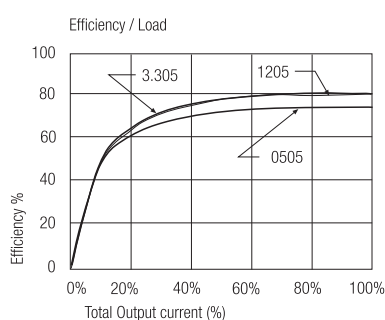
RSS and RSD DC/DC converters are typically used in general purpose low power isolation and voltage matching applications where an SMD mounting style is required. The converters feature a full industrial operating temperature range of  $-40^\circ\text{C} \sim +85^\circ\text{C}$  without derating and come in three different case formats to make them compatible with industry standards.

**Refer to Application Notes**

[www.recom-electronic.com](http://www.recom-electronic.com)

**ECONOLINE****DC/DC-Converter****Specifications - continued**

|                                                   |                                                                |                            |                              |
|---------------------------------------------------|----------------------------------------------------------------|----------------------------|------------------------------|
| Short Circuit Protection                          |                                                                | 1 Second                   |                              |
| P-Suffix                                          |                                                                | Continuous                 |                              |
| Operating Temperature Range (free air convection) |                                                                | -40°C to +85°C (see Graph) |                              |
| Storage Temperature Range                         |                                                                | -55°C to +125°C            |                              |
| Reflow Temperature                                | ROHS compliant                                                 | 245°C (30 sec) max.        |                              |
| Vapour Phase Process                              | (for more details see Application Notes)                       | 230°C (90 sec) max.        |                              |
| Relative Humidity                                 |                                                                | 95% RH                     |                              |
| Package weight                                    |                                                                | 1.9g (RSS), 2.2g (RSD)     |                              |
| Packing Quantity                                  | RSS, RSS8                                                      | 40 pcs per Tube            |                              |
|                                                   | RSS12, RSD                                                     | 33 pcs per tube            |                              |
|                                                   | All Types                                                      | 500 pcs per Reel           |                              |
| MTBF (+25°C)<br>(+85°C)                           | } Detailed Information see<br>Application Notes chapter "MTBF" | using MIL-HDBK 217F        | 1045 x 10 <sup>3</sup> hours |
|                                                   |                                                                | using MIL-HDBK 217F        | 183 x 10 <sup>3</sup> hours  |

**Tolerance Envelope****Derating-Graphs**  
(Ambient Temperature)**RSS, RSS8, RSD, RSD10****RSS12, RSD12****Typical Characteristics****RSS\*\*-xx05****RSS12-xx05**

# ECONOLINE

## DC/DC-Converter

### Typical Characteristics

# RSS\_RSD

## Series

### RSS\*\*-xx09



### RSS12-xx09



### RSS\*\*-xx12



### RSS12-xx12



### RSS\*\*-xx15



### RSS12-xx15



# ECONOLINE

## DC/DC-Converter

Package Style and Pinning (mm)

# RSS\_RSD

## Series

### RSD\*\*-xx05



### RSD12-xx05



### RSD\*\*-xx12



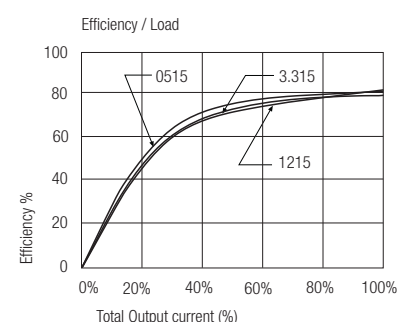
### RSD12-xx12



### RSD\*\*-xx15



### RSD12-xx15

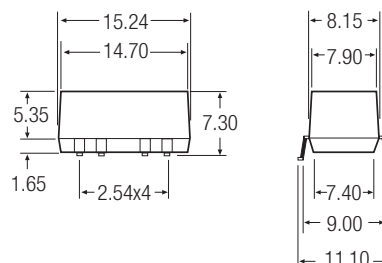
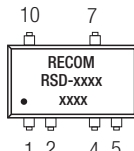
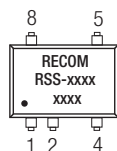
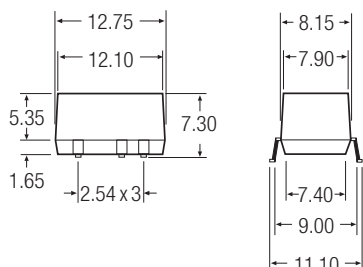


Package Style and Pinning (mm)

5 PIN Single SMD Package

Note: /H option is available in these pin packages

6 PIN Dual SMD Package



Recommended Footprint Details



Pin Connections

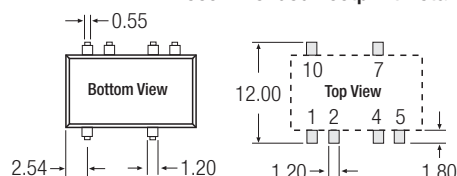
| Pin # | Single | Dual   |
|-------|--------|--------|
| 1     | -Vin   | -Vin   |
| 2     | +Vin   | +Vin   |
| 4     | -Vout  | Com    |
| 5     | +Vout  | -Vout  |
| 7     | No Pin | +Vout  |
| 8     | NC     | No Pin |
| 10    | No Pin | NC     |

NC = No Connection

XX.X ± 0.5 mm

XX.XX ± 0.25 mm

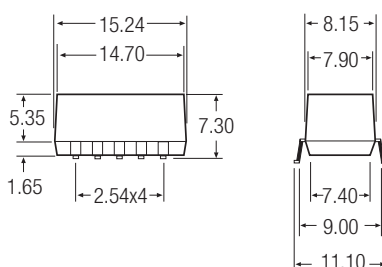
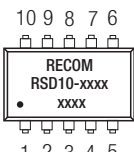
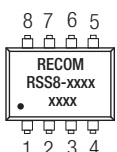
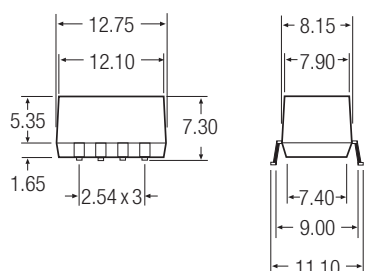
Recommended Footprint Details



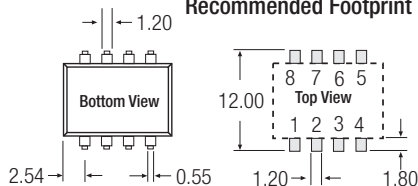
8 PIN Single SMD Package

Note: /H option is not available in these pin packages

10 PIN Dual SMD Package



Recommended Footprint Details



Pin Connections

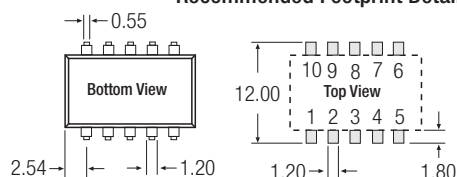
| Pin # | Single | Dual  |
|-------|--------|-------|
| 1     | -Vin   | -Vin  |
| 2     | +Vin   | +Vin  |
| 3     | NC     | NC    |
| 4     | -Vout  | Com   |
| 5     | +Vout  | -Vout |
| 6     | NC     | NC    |
| 7     | NC     | +Vout |
| 8     | NC     | NC    |
| 9     | -      | NC    |
| 10    | -      | NC    |

NC = No Connection

XX.X ± 0.5 mm

XX.XX ± 0.25 mm

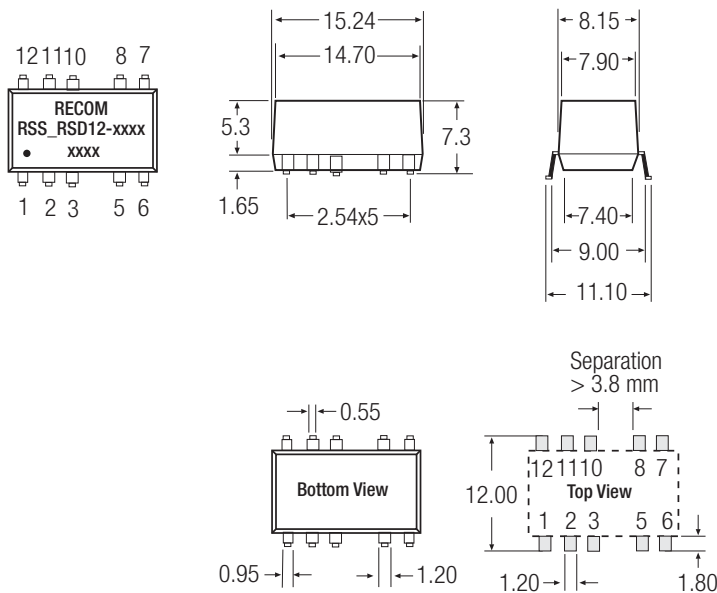
Recommended Footprint Details



Package Style and Pinning (mm)

12 PIN Single and Dual SMD Package

Note: /H option is available in this pin package



| Pin Connections |        |       |
|-----------------|--------|-------|
| Pin #           | Single | Dual  |
| 1               | -Vin   | -Vin  |
| 2               | +Vin   | +Vin  |
| 3               | NC     | NC    |
| 5               | -Vout  | Com   |
| 6               | NC     | -Vout |
| 7               | NC     | NC    |
| 8               | +Vout  | +Vout |
| 10              | NC     | NC    |
| 11              | NC     | NC    |
| 12              | NC     | NC    |

NC = No Connection

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

Recommended Footprint Details

Part Number Information

- RSS\*\* : \*\* without marking denotes 5 pins out of 8 fitted (includes /H option)

\*\* with marking **8** denotes 8 pins out of 8 fitted (/H option not available)

\*\* with marking **12** denotes 10 pins out of 12 fitted (includes /H option)

e.g. RSS-0505, RSS-0505/H, RSS-0505/HP

e.g. RSS8-0505, RSS8-0505/P

e.g. RSS12-0505, RSS12-0505/H, RSS12-0505/HP
- RSD\*\* : \*\* without marking denotes 6 pins out of 10 fitted (includes /H option)

\*\* with marking **10** denotes with 10 pins out of 10 fitted (/H option not available)

\*\* with marking **12** denotes 10 pins out of 12 fitted (includes /H option)

e.g. RSD-0505, RSD-0505/H, RSD-0505/HP

e.g. RSD10-0505, RSD10-0505/P

e.g. RSD12-0505, RSD12-0505/H, RSD12-0505/HP

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## RECOM:

[RSD-0505](#) [RSD-0505/H](#) [RSD-0505/HP](#) [RSD-0505/HP-R](#) [RSD-0505/H-R](#) [RSD-0505/P](#) [RSD-0505/P-R](#) [RSD-0505-R](#) [RSD-0509](#) [RSD-0509/H](#) [RSD-0509/HP](#) [RSD-0509/HP-R](#) [RSD-0509/H-R](#) [RSD-0509/P](#) [RSD-0509/P-R](#) [RSD-0509-R](#) [RSD-0512](#) [RSD-0512/H](#) [RSD-0512/HP](#) [RSD-0512/HP-R](#) [RSD-0512/H-R](#) [RSD-0512/P](#) [RSD-0512/P-R](#) [RSD-0512-R](#) [RSD-0515](#) [RSD-0515/H](#) [RSD-0515/HP](#) [RSD-0515/HP-R](#) [RSD-0515/H-R](#) [RSD-0515/P](#) [RSD-0515/P-R](#) [RSD-0515-R](#) [RSD-0524](#) [RSD-0524/H](#) [RSD-0524/HP](#) [RSD-0524/HP-R](#) [RSD-0524/H-R](#) [RSD-0524/P](#) [RSD-0524/P-R](#) [RSD-0524-R](#) [RSD-053.3](#) [RSD-053.3/H](#) [RSD-053.3/HP](#) [RSD-053.3/HP-R](#) [RSD-053.3/H-R](#) [RSD-053.3/P](#) [RSD-053.3/P-R](#) [RSD-053.3-R](#) [RSD10-0505](#) [RSD10-0505/P](#) [RSD10-0505/P-R](#) [RSD10-0505-R](#) [RSD10-0509](#) [RSD10-0509/P](#) [RSD10-0509/P-R](#) [RSD10-0509-R](#) [RSD10-0512](#) [RSD10-0512/P](#) [RSD10-0512/P-R](#) [RSD10-0512-R](#) [RSD10-0515](#) [RSD10-0515/P](#) [RSD10-0515/P-R](#) [RSD10-0515-R](#) [RSD10-0524](#) [RSD10-0524/P](#) [RSD10-0524/P-R](#) [RSD10-0524-R](#) [RSD10-053.3](#) [RSD10-053.3/P](#) [RSD10-053.3/P-R](#) [RSD10-053.3-R](#) [RSD10-1205](#) [RSD10-1205/P](#) [RSD10-1205/P-R](#) [RSD10-1205-R](#) [RSD10-1209](#) [RSD10-1209/P](#) [RSD10-1209/P-R](#) [RSD10-1209-R](#) [RSD10-1212](#) [RSD10-1212/P](#) [RSD10-1212/P-R](#) [RSD10-1212-R](#) [RSD10-1215](#) [RSD10-1215/P](#) [RSD10-1215/P-R](#) [RSD10-1215-R](#) [RSD10-1224](#) [RSD10-1224/P](#) [RSD10-1224/P-R](#) [RSD10-1224-R](#) [RSD10-123.3](#) [RSD10-123.3/P](#) [RSD10-123.3/P-R](#) [RSD10-123.3-R](#) [RSD10-1505](#) [RSD10-1505/P](#) [RSD10-1505/P-R](#) [RSD10-1505-R](#)