# Features

## Regulated Converters

- 2:1 Wide Range Voltage Input
- 1kVDC, 2kVD & 3kVDC Isolation
- UL94V-0 Package Material
- Continuous Short Circuit Protection with Current Foldback
- Low Noise
- No External Capacitor needed
- Efficiency to 83%

**ECONOLINE**
DC/DC-Converter

# RS Series

## 2 Watt SIP8 Isolated Single & Dual Output


**EN-60950-1 Certified**

**EN-60601-1 Certified (Suffix H2/H3 )**

RECOM

## Selection Guide 5V, 12V, 24V and 48V Input Types

| Part Number | Input Voltage Range | Rated Output Voltageat | Output Current Full Load | Efficiency typ. | Capacitive Load max. |
|---|---|---|---|---|---|
| SIP8 | (VDC) | (VDC) | (mA) | (%) | µF |
| RS-053.3S (H2/H3) | 4.5 - 9 | 3.3 | 500 | 68 | 1000 |
| RS-0505S (H2/H3) | 4.5 - 9 | 5 | 400 | 73 | 1000 |
| RS-0509S (H2/H3) | 4.5 - 9 | 9 | 222 | 74 | 470 |
| RS-0512S (H2/H3) | 4.5 - 9 | 12 | 166 | 75 | 220 |
| RS-0515S (H2/H3) | 4.5 - 9 | 15 | 134 | 75 | 100 |
| RS-123.3S (H2/H3) | 9 - 18 | 3.3 | 500 | 69 | 1000 |
| RS-1205S (H2/H3) | 9 - 18 | 5 | 400 | 75 | 1000 |
| RS-1209S (H2/H3) | 9 - 18 | 9 | 222 | 78 | 470 |
| RS-1212S (H2/H3) | 9 - 18 | 12 | 166 | 80 | 220 |
| RS-1215S (H2/H3) | 9 - 18 | 15 | 134 | 80 | 100 |
| RS-243.3S (H2/H3) | 18 - 36 | 3.3 | 500 | 70 | 1000 |
| RS-2405S (H2/H3) | 18 - 36 | 5 | 400 | 78 | 1000 |
| RS-2409S (H2/H3) | 18 - 36 | 9 | 222 | 81 | 470 |
| RS-2412S (H2/H3) | 18 - 36 | 12 | 166 | 83 | 220 |
| RS-2415S (H2/H3) | 18 - 36 | 15 | 134 | 83 | 100 |
| RS-483.3S (H2/H3) | 36 - 72 | 3.3 | 500 | 73 | 1000 |
| RS-4805S (H2/H3) | 36 - 72 | 5 | 400 | 78 | 1000 |
| RS-4809S (H2/H3) | 36 - 72 | 9 | 222 | 81 | 470 |
| RS-4812S (H2/H3) | 36 - 72 | 12 | 166 | 83 | 220 |
| RS-4815S (H2/H3) | 36 - 72 | 15 | 134 | 83 | 100 |
| RS-053.3D (H2/H3) | 4.5 - 9 | ±3.3 | ±250 | 68 | ±470 |
| RS-0505D (H2/H3) | 4.5 - 9 | ±5 | ±200 | 73 | ±470 |
| RS-0509D (H2/H3) | 4.5 - 9 | ±9 | ±111 | 74 | ±220 |
| RS-0512D (H2/H3) | 4.5 - 9 | ±12 | ±83 | 75 | ±100 |
| RS-0515D (H2/H3) | 4.5 - 9 | ±15 | ±67 | 75 | ±47 |
| RS-123.3D (H2/H3) | 9 - 18 | ±3.3 | ±250 | 69 | ±470 |
| RS-1205D (H2/H3) | 9 - 18 | ±5 | ±200 | 75 | ±470 |
| RS-1209D (H2/H3) | 9 - 18 | ±9 | ±111 | 78 | ±220 |
| RS-1212D (H2/H3) | 9 - 18 | ±12 | ±83 | 80 | ±100 |
| RS-1215D (H2/H3) | 9 - 18 | ±15 | ±67 | 80 | ±47 |
| RS-243.3D (H2/H3) | 18 - 36 | ±3.3 | ±250 | 70 | ±470 |
| RS-2405D (H2/H3) | 18 - 36 | ±5 | ±200 | 78 | ±470 |
| RS-2409D (H2/H3) | 18 - 36 | ±9 | ±111 | 81 | ±220 |
| RS-2412D (H2/H3) | 18 - 36 | ±12 | ±83 | 83 | ±100 |
| RS-2415D (H2/H3) | 18 - 36 | ±15 | ±67 | 83 | ±47 |
| RS-483.3D (H2/H3) | 36 - 72 | ±3.3 | ±250 | 73 | ±470 |
| RS-4805D (H2/H3) | 36 - 72 | ±5 | ±200 | 78 | ±470 |
| RS-4809D (H2/H3) | 36 - 72 | ±9 | ±111 | 81 | ±220 |
| RS-4812D (H2/H3) | 36 - 72 | ±12 | ±83 | 83 | ±100 |
| RS-4815D (H2/H3) | 36 - 72 | ±15 | ±67 | 83 | ±47 |

# ECONOLINE
DC/DC-Converter

# RS Series

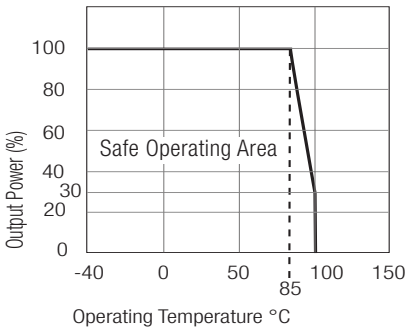
## Description

High power-density, an industrial temperature range of -40°C to +85°C and extra features like Remote-On-Off-control are just some of the characteristics of this converter, ideal for highly sophisticated industrial designs. The RS series is available with isolation of 2kV or 3kV by chosing option "/H2" or "/H3" in which case it is also ideal for medical applications which additionally require EN-60601-1 certification.

## Electrical Specifications (measured at $T_A$ = 25°C, at nominal input voltage and rated output current unless otherwise specified)

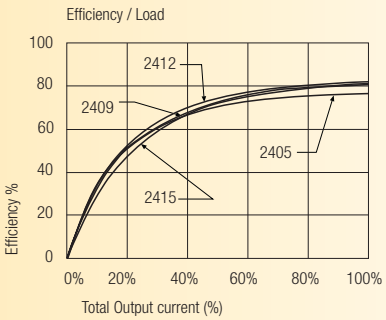
| | | |
|---|---|---|
| Input Voltage Range | | 2:1 |
| Output Accuracy | Single output | ±1% |
| | Dual output | ±2% |
| Line Voltage Regulation | Single output | ±0.2% max. |
| | Dual output | ±0.5% max. |
| Load Voltage Regulation (25% to 100% full load) | Single & Dual output | ±0.5% typ. |
| Output Ripple and Noise (20MHz limited) | | 50mVp-p max. |
| Switching Frequency (at full Load) | Single output | 85kHz min. |
| | Dual output | 100kHz min. / 700kHz max. |
| Efficiency at Full Load | | 70% min. / 80% typ. |
| No Load Power Consumption | | 50mW min. / 139mW typ. / 250mW max. |
| Isolation Voltage | (tested for 1 second) | 1000VDC min. |
| | H2 | 2000VDC min. |
| | H3 | 3000VDC min. |
| Rated Working Voltage | (long term isolation) | see Application Notes |
| Isolation Capacitance (1000V version) | Single | 10pF min. / 40pF typ. / 60pF max. |
| Isolation Capacitance (H2 and H3) | Single | 5pF min. / 30pF typ. / 60pF max. |
| Isolation Capacitance (1000V version) | Dual | 120pF min. / 170pF typ. / 250pF max. |
| Isolation Capacitance (H2 and H3) | Dual | 5pF min. / 30pF typ. / 60pF max. |
| Isolation Resistance | | 1GΩ min. |
| Short Circuit Protection | | Continuous |
| Operating Temperature Range | | –40°C to +85°C |
| Storage Temperature Range | | –55°C to +125°C |
| Relative Humidity | | 95% RH |
| Package Weight | | 4.8g |
| MTBF (+25°C) } *Detailed Information see* | using MIL-HDBK 217F | 1398 x $10^3$ hours |
| (+85°C) } *Application Notes chapter "MTBF"* | using MIL-HDBK 217F | 210 x $10^3$ hours |

## Derating-Graph
(Ambient Temperature)

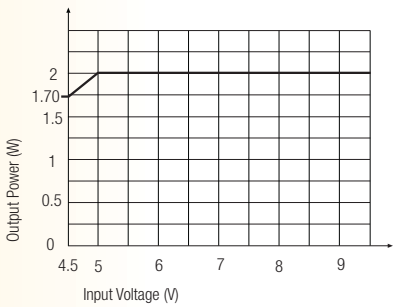



## Typical Characteristics

### RS-24xx




### RS-types



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DC/DC-Converter

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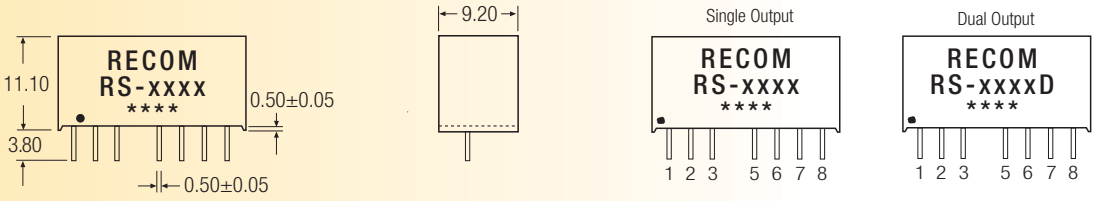
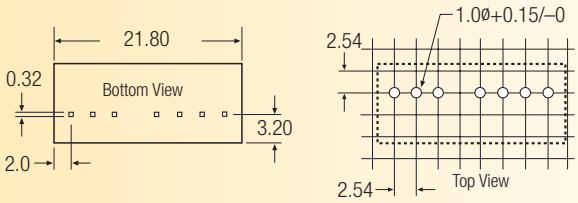
## Package Style and Pinning (mm)

3rd angle projection

**8 PIN SIP Package**




### Recommended Footprint Details




### Pin Connections

| Pin # | Single | Dual |
|---|---|---|
| 1 | –Vin | –Vin |
| 2 | +Vin | +Vin |
| 3 | CTRL | CTRL |
| 5 | NC | NC |
| 6 | +Vout | +Vout |
| 7 | –Vout | Com |
| 8 | NC* | –Vout |

NC = No Connection

NC* = NC, but no external Connection allowed.
XX.X ± 0.5 mm
XX.XX ± 0.25 mm

| | |
|---|---|
| Control Pin Input Current: | 10mA |
| Voltage Set Point Accuracy with external input/output capacitors refer to recommended test circuit: | typ. ± 1%<br>max. ±2% |
| Control Pin (CTRL) Input Current, control voltage applied via 1K resistor, output voltage must reduce to 0V: | typ. 3mA<br>max. 6mA |

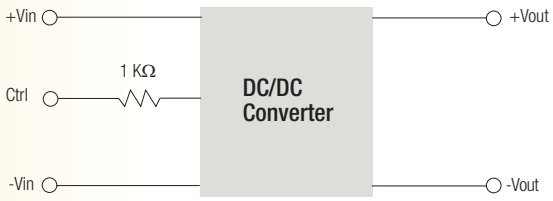
**Pin 3 (CTRL)**
This pin provides an Off function which puts the converter into a low power mode. When the pin is 'high' the converter is OFF and when the pin is high 'Z' the converter is ON. There is no allowed low state for this pin. Voltage to be applied via a limiting resistor with a recommended value of 1K for RS-05xx; 3.3K for RS-12xx; RS-24xx and 10K for RS-48xx).

**Pin 5 (NC)**
This pin is used internally and must have no external connection.

**Pin 8 (NC*)**
No external connection allowed.

## Application circuit

Remote ON/OFF
ON: open or high impedance.
OFF: 3---6mA input current applied Via 1KΩ resistor
(OFF stand by current 10mA max.)




| | | |
|---|---|---|
| $L_{in}$ | RS- types | 4.7µH ~ 100µH |
| $C_{out}$ | RS- types | 22µF ~ 100µF/25V |