

Features

Regulated Converters

- 2:1 and 4:1 Wide Input Voltage Ranges
- 1kVDC, 2kVD or 3kVDC Isolation
- UL94V-0 Package Material
- Certified for Medical Applications
- Continuous Short Circuit Protection
- Low Noise
- No External Capacitor needed
- Efficiency to 83 %

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 RSO series is available with isolation of 2kV or 3kV by choosing option "/H2" or "/H3" in which case it is also ideal for medical applications which additionally require EN-60601-1 certification. The "Z" version features 4:1 input voltage range, while the standard version offers 2:1 input voltage range and includes a low voltage input range down to 4.5V.

Selection Guide

| Part Number | Input Voltage Range (VDC) | Rated Output Voltage (VDC) | Output Current (mA) | Efficiency typ. (%) | Max Capacitive Load ⁽¹⁾ |
|---------------------|-----------------------------|-----------------------------|---------------------|---------------------|------------------------------------|
| SIP8 | | | | | |
| | RSO-xx3.3S (H2/H3) | 4.5-9, 9-18 18-36, 36-72 | 3.3 | 300 | 68-72 70 |
| RSO-xx05S (H2/H3) | 4.5-9, 9-18 18-36, 36-72 | 5 | 200 | 73-75 75-78 | 1200µF |
| | RSO-xx09S (H2/H3) | 4.5-9, 9-18 18-36, 36-72 | 9 | 111 | 74-78 78-81 |
| RSO-xx12S (H2/H3) | 4.5-9, 9-18 18-36, 36-72 | 12 | 83 | 75-80 80-83 | 680µF |
| | RSO-xx15S (H2/H3) | 4.5-9, 9-18 18-36, 36-72 | 15 | 67 | 75-80 80-83 |
| RSO-xx3.3D (H2/H3) | | 4.5-9, 9-18 18-36, 36-72 | ±3.3 | ±150 | 68-72 70 |
| | RSO-xx05D (H2/H3) | 4.5-9, 9-18 18-36, 36-72 | ±5 | ±100 | 73-75 75-76 |
| RSO-xx09D (H2/H3) | | 4.5-9, 9-18 18-36, 36-72 | ±9 | ±56 | 74-78 78 |
| | RSO-xx12D (H2/H3) | 4.5-9, 9-18 18-36, 36-72 | ±12 | ±42 | 75-79 79-80 |
| RSO-xx15D (H2/H3) | | 4.5-9, 9-18 18-36, 36-72 | ±15 | ±34 | 75-79 79-80 |
| | RSO-xx3.3SZ (H2/H3) | 9-36 18-72 | 3.3 | 300 | 70 70 |
| RSO-xx05SZ (H2/H3) | | 9-36 18-72 | 5 | 200 | 78 75 |
| | RSO-xx09SZ (H2/H3) | 9-36 18-72 | 9 | 111 | 81 78 |
| RSO-xx12SZ (H2/H3) | | 9-36 18-72 | 12 | 83 | 83 80 |
| | RSO-xx15SZ (H2/H3) | 9-36 18-72 | 15 | 67 | 83 80 |
| RSO-xx3.3DZ (H2/H3) | | 9-36 18-72 | ±3.3 | ±150 | 74 70 |
| | RSO-xx05DZ (H2/H3) | 9-36 18-72 | ±5 | ±100 | 77 75 |
| RSO-xx09DZ (H2/H3) | | 9-36 18-72 | ±9 | ±56 | 78 78 |
| | RSO-xx12DZ (H2/H3) | 9-36 18-72 | ±12 | ±42 | 80 80 |
| RSO-xx15DZ (H2/H3) | | 9-36 18-72 | ±15 | ±34 | 80 80 |

No suffix is standard isolation (1kVDC) e.g, RSO-0505S

*add suffix /H2 or /H3 for 2kVDC or 3kVDC isolation, e.g, RSO-0505S/H2, RSO-0505DZ/H3

ECONOLINE

DC/DC-Converter

with 3 year Warranty



1 Watt SIP8 Isolated Single & Dual Output



EN-60950-1 Certified
EN-60601-1 Certified
(Suffix H3)



2:1 Input
(RSO-S/D)
xx = 4.5-9Vin = 05
xx = 9-18Vin = 12
xx = 18-36Vin = 24
xx = 36-72Vin = 48

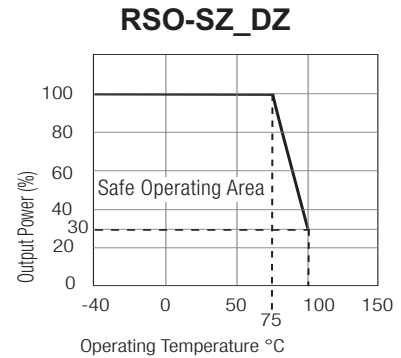
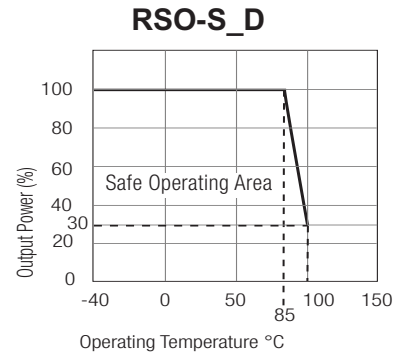
4:1 Input
(RSO-SZ/DZ)
xx = 9-36Vin = 24
xx = 18-72Vin = 48

Refer to Application Notes

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

| | | | |
|---|--|---------------------------|--|
| Input Voltage Range | | | 2:1 and 4:1 |
| Output Voltage Accuracy | | | $\pm 2\%$ typ. |
| Line Voltage Regulation | 2:1 | | $\pm 0.2\%$ max. |
| | 4:1 | | $\pm 0.5\%$ max. |
| Load Voltage Regulation | 2:1 | | $\pm 0.4\%$ max. |
| (10% to 100% full load) | 4:1 | | $\pm 0.5\%$ typ. |
| Minimum Load | | | 0% |
| Output Ripple and Noise (20MHz limited) | | | 50mVp-p max. |
| Operating Frequency | 2:1 | 200kHz min. / 500kHz max. | |
| | 4:1 | 100kHz min. / 300kHz max. | |
| Efficiency at Full Load | | | See Selection Guide |
| Quiescent Current | RS-05xxS_D | | 40mA typ. |
| Nominal input Voltage | RS-12xxS_D | | 32mA typ. |
| (Standard, /H2 and /H3) | RS-24xxS_D, SZ_DZ | | 25mA typ. |
| | RS-48xxS_D, SZ_DZ | | 15mA typ. |
| CTRL Pin drive current /see Notes) | | | 3mA typ, 6mA max. |
| Quiescent Input Current when Converter is OFF | | | 10mA max. |
| Isolation Voltage | Standard | (tested for 1 second) | 1000VDC |
| | | (rated for 1 minute) | 500VAC / 60Hz |
| | /H2 Version | (tested for 1 second) | 2000VDC |
| | | (rated for 1 minute) | 1000VAC / 60Hz |
| | /H3 Version | (tested for 1 second) | 3000VDC |
| | | (rated for 1 minute) | 1500VAC / 60Hz |
| Isolation Capacitance | Standard | 2:1 Single | 10pF min. / 40pF typ. / 60pF max. |
| Isolation Capacitance | /H2 and /H3 | 2:1 Single | 5pF min. / 30pF typ. / 60pF max. |
| Isolation Capacitance | Standard | 2:1 Dual | 120pF min. / 170pF typ. / 250pF max. |
| Isolation Capacitance | /H2 and /H3 | 2:1 Dual | 5pF min. / 30pF typ. / 60pF max. |
| Isolation Capacitance | Standard | 4:1 Single/Dual | 200pF max. |
| Isolation Capacitance | /H2 and /H3 | 4:1 Single/Dual | 30pF max. |
| Isolation Resistance | | | $>1\text{G}\Omega$ min. |
| Short Circuit Protection | | | Continuous |
| Operating Temperature Range (free air convection) | | | -40°C to $+85^\circ\text{C}$ (see Graph) |
| Storage Temperature Range | | | -55°C to $+125^\circ\text{C}$ |
| Relative Humidity | | | 95% RH |
| Package Weight | | | 4.7g |
| Packing Quantity | | | 22 pcs per Tube |
| MTBF ($+25^\circ\text{C}$) | } Detailed Information see Application Notes chapter "MTBF" | using MIL-HDBK 217F | 1685×10^3 hours |
| ($+85^\circ\text{C}$) | | using MIL-HDBK 217F | 254×10^3 hours |

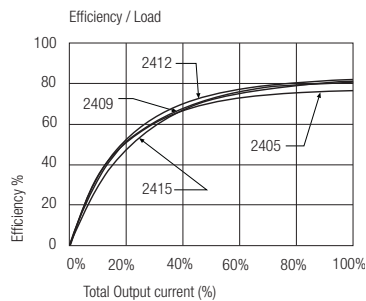
Derating-Graph (Ambient Temperature)



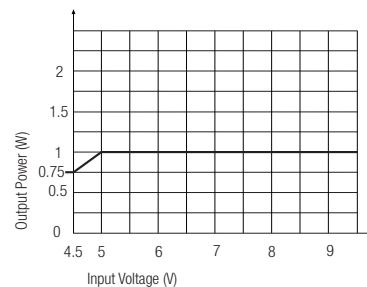
RSO

Typical Characteristics

RSO-24xxS

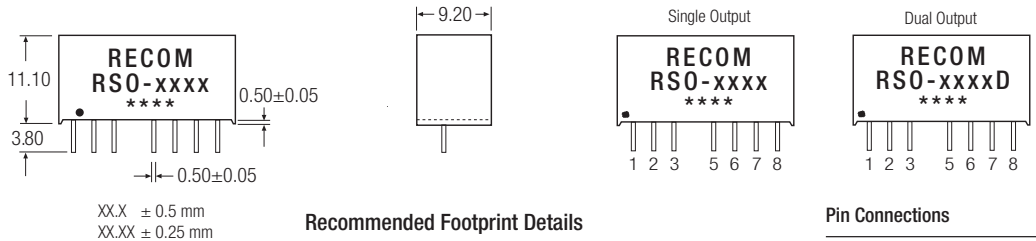


RSO-all types

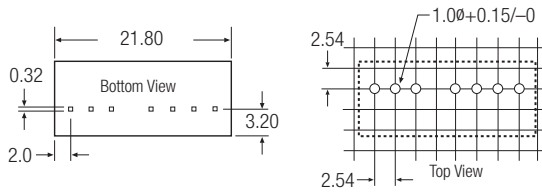


Package Style and Pinning (mm)

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.

Notes

Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter

Certifications

| | | | | |
|---------------------------|--------------------|---------------------------|-------------------|---------------------|
| EN General Safety | Report: PS-R7219C1 | EN60950-1:2001 + A11:2004 | EN Medical Safety | Report: PS071001601 |
| EN60601-1:1990 + A11:1996 | | | | |

Pin 8 (NC*) This pin is used internally and must have no external connection.

Pin 5 (NC) Not connected internally.

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.

RSO

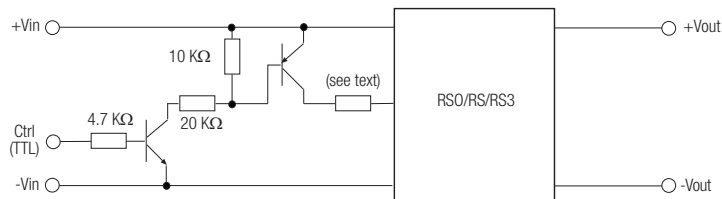
Application Examples

TTL Remote CTRL Circuit

Control Pin Input Current: 10mA

Voltage Set Point Accuracy with external input/output capacitors refer to recommended test circuit: typ. ± 1% max. ±2%

Control Pin (CTRL) Input Current, control voltage applied via 1K resistor, output voltage must reduce to 0V: typ. 3mA max. 6mA



Voltage to be applied via a limiting resistor with a recommended value of 1K for RSO-05xx; 3.3K for RSO-12xx; RSO-24xx and 10K for RSO-48xx.

Isolated Remote CTRL Circuit

