

# Features

## Regulated Converters

- 2:1 and 4:1 Wide Input Voltage Ranges
- 1kVDC, 2kVDC & 3kVDC Isolation
- UL94V-0 Package Material
- 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 RS 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.

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

Part Number	Input Voltage Range (VDC)	Rated Output Voltage (VDC)	Output Current Full Load (mA)	Efficiency typ. (%)	Max Capacitive Load
RS-xx3.3S (H2/H3)	4.5-9, 9-18 18-36, 36-72	3.3	500	68-69 70-73	4700µF
RS-xx05S (H2/H3)	4.5-9, 9-18 18-36, 36-72	5	400	73-75 78	1000µF
RS-xx09S (H2/H3)	4.5-9, 9-18 18-36, 36-72	9	222	74-78 81	1000µF
RS-xx12S (H2/H3)	4.5-9, 9-18 18-36, 36-72	12	166	75-80 83	1000µF
RS-xx15S (H2/H3)	4.5-9, 9-18 18-36, 36-72	15	134	75-80 83	1000µF
RS-xx3.3D (H2/H3)	4.5-9, 9-18 18-36, 36-72	±3.3	±250	68-69 70-73	±2200µF
RS-xx05D (H2/H3)	4.5-9, 9-18 18-36, 36-72	±5	±200	73-75 78	±680µF
RS-xx09D (H2/H3)	4.5-9, 9-18 18-36, 36-72	±9	±111	74-78 81	±680µF
RS-xx12D (H2/H3)	4.5-9, 9-18 18-36, 36-72	±12	±83	75-80 83	±680µF
RS-xx15D (H2/H3)	4.5-9, 9-18 18-36, 36-72	±15	±67	75-80 83	±680µF
RS-xx3.3SZ (H2/H3)	9-36 18-72	3.3	500	75 75	4700µF
RS-xx05SZ (H2/H3)	9-36 18-72	5	400	80 80	1000µF
RS-xx09SZ (H2/H3)	9-36 18-72	9	222	80 80	1000µF
RS-xx12SZ (H2/H3)	9-36 18-72	12	166	83 83	1000µF
RS-xx15SZ (H2/H3)	9-36 18-72	15	134	84 84	1000µF
RS-xx3.3DZ (H2/H3)	9-36 18-72	±3.3	±250	73 73	±2200µF
RS-xx05DZ (H2/H3)	9-36 18-72	±5	±200	77 77	±680µF
RS-xx09DZ (H2/H3)	9-36 18-72	±9	±111	80 80	±680µF
RS-xx12DZ (H2/H3)	9-36 18-72	±12	±83	81 81	±680µF
RS-xx15DZ (H2/H3)	9-36 18-72	±15	±67	83 83	±680µF

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

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

# ECONOLINE

## DC/DC-Converter

with 3 year Warranty

# RECOM

## 2 Watt

## SIP8 Isolated

## Single & Dual

## Output



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

# RS

**2:1 Input**  
(RS-S/D)

xx = 4.5-9Vin = 05

xx = 9-18Vin = 12

xx = 18-36Vin = 24

xx = 36-72Vin = 48

**4:1 Input**  
(RS-SZ/DZ)

xx = 9-36Vin = 24

xx = 18-72Vin = 48

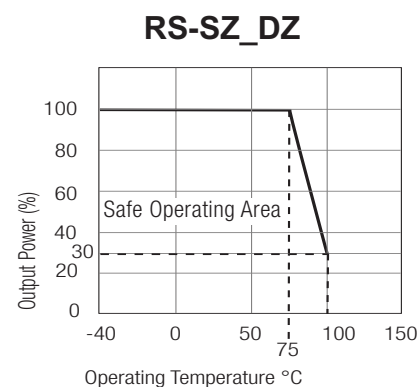
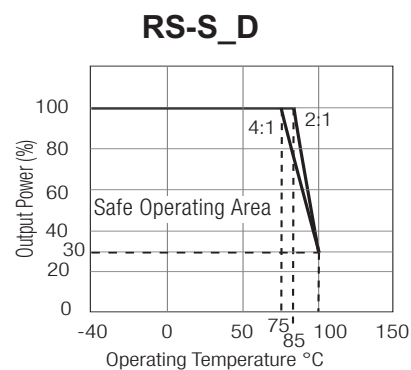
Refer to Application Notes

www.recom-electronic.com

**Electrical Specifications** (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 Accuracy			$\pm 2\%$ typ.
Line Voltage Regulation			$\pm 0.5\%$ max.
Load Voltage Regulation	20%-100% Load	$\pm 0.5\%$ max.	
Minimum Load			0%
Output Ripple and Noise (20MHz limited)			50mVp-p max.
Switching Frequency	Full Load	100kHz min. / 300kHz max.	
Efficiency at Full Load			See Selection Guide
Quiescent Current	RS-05xxS_D	40mA typ.	
Nominal input Voltage (Standard, /H2 and /H3)	RS-12xxS_D	32mA typ.	
	RS-24xxS_D, SZ_DZ	25mA typ.	
	RS-48xxS_D, SZ_DZ	15mA typ.	
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			1G $\Omega$ min.
Short Circuit Protection			Continuous
Operating Temperature Range (No Derating)	2:1	$-40^\circ\text{C}$ to $+85^\circ\text{C}$	
	4:1	$-40^\circ\text{C}$ to $+75^\circ\text{C}$	
Storage Temperature Range			$-55^\circ\text{C}$ 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	$1398 \times 10^3$ hours
( $+85^\circ\text{C}$ )		using MIL-HDBK 217F	$210 \times 10^3$ hours

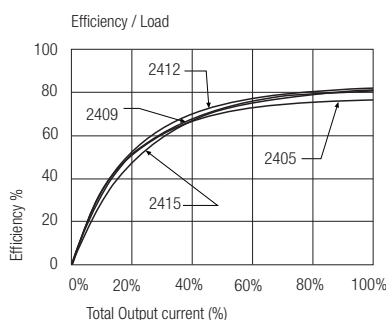
## Derating-Graph (Ambient Temperature)



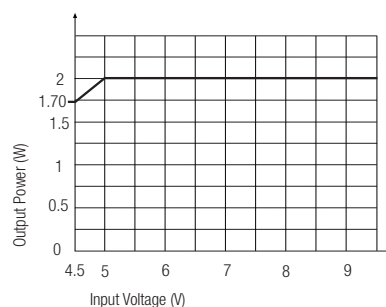
RS

## Typical Characteristics

### RS-24xx

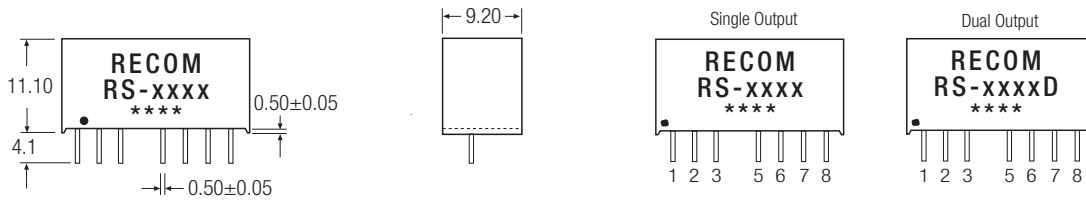


### RS-05xx types



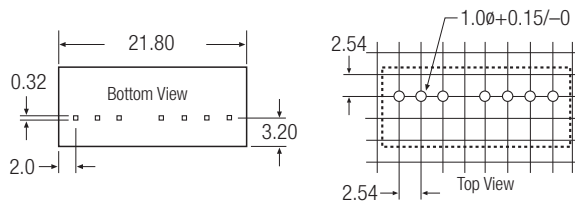
**Package Style and Pinning (mm)**

**8 PIN SIP Package**



XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

**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: SPCLVD1212007	EN60950-1:2006 + A11:2009+A1:2010+A12:2011	
EN Medical Safety	Report: MDD1205098-3 + RM1205098-3	IEC/EN 60601-1 3rd Edition	Medical Report + ISO14971 Risk Assessment

**RS**

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

**Pin 5 (NC)** Not connected internally.

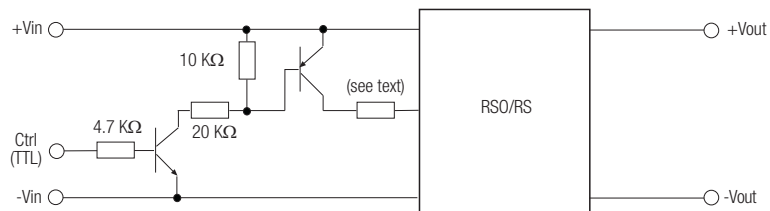
**Pin 3 (CTRL)**

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.

**Application Examples**

**TTL Remote CTRL Circuit**

Control Pin Input Current: 10mA  
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 RS-05xx; 3.3K for RS-12xx; 4.7K for RS-24xx and 10K for RS-48xx.

**Isolated Remote CTRL Circuit**

