

# Features

## Regulated Converters

- 2:1 and 4:1 Wide Input Voltage Ranges
- 1kVDC, 2kVD & 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 Voltageat (VDC)	Output Current Full Load (mA)	Efficiency typ. (%)	Max Capacitive Load
SIP8	4.5-9, 9-18	3.3	500	68-69	4700µF
	18-36, 36-72			70-73	
RS-xx05S (H2/H3)	4.5-9, 9-18	5	400	73-75	1000µF
	18-36, 36-72			78	
RS-xx09S (H2/H3)	4.5-9, 9-18	9	222	74-78	1000µF
	18-36, 36-72			81	
RS-xx12S (H2/H3)	4.5-9, 9-18	12	166	75-80	1000µF
	18-36, 36-72			83	
RS-xx15S (H2/H3)	4.5-9, 9-18	15	134	75-80	1000µF
	18-36, 36-72			83	
RS-xx3.3D (H2/H3)	4.5-9, 9-18	±3.3	±250	68-69	±2200µF
	18-36, 36-72			70-73	
RS-xx05D (H2/H3)	4.5-9, 9-18	±5	±200	73-75	±680µF
	18-36, 36-72			78	
RS-xx09D (H2/H3)	4.5-9, 9-18	±9	±111	74-78	±680µF
	18-36, 36-72			81	
RS-xx12D (H2/H3)	4.5-9, 9-18	±12	±83	75-80	±680µF
	18-36, 36-72			83	
RS-xx15D (H2/H3)	4.5-9, 9-18	±15	±67	75-80	±680µF
	18-36, 36-72			83	
RS-xx3.3SZ (H2/H3)	9-36	3.3	500	75	4700µF
	18-72			75	
RS-xx05SZ (H2/H3)	9-36	5	400	80	1000µF
	18-72			80	
RS-xx09SZ (H2/H3)	9-36	9	222	80	1000µF
	18-72			80	
RS-xx12SZ (H2/H3)	9-36	12	166	83	1000µF
	18-72			83	
RS-xx15SZ (H2/H3)	9-36	15	134	84	1000µF
	18-72			84	
RS-xx3.3DZ (H2/H3)	9-36	±3.3	±250	73	±2200µF
	18-72			73	
RS-xx05DZ (H2/H3)	9-36	±5	±200	77	±680µF
	18-72			77	
RS-xx09DZ (H2/H3)	9-36	±9	±111	80	±680µF
	18-72			80	
RS-xx12DZ (H2/H3)	9-36	±12	±83	81	±680µF
	18-72			81	
RS-xx15DZ (H2/H3)	9-36	±15	±67	83	±680µF
	18-72			83	

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



## 2 Watt SIP8 Isolated Single & Dual Output



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

# RS

**2:1 Input**  
(RS0-S/D)

xx = 4.5-9Vin = 05  
xx = 9-18Vin = 12  
xx = 18-36Vin = 24  
xx = 36-72Vin = 48

**4:1 Input**  
(RS0-SZ/DZ)

xx = 9-36Vin = 24  
xx = 18-72Vin = 48

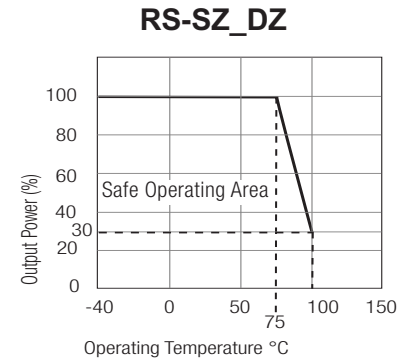
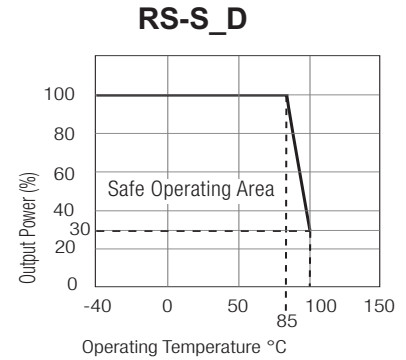
Refer to Application Notes

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	RS-12xxS_D			32mA typ.
(Standard, /H2 and /H3)	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	2:1		-40°C to +85°C	
	4:1		-40°C to +75°C	
Storage Temperature Range				-55°C to +125°C
Relative Humidity				95% RH
Package Weight				4.7g
Packing Quantity				22 pcs per Tube
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F		1398 x 10 <sup>3</sup> hours
(+85°C)		using MIL-HDBK 217F		210 x 10 <sup>3</sup> hours

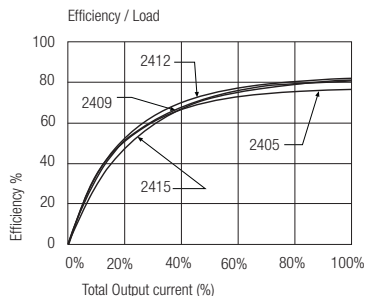
## Derating-Graph (Ambient Temperature)



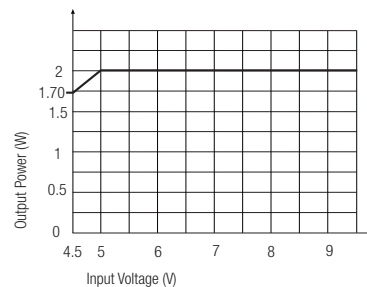
RS

## Typical Characteristics

### RS-24xx

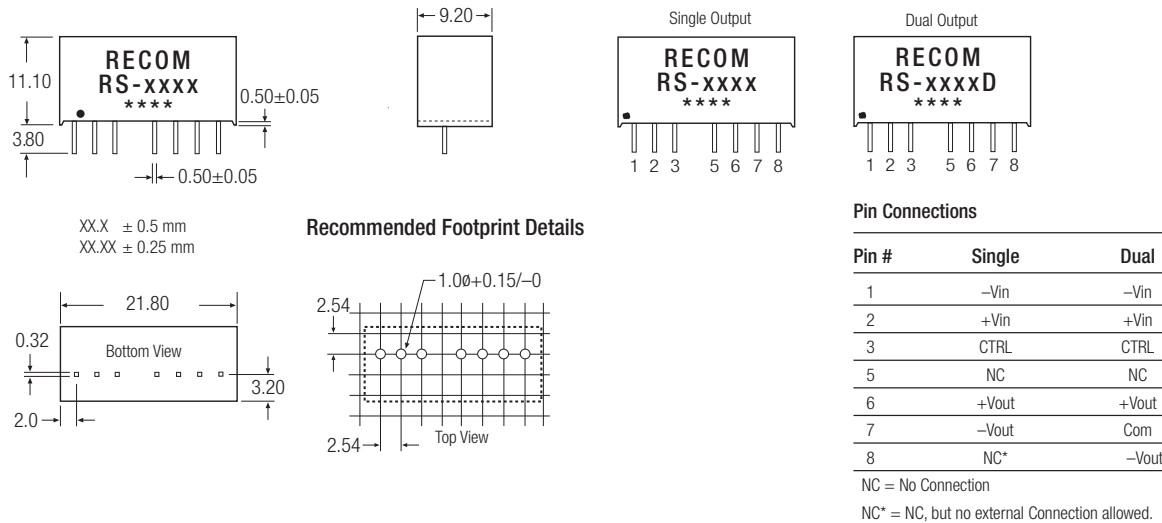


### RS-05xx types



**Package Style and Pinning (mm)**

**8 PIN SIP Package**



**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.

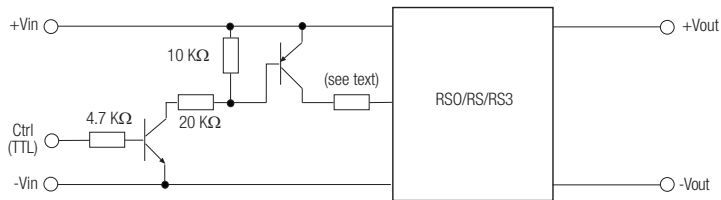
**Application Examples**

**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 RS-05xx; 3.3K for RS-12xx; RS-24xx and 10K for RS-48xx.

**Isolated Remote CTRL Circuit**

