

## Features

## Unregulated Converters

Rev. 1.1

- 1kVDC and 3kVDC Isolation Options
- Approved for Medical Applications
- Suitable for Automated Assembly
- 8, 10 and 12 pin Pinning Style Options
- Optional Continuous Short Circuit Protected
- Efficiency to 85 %

### Selection Guide

Part Number SMD	(3kV)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)
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	74-85
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<sub>A</sub> = 25°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 Vin typ.
	RSS12, RSD12	1%/1% of Vin typ.
Load Voltage Regulation (10% to 100% full load)	3.3V output types	15% typ., 20% max.
	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
No Load Power Consumption	RSS** types	101mW min. / 126mW typ. / 220mW max.
	RSD** types	87mW min. / 130mW typ. / 230mW max.
Maximum Capacitive Load		33µF / ±10µF
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, RSD12	10pF min. / 75pF max.
Isolation Resistance		10 GΩ min.

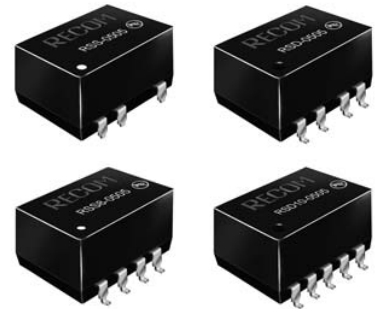
## ECONOLINE

DC/DC-Converter

# RSS\*\* & RSD\*\* Series

## 1 Watt SMD

## Single & Dual Output



EN-60950-1 Certified

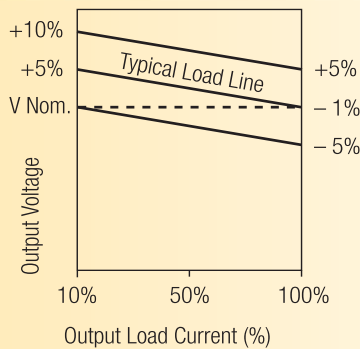
EN-60601-1 Certified (suffix H)

RECOM

**Specifications - continued**

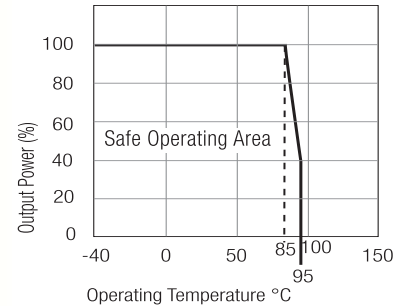
Short Circuit Protection		1 Second
P-Suffix		Continuous
Operating Temperature Range (free air convection)		-40°C to +85°C (see Graph)
Storage Temperature Range		-55°C to +125°C
Reflow Temperature	ROHS compliant	245°C (30 sec) max.
Vapour Phase Process	(for more details see Application Notes)	240°C (90 sec) max.
Relative Humidity		95% RH
Package weight		1.9g (RSS), 2.2g (RSD)
MTBF (+25°C)	} Detailed Information see Application Notes chapter "MTBF"	using MIL-HDBK 217F
(+85°C)		using MIL-HDBK 217F
		1045 x 10 <sup>3</sup> hours
		183 x 10 <sup>3</sup> hours

**Tolerance Envelope**

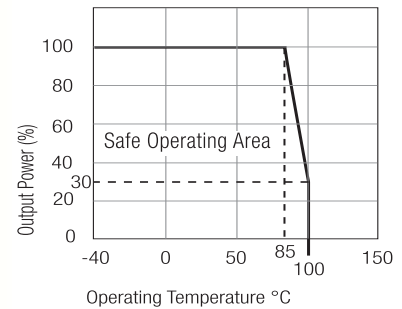


**Derating-Graphs  
(Ambient Temperature)**

**RSS, RSS8, RSD, RSD10**

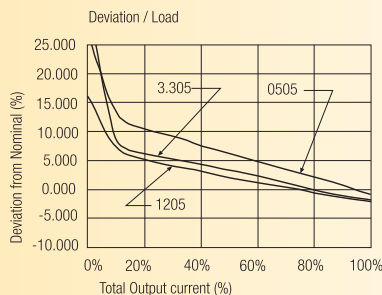
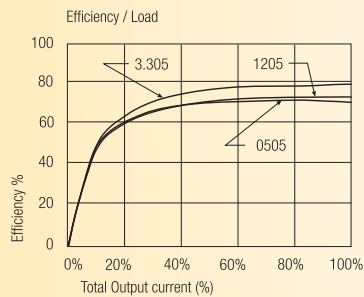


**RSS12, RSD12**

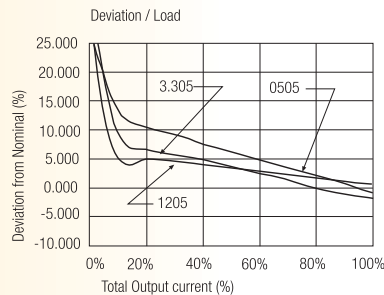
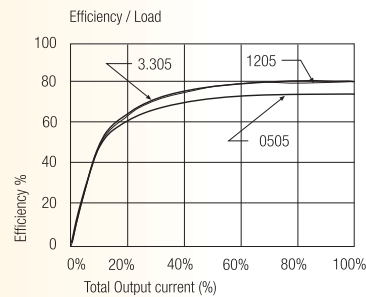


**Typical Characteristics**

**RSS\*\*-xx05**

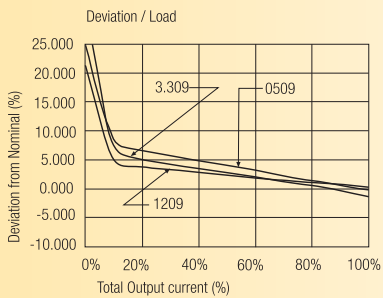
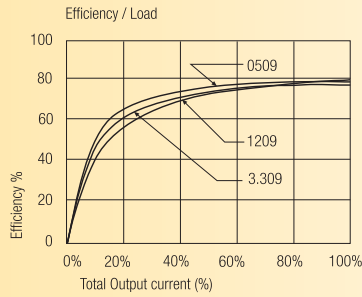


**RSS12-xx05**

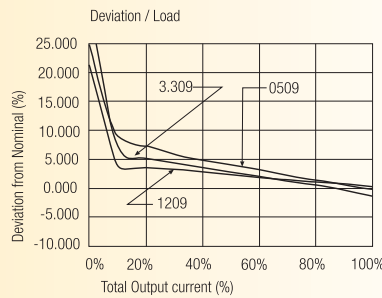
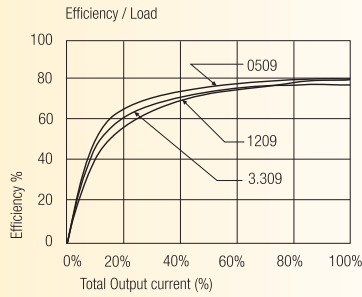


Typical Characteristics

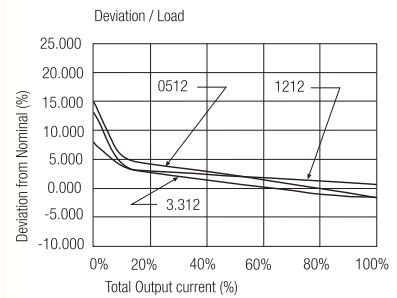
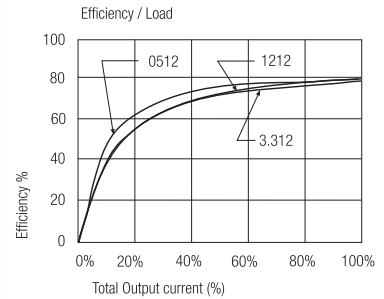
## RSS\*\*-xx09



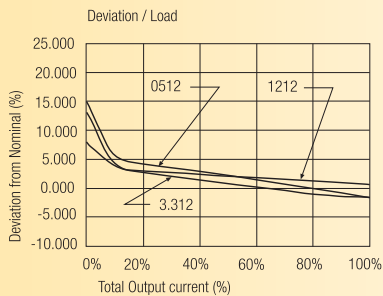
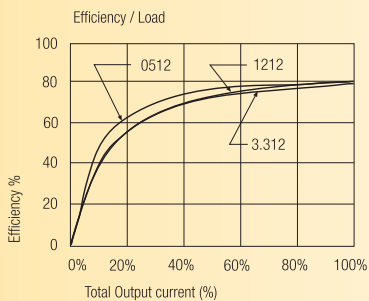
## RSS12-xx09



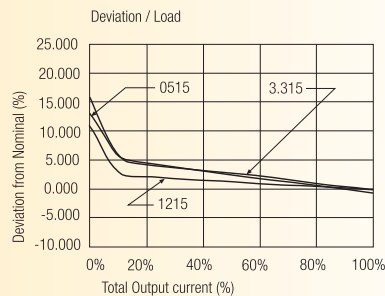
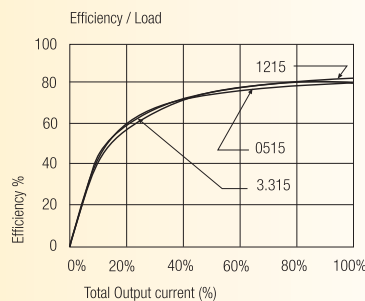
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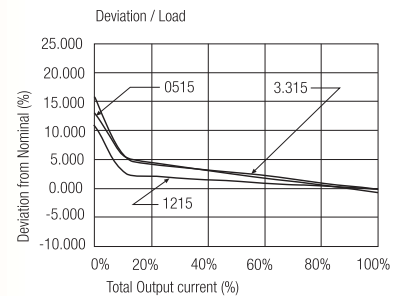
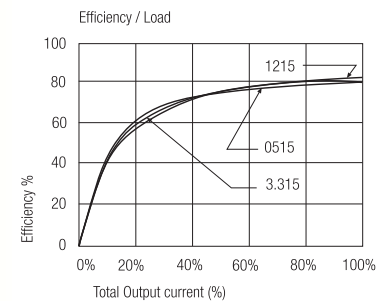
## RSS12-xx12



## RSS\*\*-xx15

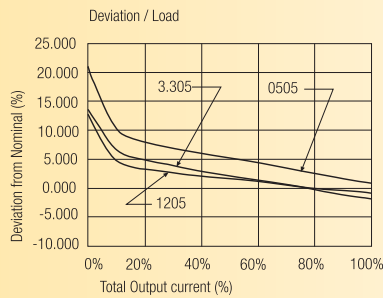
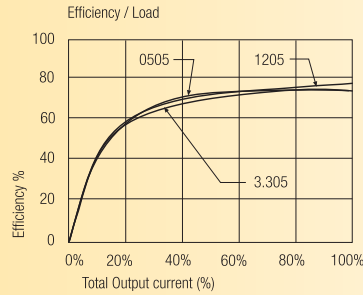


## RSS12-xx15

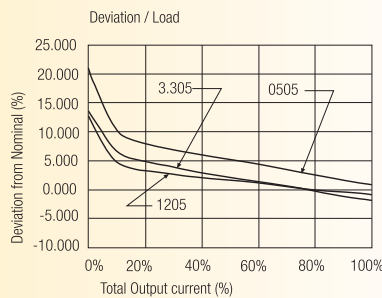
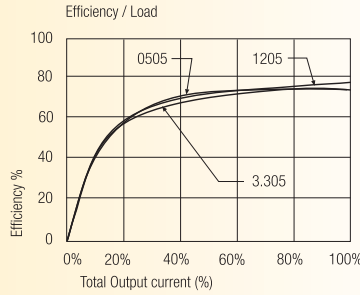


Package Style and Pinning (mm)

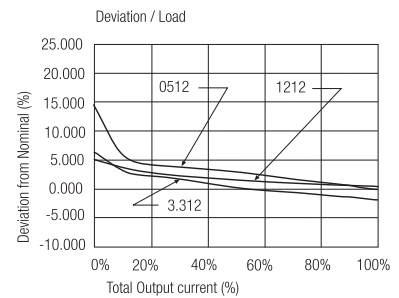
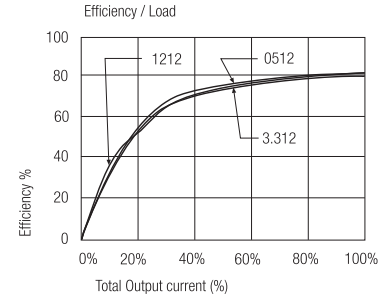
**RSD\*\*-xx05**



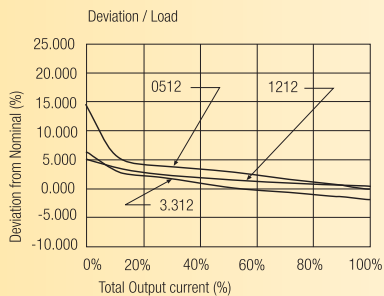
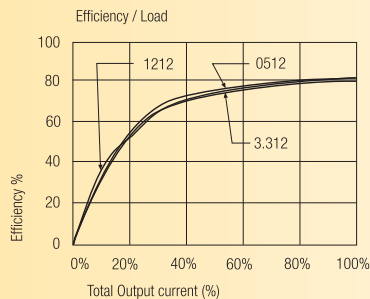
**RSD12-xx05**



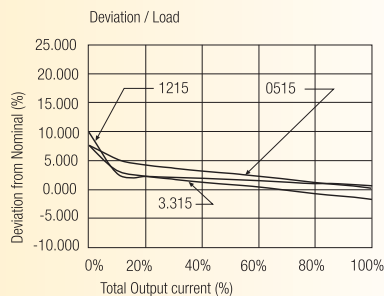
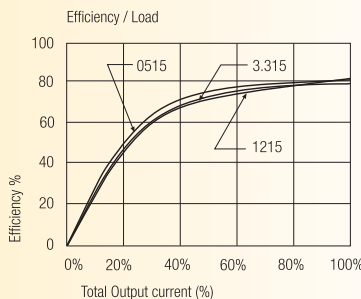
**RSD\*\*-xx12**



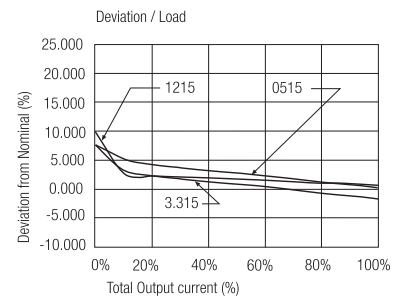
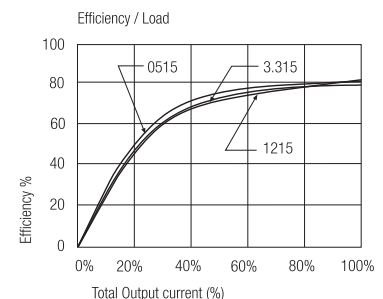
**RSD12-xx12**



**RSD\*\*-xx15**



**RSD12-xx15**

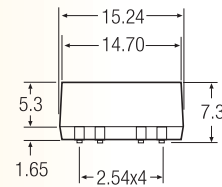
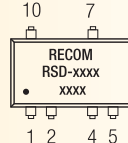
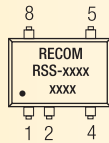
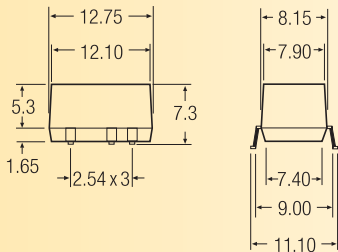


**Package Style and Pinning (mm)**

**5 PIN Single SMD Package**

Note: /H option is available in these pin packages

**6 PIN Dual SMD Package**



**Pin Connections**

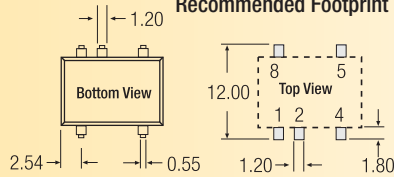
Pin #	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
4	-Vout	Com
5	+Vout	-Vout
7	No Pin	+Vout
8	NC	No Pin
10	No Pin	NC

NC = No Connection

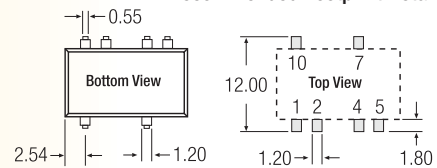
XX.X ± 0.5 mm

XX.XX ± 0.25 mm

**Recommended Footprint Details**



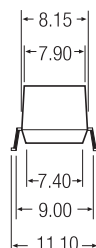
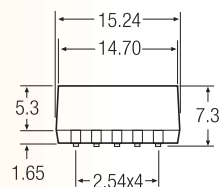
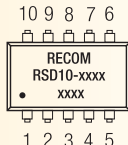
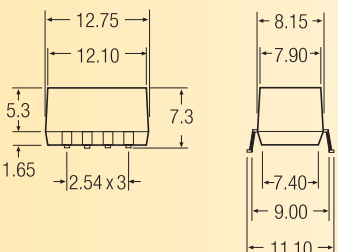
**Recommended Footprint Details**



**8 PIN Single SMD Package**

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

**10 PIN Dual SMD Package**



**Pin Connections**

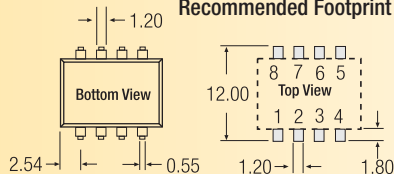
Pin #	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	NC	NC
4	-Vout	Com
5	+Vout	-Vout
6	NC	NC
7	NC	+Vout
8	NC	NC
9	-	NC
10	-	NC

NC = No Connection

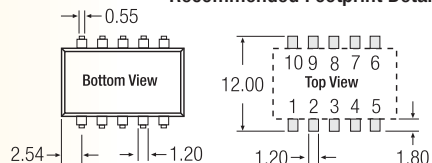
XX.X ± 0.5 mm

XX.XX ± 0.25 mm

**Recommended Footprint Details**



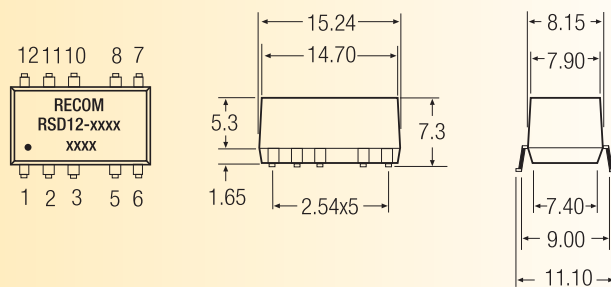
**Recommended Footprint Details**



### Package Style and Pinning (mm)

#### 12 PIN Single and Dual SMD Package

Note: /H option is available in this pin package



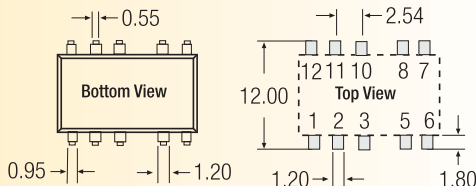
#### Pin Connections

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