

Features

Unregulated Converters

Rev.1.1

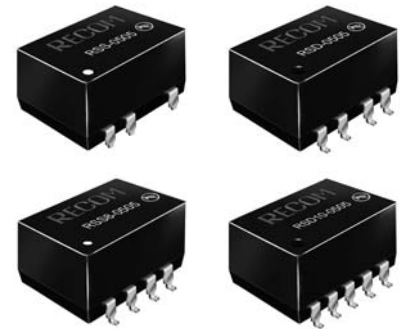
- 1kVDC and 3kVDC Isolation Options
- Approved for Medical Applications
- Suitable for Automated Assembly
- 8, 10 and 12 pin Pinning Style Options
- Optional Continuous Short Circuit Protected
- Efficiency to 85 %

ECONOLINE

DC/DC-Converter

RSS** & RSD** Series

1 Watt SMD Single & Dual Output



EN-60950-1 Certified
EN-60601-1 Certified (suffix H)

RECOM

Selection Guide

Part Number		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)

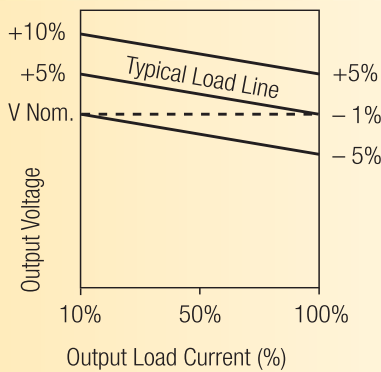
Specifications (measured at $T_A = 25^\circ\text{C}$, nominal input voltage, full load and after warm-up)

Input Voltage Range		±10%
Output Voltage Accuracy		±5% max.
Line Voltage Regulation	RSS, RSS8, RSD, RSD10	1.2%/1% of V_{in} typ.
	RSS12, RSD12	1%/1% of V_{in} 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.

Specifications - continued

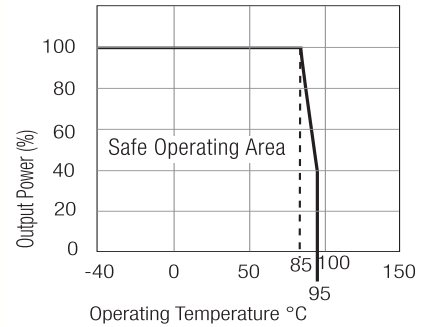
Short Circuit Protection		1 Second	
P-Suffix		Continuous	
Operating Temperature Range (free air convection)		-40°C to +85°C (see Graph)	
Storage Temperature Range		-55°C to +125°C	
Reflow Temperature	ROHS compliant	245°C (30 sec) max.	
Vapour Phase Process	(for more details see Application Notes)	240°C (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	1045 x 10 ³ hours
(+85°C)		using MIL-HDBK 217F	183 x 10 ³ hours

Tolerance Envelope

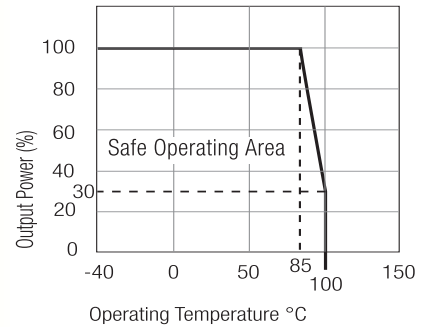


**Derating-Graphs
(Ambient Temperature)**

RSS, RSS8, RSD, RSD10

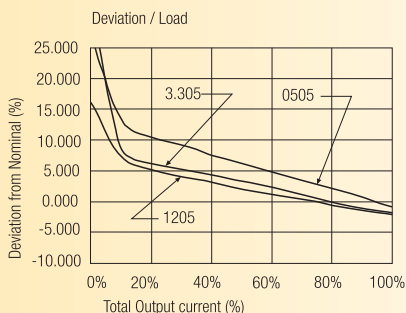
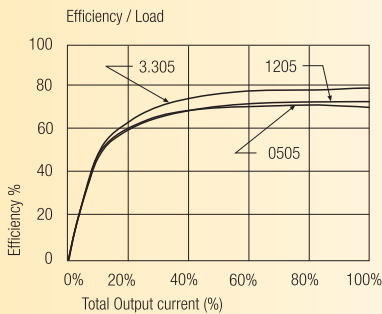


RSS12, RSD12

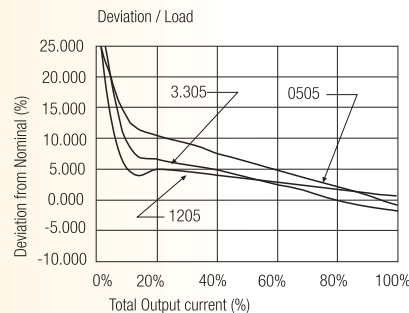
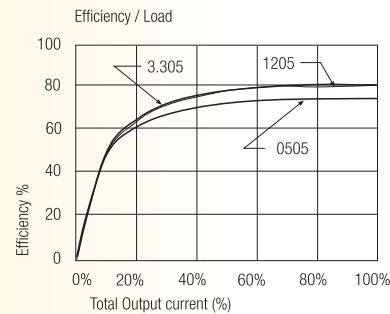


Typical Characteristics

RSS-xx05**

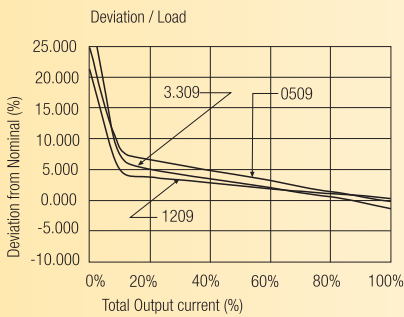
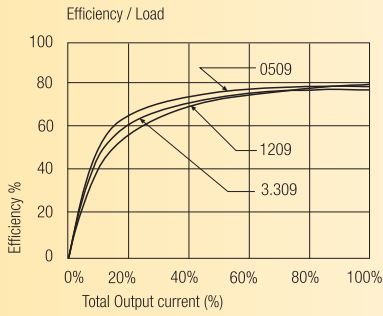


RSS12-xx05

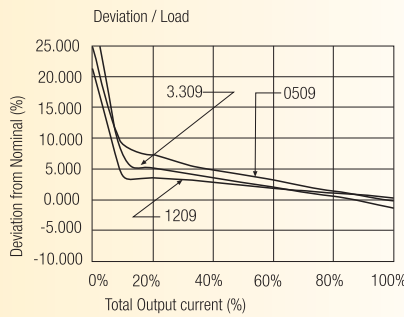
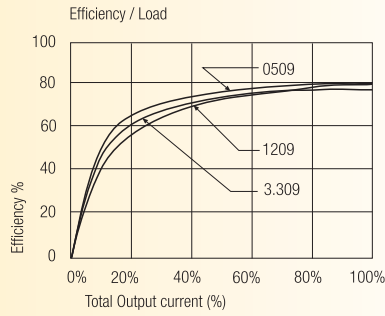


Typical Characteristics

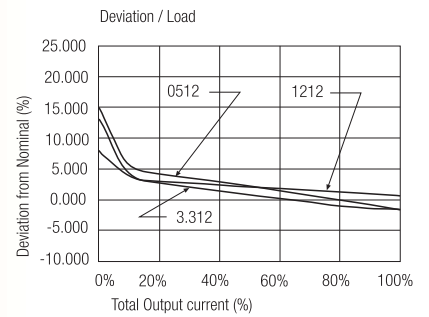
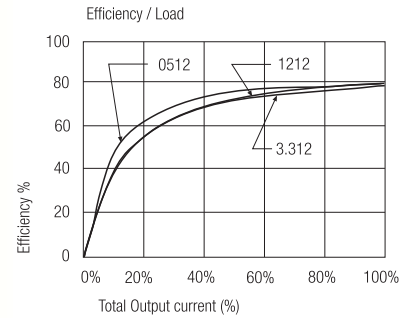
RSS**-xx09



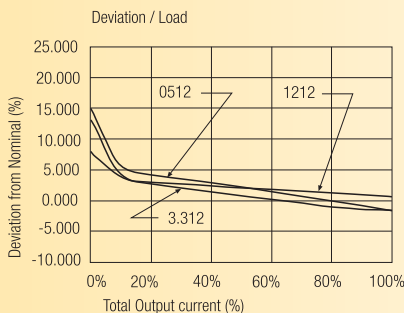
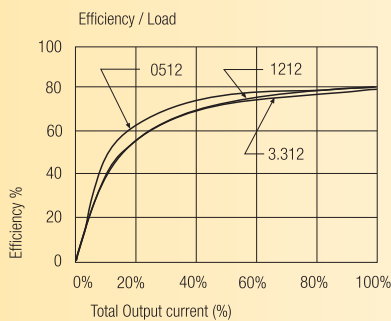
RSS12-xx09



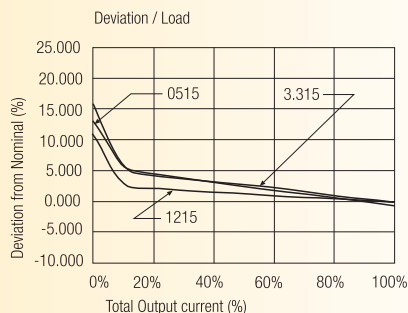
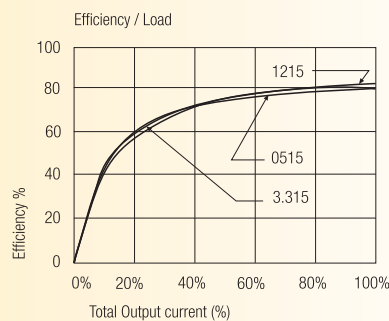
RSS**-xx12



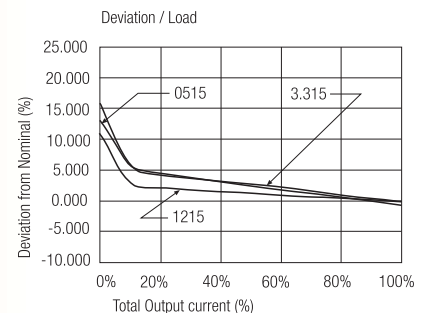
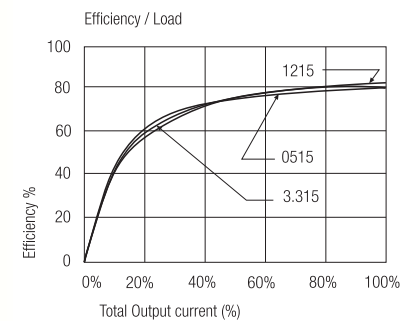
RSS12-xx12



RSS**-xx15

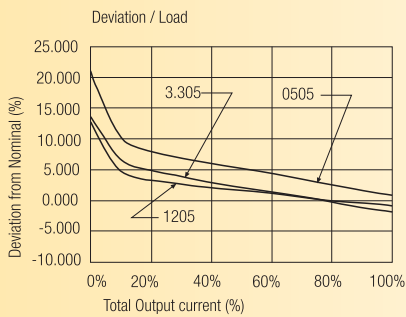
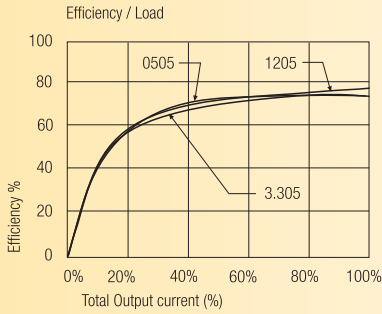


RSS12-xx15

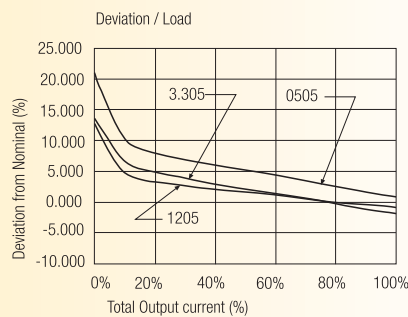
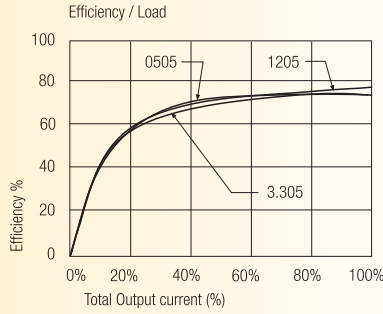


Package Style and Pinning (mm)

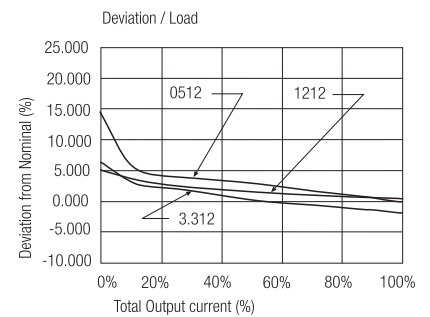
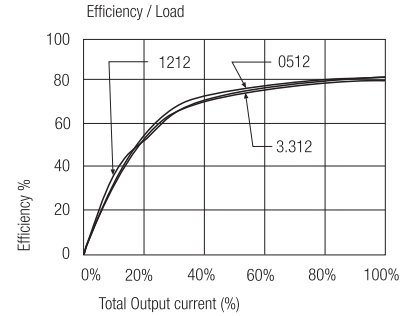
RSD-xx05**



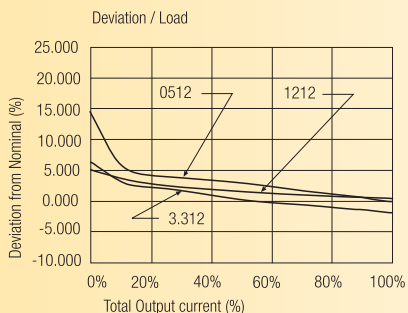
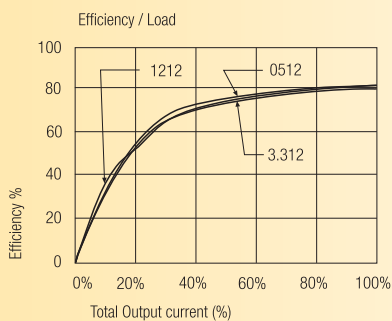
RSD12-xx05



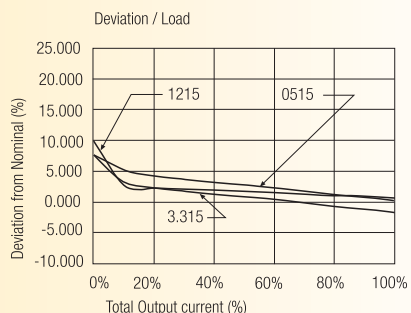
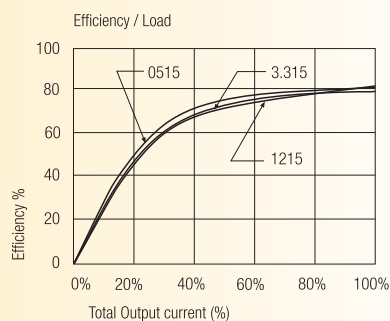
RSD-xx12**



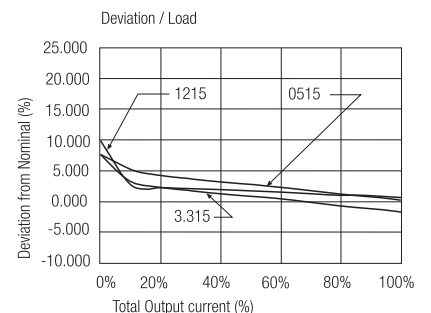
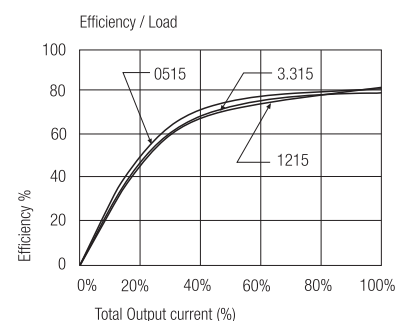
RSD12-xx12



RSD-xx15**



RSD12-xx15



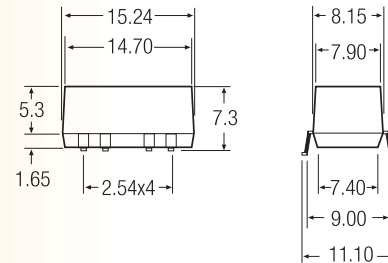
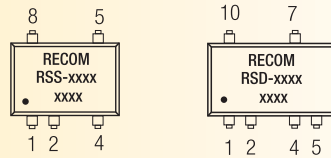
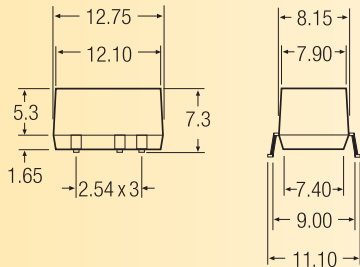
Package Style and Pinning (mm)



5 PIN Single SMD Package

Note: /H option is available in these pin packages

6 PIN Dual SMD Package



Pin Connections

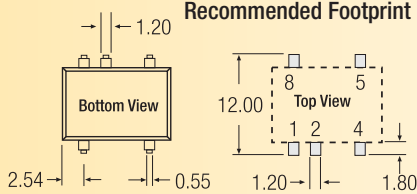
Pin #	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
4	-Vout	Com
5	+Vout	-Vout
7	No Pin	+Vout
8	NC	No Pin
10	No Pin	NC

NC = No Connection

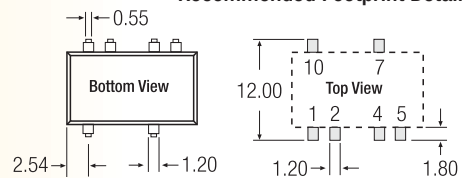
XX.X ± 0.5 mm

XX.XX ± 0.25 mm

Recommended Footprint Details



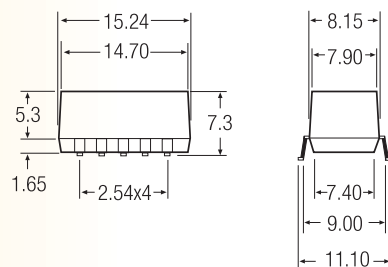
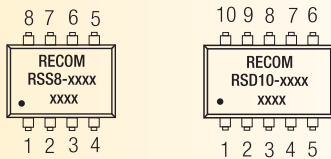
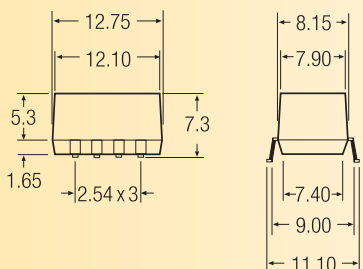
Recommended Footprint Details



8 PIN Single SMD Package

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

10 PIN Dual SMD Package



Pin Connections

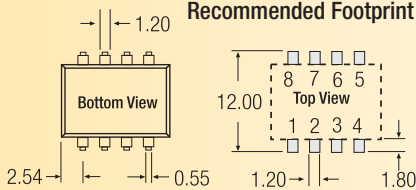
Pin #	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	NC	NC
4	-Vout	Com
5	+Vout	-Vout
6	NC	NC
7	NC	+Vout
8	NC	NC
9	-	NC
10	-	NC

NC = No Connection

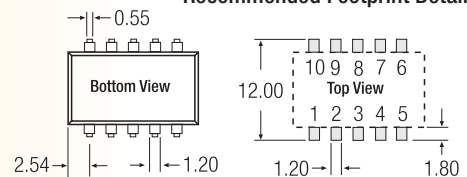
XX.X ± 0.5 mm

XX.XX ± 0.25 mm

Recommended Footprint Details



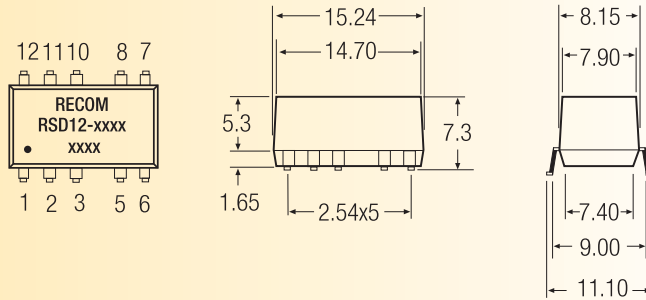
Recommended Footprint Details



Package Style and Pinning (mm)

12 PIN Single and Dual SMD Package

Note: /H option is available in this pin package



Pin Connections

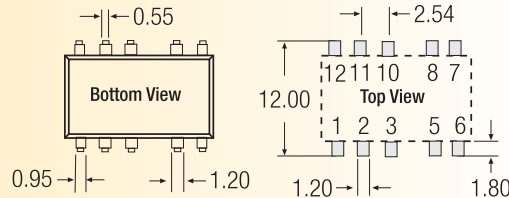
Pin #	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	NC	NC
5	-Vout	Com
6	NC	-Vout
7	NC	NC
8	+Vout	+Vout
10	NC	NC
11	NC	NC
12	NC	NC

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