

Features

Unregulated Converters

- 1:1 input range
- Efficiency up to 82%
- 1kVDC/1s or 2kVDC/1s isolation option
- Wide operating temperature range from -40°C to +100°C at full load
- UL60950-1 and IEC/EN60950-1 certified
- 1W SMD package



R1S/E

**1 Watt
SMD
Single Output**



Description

The R1S/E series is an unregulated DC/DC converter in fully encapsulated open Frame package style. This series has been designed to offer exceptionally high efficiency at low loads and an extended operating temperature range. Uses include battery powered supplies, green energy applications and general isolating/converting DC power where board space and high efficiency is a premium.

Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [µF]
R1S ⁽³⁾ -3.305/E ^(4,5)	3.3	5	200	81	2200
R1S ⁽³⁾ -0505/E ^(4,5)	5	5	200	81	2200
R1S ⁽³⁾ -1205/E ^(4,5)	12	5	200	82	2200
R1S ⁽³⁾ -2405/E ^(4,5)	24	5	200	80	2200



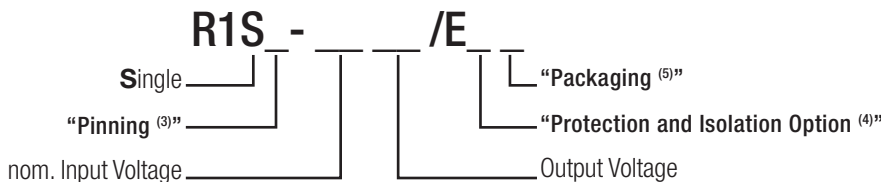
Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: Max Cap Load is tested at nominal input and full resistive load and is defined as the capacitive load that will allow start up in under 1s without damage to the converter



Model Numbering



UL60950-1 certified
CAN/CSA-C22.2 No. 60950-1-07 certified
IEC/EN60950-1 certified
EN55032 compliant

Notes:

Note3: 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)

Note4: standard part is without continuous short circuit protection
add suffix „P“ for continuous short circuit protection
add suffix „H“ for 2kVDC/1s isolation (not available for R1S8)
or add suffix „HP“ for 2kVDC/1s isolation and continuous short circuit protection

Note5: add suffix „R“ for tape and reel packaging (compatible with all other suffixes)

Ordering Examples:

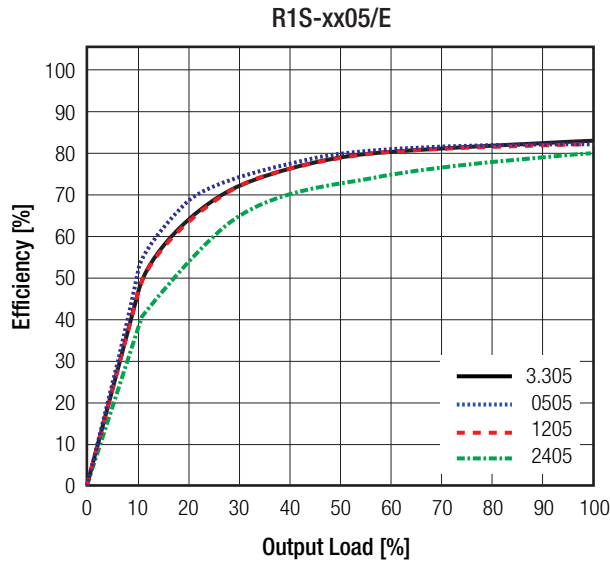
- R1S8-3.305/E = Single Output, 8 pins out of 8 fitted, 3.3Vin, 5Vout
- R1S-3.305/EH = Single Output, 5 pins out of 8 fitted, 3.3Vin, 5Vout with 2kVDC/1s isolation
- R1S8-0505/EP = Single Output, 8 pins out of 8 fitted, 5Vin, 5Vout with continuous short circuit protection
- R1S-0505/EHP-R = Single Output, 8 pins out of 8 fitted, 5Vin, 5Vout with 2kVDC/1s isolation, continuous short circuit protection and tape and reel packaging

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load ⁽⁵⁾		0%		
Internal Operating Frequency		20kHz		90kHz
Output Ripple and Noise	20MHz BW		50mVp-p	100mVp-p

Efficiency vs. Load



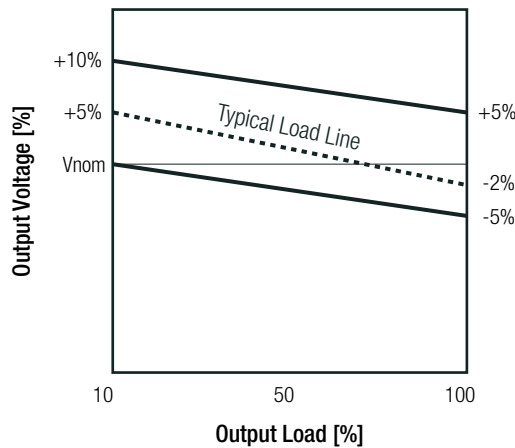
REGULATIONS

Parameter	Condition	Value
Output Accuracy		±5.0% max.
Line Regulation	low line to high line, full load	±1.2% typ.
Load Regulation	10% to 100% load	15.0% max.

Notes:

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

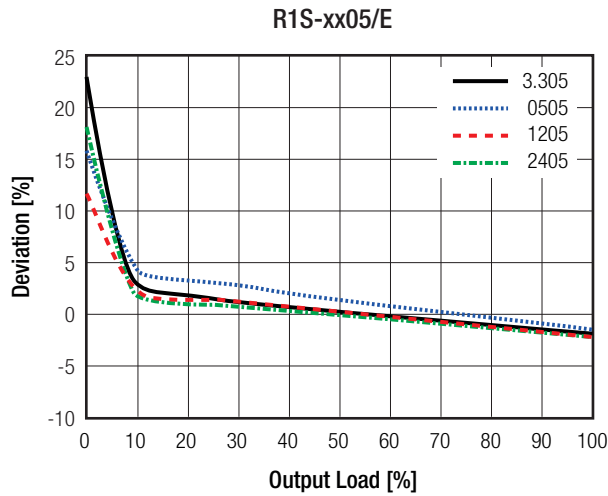
Tolerance Envelope



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Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Deviation vs. Load



PROTECTIONS

Parameter	Type		Value
	without suffix	with suffix "/P"	
Short Circuit Protection (SCP)	below 100mΩ		1 second continuous
Isolation Voltage ⁽⁷⁾	I/P to O/P	without suffix	1kVDC 500VAC/60Hz
		with suffix "/H"	2kVDC 1kVAC/60Hz
Isolation Resistance			10GΩ min.
Isolation Capacitance			75pF max.
Insulation Grade			functional

Notes:

Note7: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note8: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

ENVIRONMENTAL

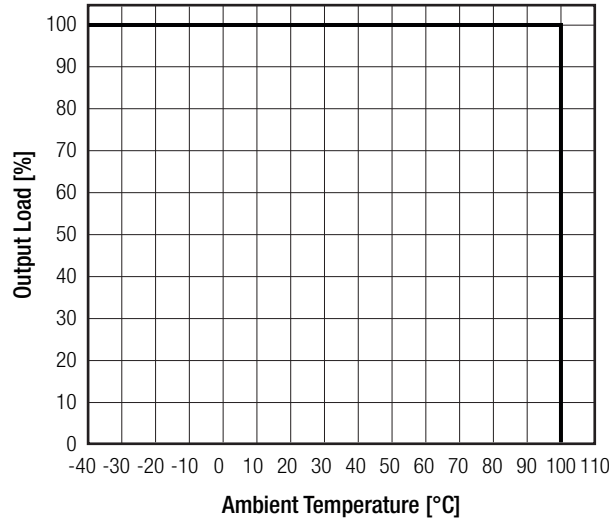
Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection, refer to "Derating Graph"		-40°C to +100°C
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	3459 x 10 ³ hours
		+100°C	756 x 10 ³ hours

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Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Derating Graph

(@ Chamber and free air convection)



SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E358085-A2-UL	UL60950-1, 2nd Edition:2007 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition:2007
Information Technology Equipment, General Requirements for Safety	LVD1605077-08	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Medical electrical equipment Part 1: General requirements for basic safety and essential performance	WD-SE-R-180674-A0	EN60601-1:2006 + A12:2014 IEC60601-1:2005 + A1:2012, 3rd Edition
RoHS2		RoHS-2011/65/EU + AM-2015/863

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case	non-conductive black plastic, (UL94 V-0)
Dimension (LxWxH)		12.75 x 10.7 x 7.0mm
Weight		1.0g typ.

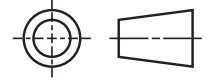
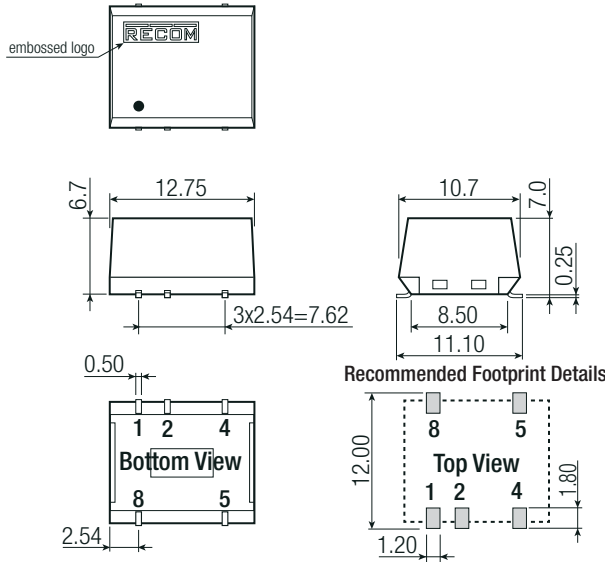
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Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)

5 Pin Single SMD Package

/H option is available in this pin package



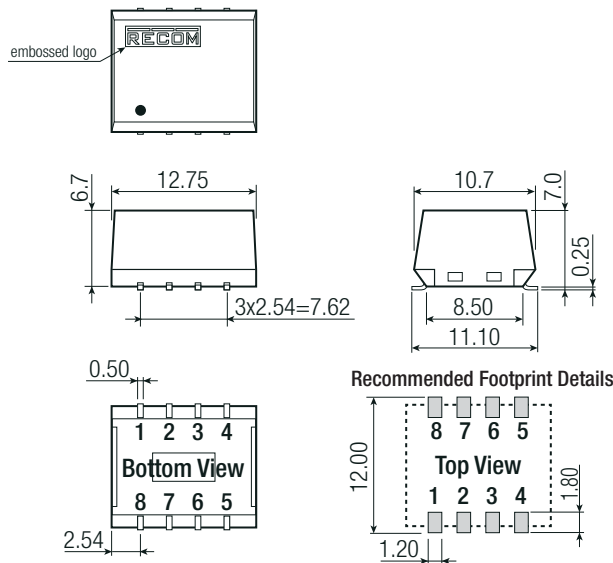
Pinning Information

Pin #	Single
1	-Vin
2	+Vin
4	-Vout
5	+Vout
8	NC

NC = No Connection
Tolerance:
xx.xx= ±0.25mm

8 Pin Single SMD Package

/H option is not available in this pin package



Pinning Information

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

NC = No Connection
Tolerance:
xx.xx= ±0.25mm

PACKAGING INFORMATION

Packaging Dimension (LxWxH)	tube tape and reel (carton)	530.0 x 17.0 x 14.0mm 355.0 x 340.0 x 35.0mm
Packaging Quantity	tube tape and reel	40pcs 500pcs
Tape Width		24.0mm
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.

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