Features

Unregulated Converters

- Efficiency up to 84%
- Low deviation (10%-100% load)
- 1kVDC and 2kVDC isolation option
- IEC/EN/UL60950-1 safety certified
- -40°C to +100°C operating temperature range
- 1W SIP4 package

RECOM
DC/DC Converter

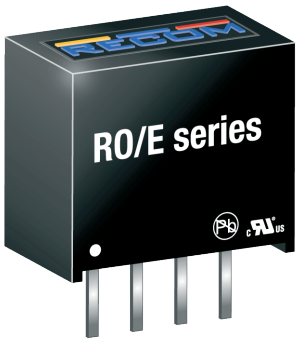
RO/E

1 Watt SIP4 Single Output

3 YEAR warranty

Description

The RO/E series is an unregulated DC/DC converter in standard SIP4 package style. This series has been designed to offer exceptionally high efficiency at low loads, an extended operating temperature range and low deviation (10% to 100% load). Uses include applications with restricted energy budget and industrial applications where a high efficiency level is required.



Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
RO-3.305S/E (3,4)	3.3	5	200	83	2200
RO-0505S/E (3,4)	5	5	200	84	2200
RO-1205S/E (3,4)	12	5	200	84	2200
RO-2405S/E (3,4)	24	5	200	81	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

RoHS 2+ compliant 10 from 10 — REACH compliant — c UL us E358085

UL60950-1 certified
IEC60950-1 certified
EN60950-1 certified

Model Numbering

RO- __ 05S/E __ __

- Input Voltage
- Output Voltage
- **S**ingle
- "Isolation Option (4)"
- "Protection (3)"

Notes:

Note3: standard part is without continuous short circuit protection
add suffix „/P" for continuous short circuit protection

Note4: add suffix „/H" for 2kVDC isolation
or add suffix „/HP" for continuous short circuit protection and 2kVDC Isolation

Ordering Examples:

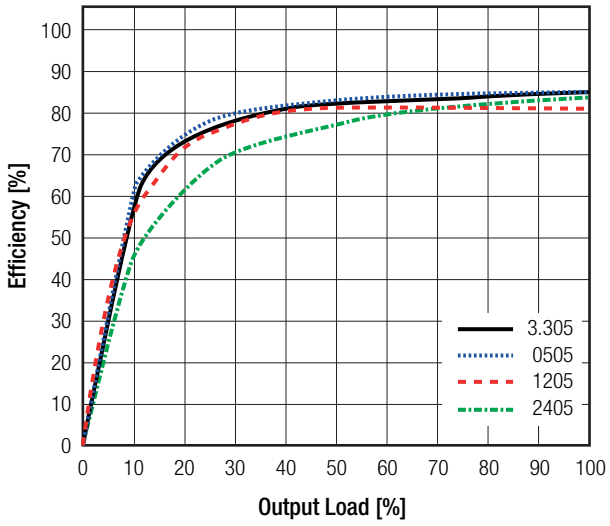
RO-3.305S/EP: 3.3V Input Voltage, 5V Output Voltage, Single Output with continuous short circuit protection
RO-0505S/EHP: 5V Input Voltage, 5V Output Voltage, Single Output with 2kVDC Isolation and continuous short circuit protection

Specifications (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

BASIC CHARACTERISTICS

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

Efficiency vs. Load



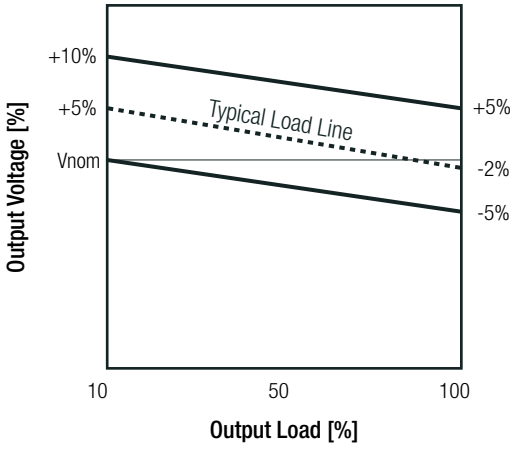
REGULATIONS

Parameter	Condition	Value
Output Accuracy		±5.0% max.
Line Regulation	low line to high line	±1.2% max.
Load Regulation (5)	10% to 100% load	12.0% max.

Notes:

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

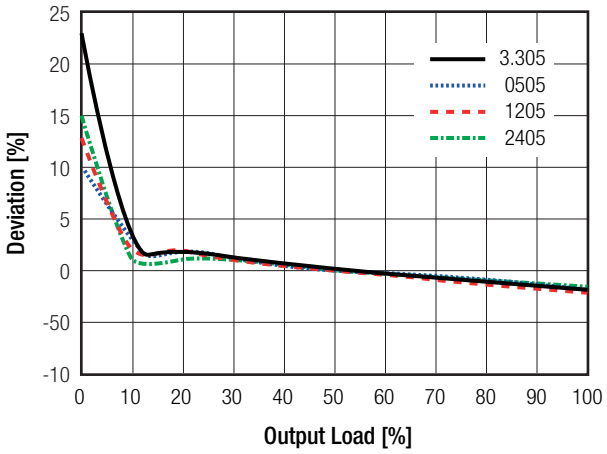
Tolerance Envelope



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Specifications (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

Deviation vs. Load



PROTECTIONS

Parameter	Type			Value
Short Circuit Protection (SCP)	without suffix with suffix "/P"			1 second continuous
Isolation Voltage [6]	I/P to O/P	without suffix	tested for 1 second rated for 1 minute	1kVDC 500VAC/60Hz
		with suffix "/H"	tested for 1 second rated for 1 minute	2kVDC 1kVAC/60Hz
Isolation Resistance				10GΩ min.
Isolation Capacitance				75pF max.
Insulation Grade				basic (IEC/EN60950-1) functional (IEC/EN60601-1)

Notes:

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note7: Refer to local wiring regulations if input over-current protection is also required. Recommended fuse: T1A slow blow type

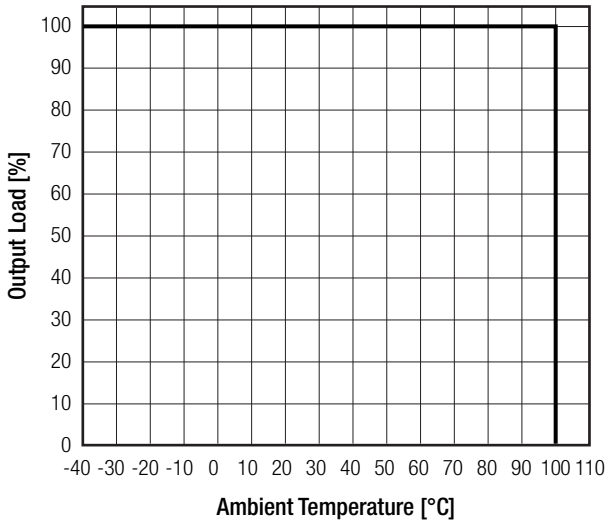
ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	full load (see graph)		-40°C to +100°C
Operating Altitude			2000m (IEC/EN60950-1) 3000m (IEC/EN60601-1)
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +85°C	3459 x 10^3 hours 756 x 10^3 hours

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Specifications (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

Derating Graph



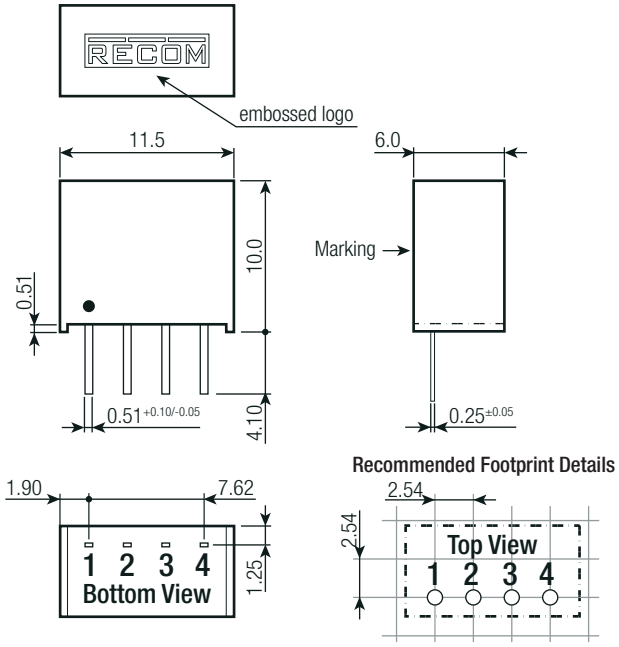
SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report / File Number**	**Standard**
Information Technology Equipment, General Requirements for Safety	LVD1602031	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety	E358085-A4-UL	UL60950-1, 2nd Edition:2007 CAN/CSA C22.2 No. 60950-1-03, 2nd Edition:2007
Medical electrical equipment Part 1: General requirements for basic safety and essential performance	WD-SE-R-180677-A0	EN60601-1:2006 + A12:2014 IEC60601-1:2005 + A1:2012, 3rd Edition
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS 2		RoHS-2011/65/EU + AM-2015/863

DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Material	case potting PCB	non-conductive black plastic, (UL94 V-0) epoxy, (UL94 V-0) FR4, (UL94 V-0)
Dimension (LxWxH)		11.5 x 6.0 x 10.0mm
Weight		1.4g typ.

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Specifications (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

Dimension Drawing (mm)



Pinning Information

Pin #	Single
1	-Vin
2	+Vin
3	-Vout
4	+Vout

Tolerance:
xx.x= ±0.5mm
xx.xx= ±0.25mm

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube	520.0 x 16.0 x 9.0mm
Packaging Quantity	tube	42pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity		95% RH max.

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