

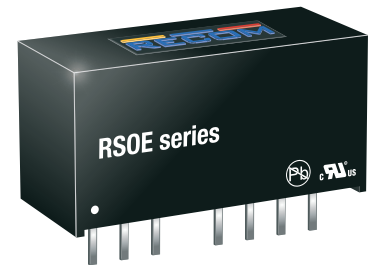
Features

Regulated Converters

- 2:1 Wide input range
- 2kVDC/1 Second isolation
- -40°C To +80°C Operating temperature @ full load
- Industry standard pinout (SIP8)
- EN/UL62368 and UL60950 certified, CB report
- Low cost

RSOE

1 Watt
SIP8
Single Output



RECOM
US
E224736

UL62368-1 certified
C22.2 No. 62368-1-14 certified
UL60950 certified
C22.2 No. 60950-1-07 certified
IEC/EN62368-1 certified
EN55032/55024 compliant
CB Report

Description

The RSOE is a low cost isolated, regulated and short-circuit protected DC/DC converter designed for industrial applications. A compact SIP8 case size, 2:1 input, 2kVDC isolation and a wide operating temperature range of -40°C to +80°C without derating makes the RSOE series ideal for industrial, transport and general-purpose on-board 5V power supplies. Industrial Class A EMC levels can be met with a simple Pi-filter and the converters come with a three year warranty.

Selection Guide

Part Number	Input Voltage Range [VDC]	Input Current @ full load [mA]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [µF]
RSOE-0505S/H2	4.5 - 9	265	5	200	76	6800
RSOE-2405S/H2	18 - 36	52	5	200	80	6800

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

Specifications (measured @ ta= 25°C, nominal Vin, full load unless otherwise specified)

BASIC CHARACTERISTICS						
Parameter	Condition		Min.	Typ.	Max.	
Internal Input Filter			capacitor			
Input Voltage Range	nom. Vin=	5VDC 24VDC	4.5VDC 18VDC	5VDC 24VDC	9VDC 36VDC	
Maximum Reverse Voltage					0VDC	
Input Surge Voltage	100ms max.	nom. Vin=	5VDC 24VDC	15VDC 50VDC		
Quiescent Current		nom. Vin=	5VDC 24VDC	40mA 3mA		
Start-up time					500µs	
Rise time					450µs	
Hold-up time					10µs	
Internal Operating Frequency			130kHz			
Minimum Load			0%			
Output Ripple and Noise ⁽³⁾	20MHz BW, 0-100% load				75mVp-p	
ON/OFF CTRL ⁽⁴⁾	DC-DC ON DC-DC OFF				Open or 0V < Vr < 0.8VDC 2V < Vr < 6VDC	
Input Current of CTRL Pin	5V VCTRL 3.3V VCTRL				15mA 10mA	
Standby Current					0.75mA 1.5mA	

Notes:

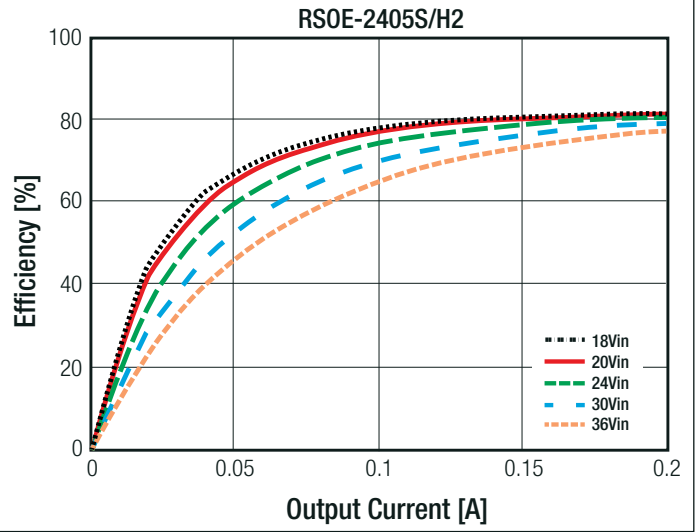
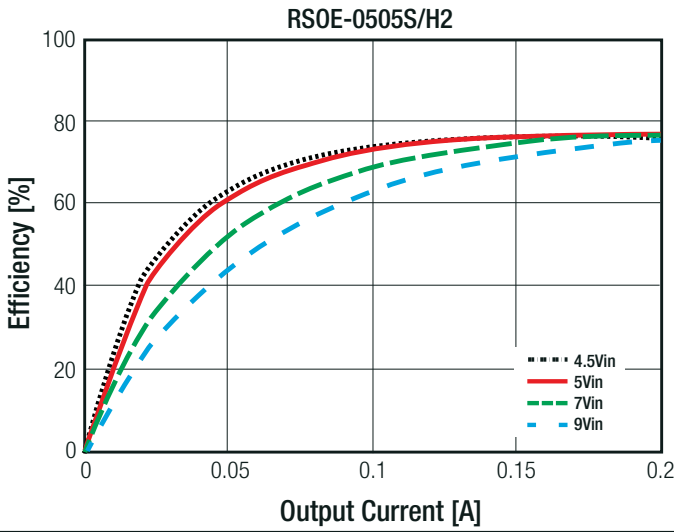
Note3: Measurements are made with a 0.1µF MLCC across output (low ESR)

Note4: Please refer to „Application and Installation“

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Specifications (measured @ Ta= 25°C, nominal Vin, full load unless otherwise specified)

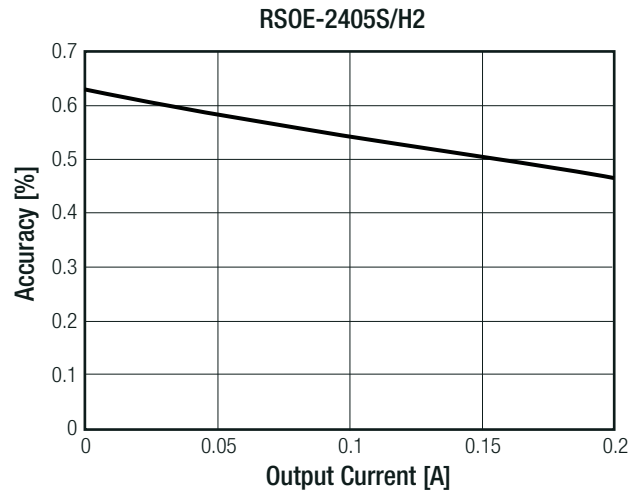
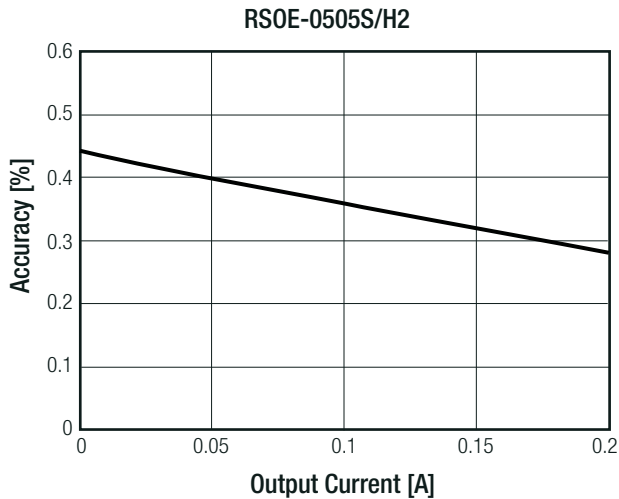
Efficiency vs. Load



REGULATIONS

Parameter	Condition	Value
Output Accuracy	0-100% load	±2.0% max.
Line Regulation	low line to high line, full load	±0.2% max.
Load Regulation	0% to 100% load	±0.5% max.

Accuracy vs. Load
(@ full load)



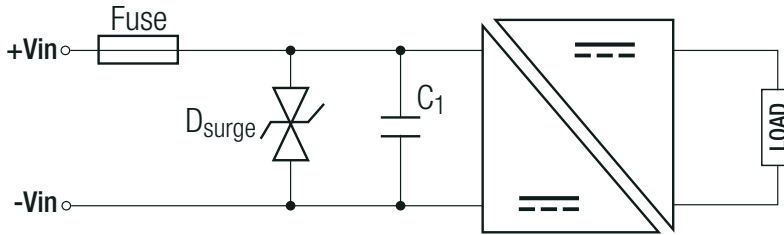
PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ		continuous, auto recovery
Isolation Voltage ⁽⁵⁾	I/P to O/P	tested for 1 second	2kVDC
Isolation Resistance			1GΩ min.
Isolation Capacitance			100pF max.
Insulation Grade			functional

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Specifications (measured @ Ta= 25°C, nominal Vin, full load unless otherwise specified)

Surge Protection Circuit according to EN61000-4-5, Criteria A



nom. Vin	TVS	C1
5VDC	P4SMAJ11A	N/A
24VDC	P4SMAJ36A	220µF/100V

Notes:

Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage

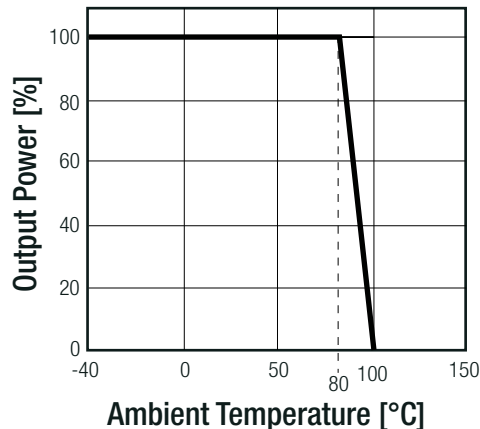
Note6: An input fuse is required if the mains supply is not over-current protected. Recommended fuse: T1A slow blow type

ENVIRONMENTAL

Parameter	Condition	Value
Operating Temperature Range	without derating (see graph)	-40°C to +80°C
Maximum Case Temperature		+105°C
Temperature Coefficient		±0.05%/°C
Operating Altitude		5000m
Operating Humidity	non-condensing	5% - 95% RH max.
Pollution Degree		PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C 3073 x 10 ³ hours +80°C 845 x 10 ³ hours
Vibration		MIL-STD 202G

Derating Graph

(@ Chamber and natural convection 0.1 m/s)



SAFETY AND CERTIFICATIONS

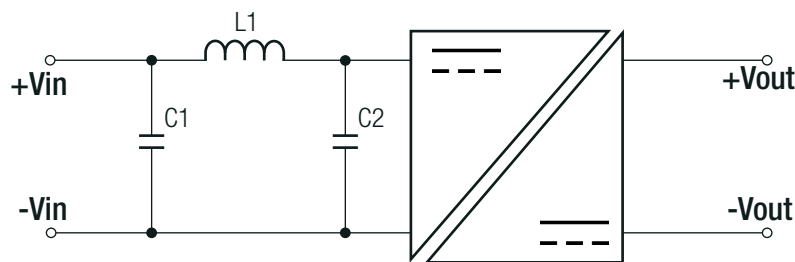
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E224736-A48	UL60950-1, 2nd Edition, 2014 CSA C22.2 No. 60950-1-07, 2nd Ed. 2014
Audio/Video, information and communication technology equipment - Safety requirements		UL62368-1, 2nd Edition, 2014 CSA C22.2 Nr. 62368-1-14, 2nd Ed. 2014
Audio/Video, information and communication technology equipment - Safety requirements (CB Scheme)	L0339m37-CB-1-B1	IEC/EN62368-1, 2nd Edition, 2014
RoHS 2+		RoHS 2011/65/EU + AM2015/863

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Specifications (measured @ Ta= 25°C, nominal Vin, full load unless otherwise specified)

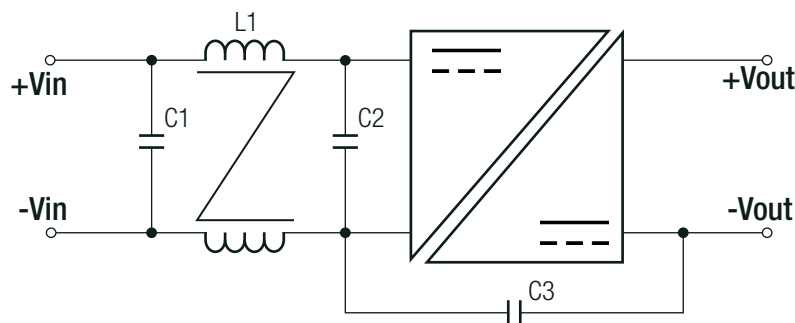
EMC Compliance	Conditions	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external components (see filter suggestion below)	EN55032, Class A EN55032, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024, 2015
ESD Electrostatic discharge immunity test	±8kV Air; ±4kV Contact	IEC6100-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC6100-4-3, Criteria A
Fast Transient and Burst Immunity	DC Power Port: ±0.5kV	IEC6100-4-4, Criteria A
Surge Immunity	DC Power Port: ±0.5kV	IEC6100-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	DC Power Port: 3V	IEC6100-4-6, Criteria A
Power Magnetic Field	50Hz, 1A/m	IEC6100-4-8, Criteria A

EMC Filtering Suggestions for EN55032 Class A



nom. Vin	C1	C2	L1
5VDC	22µF/50V MLCC	22µF/50V MLCC	3µH Choke
24VDC			

EMC Filtering Suggestions for EN55032 Class B



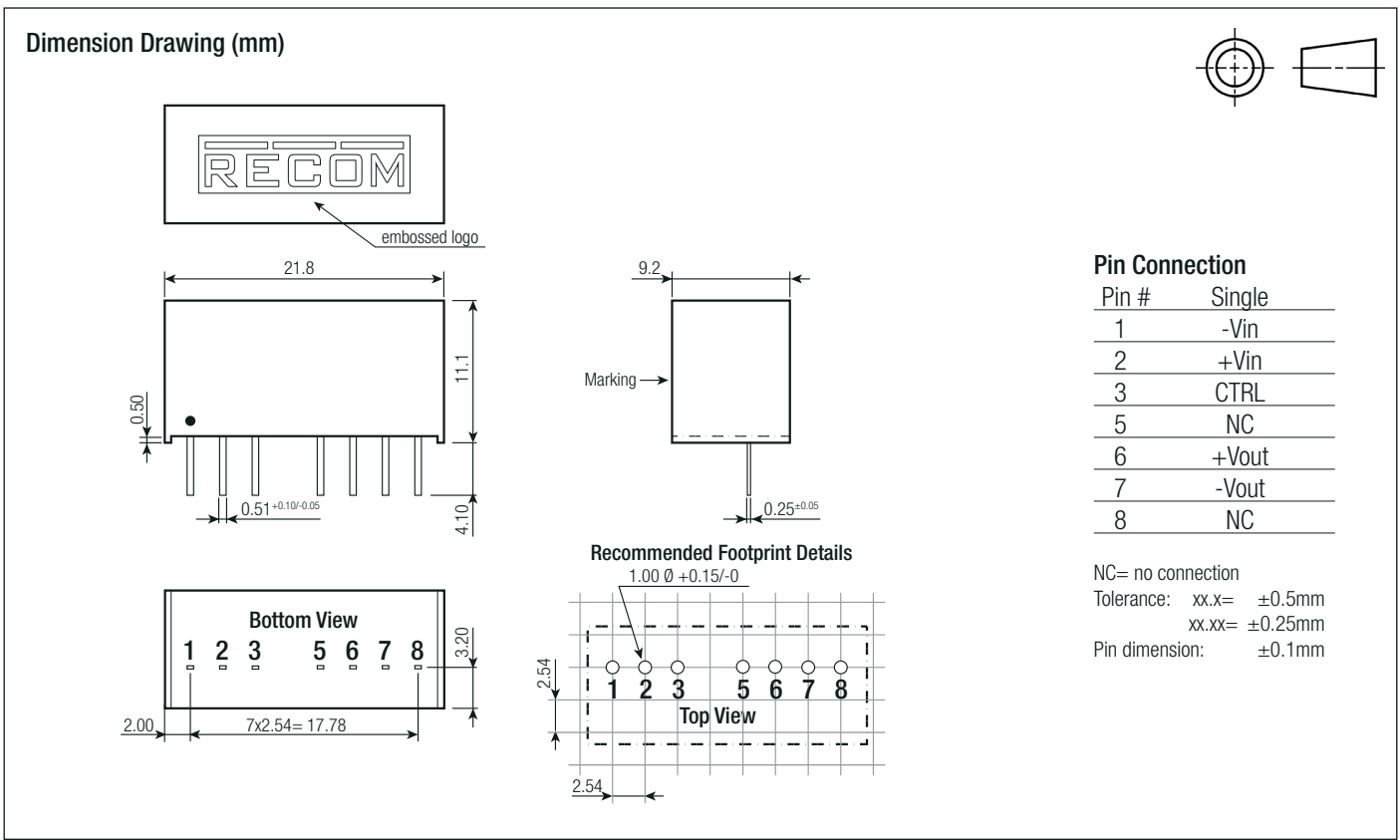
nom. Vin	C1	C2	C3	L1
5VDC	22µF/50V MLCC	22µF/50V MLCC	1000pF/3kV	0.45mH CMC
24VDC				

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting PCB	non-conductive black plastic (UL94V-0) epoxy (UL94V-0) FR4 (UL94V-0)
Dimension (LxWxH)		21.8 x 9.2 x 11.1mm
Weight		4.7g typ.

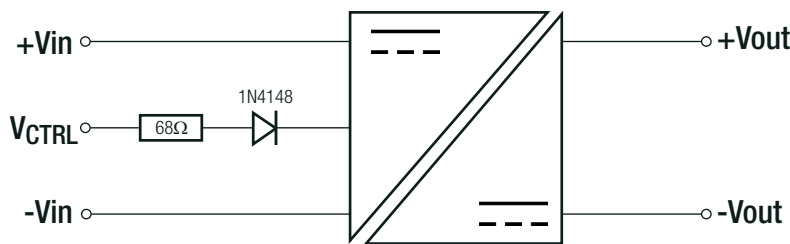
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Specifications (measured @ Ta= 25°C, nominal Vin, full load unless otherwise specified)



INSTALLATION and APPLICATION

ON/OFF CTRL Circuit



DC-DC ON: $0V < V_r < 0.8V_{DC}$
DC-DC OFF: $2V < V_r < 6V_{DC}$

PACKAGING INFORMATION

Packaging Dimension (LxWxH)	tube	520.0 x 11.2 x 18.2mm
Packaging Quantity		22pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	5% - 95% RH max.

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.