

Features

- 2:1 or 4:1 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

Regulated Converters

Description

The RSOE(-Z) 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 or 4:1 input, 2kVDC isolation and a wide operating temperature range of -40°C to +80°C without derating makes the RSOE(-Z) 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

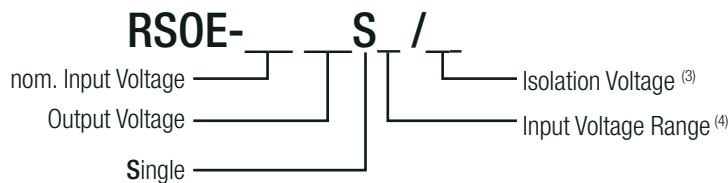
Part Number	Input Voltage Range [VDC]	Input Current @ full load [mA]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [µF]
RSOE-0505S/H2	4.5 - 9	265	5	200	76	6800
RSOE-2405S/H2	18 - 36	52	5	200	80	6800
RSOE-1205SZ/H2	4.5 - 18	105	5	200	79	6800
RSOE-2405SZ/H2	9 - 36	53	5	200	79	6800

Notes:

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

Note2: Max. cap load is tested at minimum input and full resistive load

Model Numbering



Notes:

Note3: suffix "/H2" standard isolation voltage 2kVDC/1 second

Note4: without suffix 2:1 input voltage range
with suffix "Z" 4:1 input voltage range

Ordering Examples:

RSOE-1205SZ/H2	12Vin	4:1 input voltage range	5Vout	2kVDC/1 second isolation
RSOE-0505S/H2	5Vin	2:1 input voltage range	5Vout	2kVDC/1 second isolation

RECOM

DC/DC Converter

RSOE(-Z)

1 Watt
SIP8
Single Output



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

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

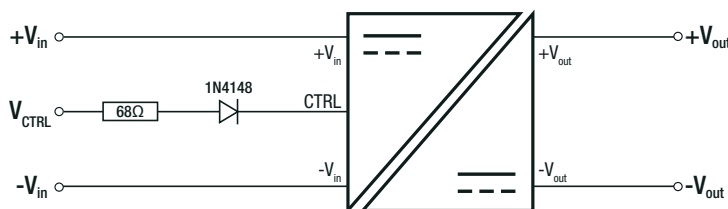
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter			capacitor		
Input Voltage Range	2:1 input	nom. Vin= 5VDC nom. Vin= 24VDC	4.5VDC 18VDC	5VDC 24VDC	9VDC 36VDC
	4:1 input (suffix "Z")	nom. Vin= 12VDC nom. Vin= 24VDC	4.5VDC 9VDC	12VDC 24VDC	18VDC 36VDC
Maximum Reverse Voltage					0VDC
Input Surge Voltage	100ms max.	nom. Vin= 5VDC nom. Vin= 12VDC nom. Vin= 24VDC		15VDC 25VDC 50VDC	
Quiescent Current	2:1 input	nom. Vin= 5VDC nom. Vin= 24VDC		40mA 3mA	
	4:1 input (suffix "Z")	nom. Vin= 12VDC nom. Vin= 24VDC		10mA 5mA	
Start-up time				500µs	3ms
Rise time				450µs	
Hold-up time				10µs	
Internal Operating Frequency	2:1 input		130kHz		
	4:1 input (suffix "Z")		250kHz		
Minimum Load ⁽⁵⁾	2:1 input		0%		
	4:1 input (suffix "Z")		10%		
Output Ripple and Noise ⁽⁶⁾	20MHz BW	2:1 input 4:1 input (suffix "Z")			75mVp-p 100mVp-p
ON/OFF CTRL	DC-DC ON DC-DC OFF		Open or 0VDC < V _{CTRL} < 0.8VDC 2VDC < V _{CTRL} < 6VDC		
Input Current of CTRL Pin	V _{CTRL} = 5VDC V _{CTRL} = 3.3VDC			15mA 10mA	
Standby Current				0.75mA	1.5mA

Notes:

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

Note6: Measurements are made with a 0.1µF MLCC across output (low ESR)

ON/OFF CTRL Circuit

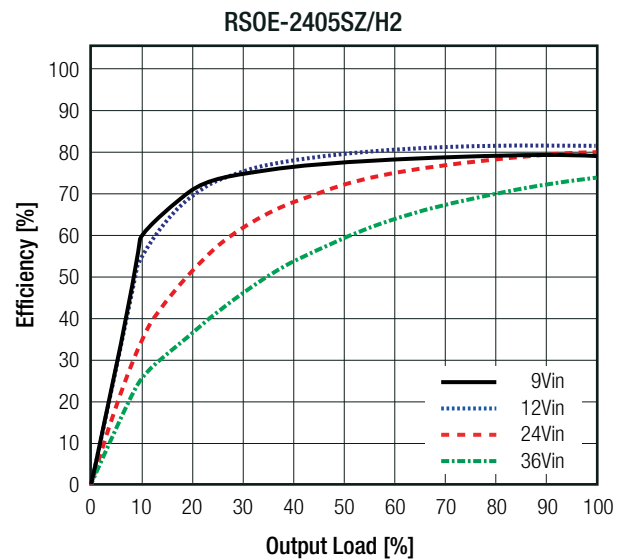
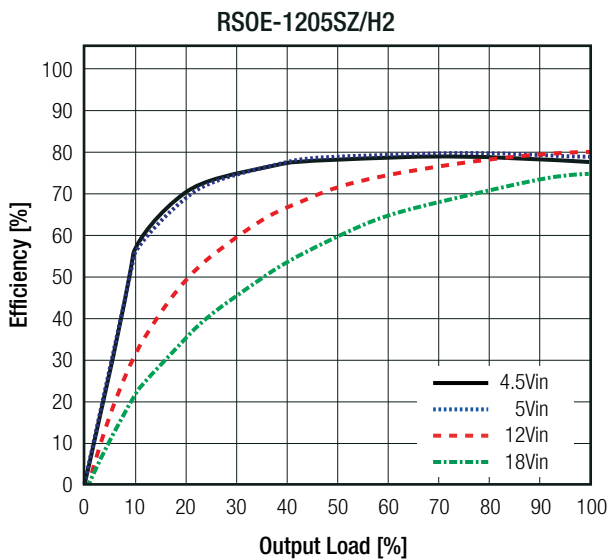
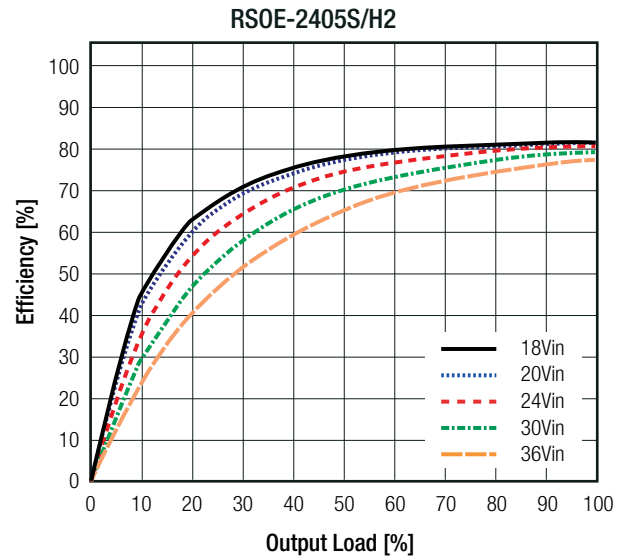
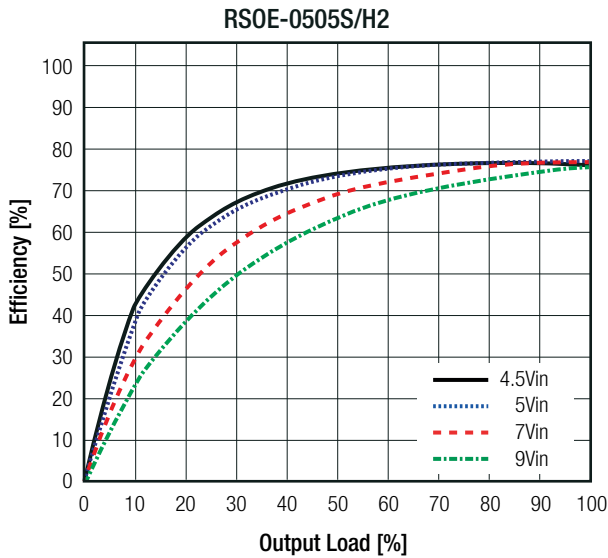


DC-DC ON: Open or 0VDC < V_{CTRL} < 0.8VDC
DC-DC OFF: 2VDC < V_{CTRL} < 6VDC

continued on next page

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

Efficiency vs. Load



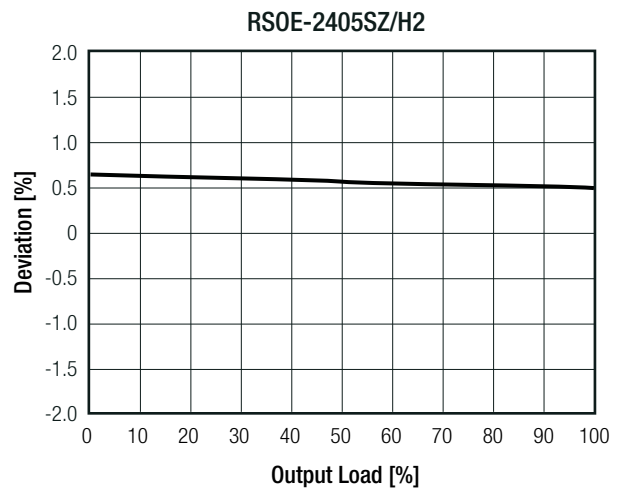
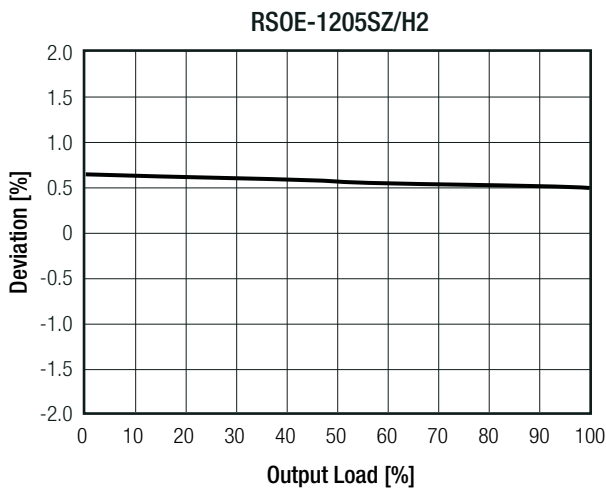
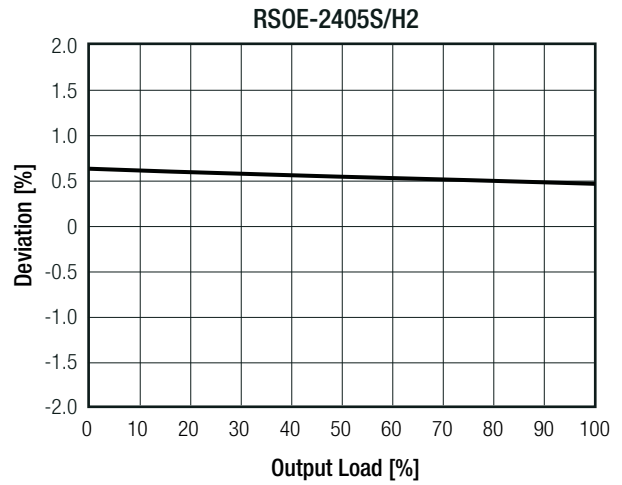
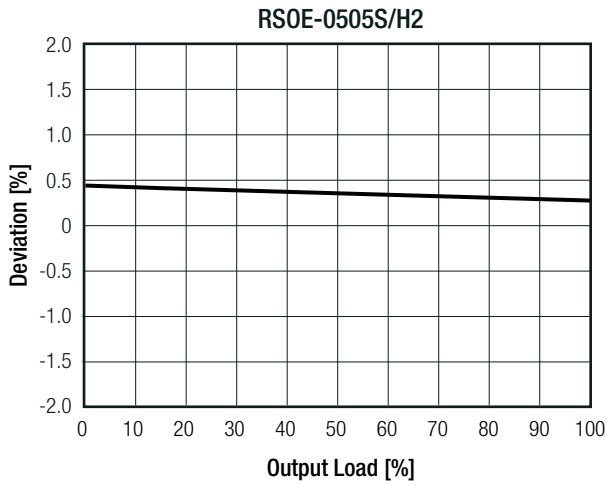
REGULATIONS

Parameter	Condition		Value
Output Accuracy			±2.0% max.
Line Regulation	low line to high line, full load	2:1 input	±0.2% max.
		4:1 input (suffix "Z")	±0.5% typ.
Load Regulation	0% to 100% load	2:1 input	0.5% max.
		4:1 input (suffix "Z")	0.5% typ.

continued on next page

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

Deviation vs. Load



PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ		continuous, auto recovery
Isolation Voltage ⁽⁷⁾	I/P to O/P	tested for 1 second	2kVDC
Isolation Resistance			1GΩ min.
Isolation Capacitance			100pF 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

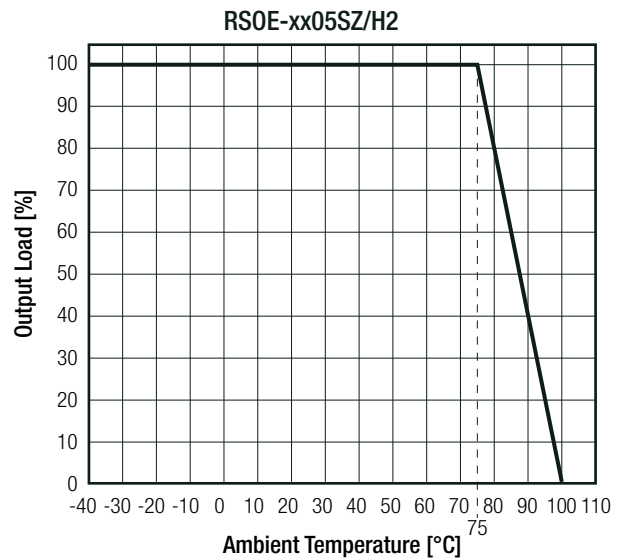
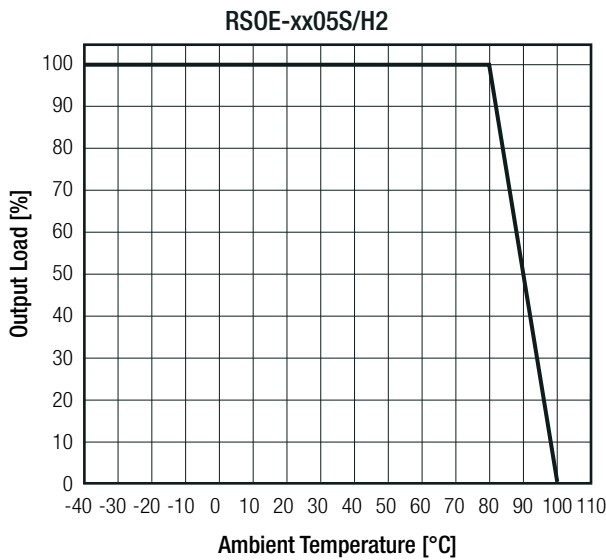
Specifications (measured @ Ta= 25°C, nominal Vin, full load unless otherwise specified)

ENVIRONMENTAL

Parameter	Condition		Value	
	without derating (refer to "Derating Graph")	2:1 input 4:1 input (suffix "Z")		
Operating Temperature Range			-40°C to +80°C -40°C to +75°C	
Maximum Case Temperature			+105°C	
Temperature Coefficient			±0.05%/K	
Operating Altitude			5000m	
Operating Humidity	non-condensing		5% - 95% RH max.	
Pollution Degree			PD2	
Vibration			MIL-STD-202G	
MTBF	according to MIL-HDBK-217F, G.B.	2:1 input	+25°C +80°C	3073 x 10 ³ hours 845 x 10 ³ hours
		4:1 input (suffix "Z")	+25°C	2800 x 10 ³ hours
			+75°C	950 x 10 ³ hours

Derating Graph

(@ Chamber and natural convection 0.1 m/s)



SAFETY AND CERTIFICATIONS

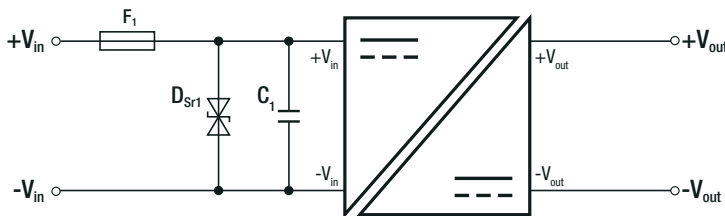
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E224736-A48	UL60950-1, 2nd Edition, 2014 CSA C22.2 No. 60950-1-07, 2nd Ed. 2014
Audio/Video, information and communication technology equipment - Safety requirements		UL62368-1, 2nd 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
RoHS2		RoHS 2011/65/EU + AM2015/863

continued on next page

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

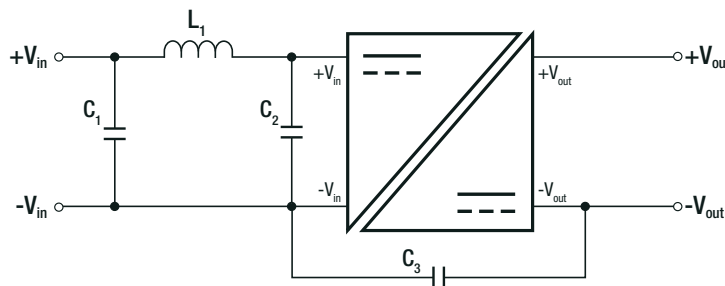
EMC Compliance	Conditions	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter (see filter suggestion below)	EN55032, Class A EN55032, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024, 2015
ESD Electrostatic discharge immunity test	±8kV Air; ±4kV Contact	IEC61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3, Criteria A
Fast Transient and Burst Immunity	DC Power Port: ±0.5kV	IEC61000-4-4, Criteria A
Surge Immunity	DC Power Port: ±0.5kV	IEC61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	DC Power Port: 3V	IEC61000-4-6, Criteria A
Power Magnetic Field	50Hz, 1A/m	IEC61000-4-8, Criteria A

Surge Protection Circuit according to IEC61000-4-5, Criteria A



Model	D _{Sr1}	C ₁
RSOE-0505S/H2	P4SMAJ11A	N/A
RSOE-2405S/H2	P4SMAJ18A	220µF/100V
RSOE-1205SZ/H2	P4SMAJ36A	470µF/100V
RSOE-2405SZ/H2	P4SMAJ36A	470µF/100V

EMC Filtering Suggestions for EN55032

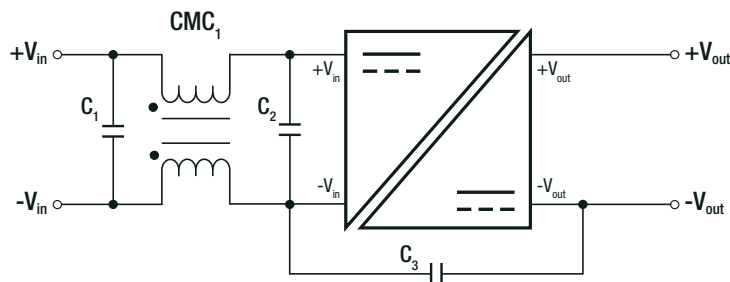


Component List Class A

Model	C1	C2	C3	L1
RSOE-0505S/H2	22µF/50V MLCC	22µF/50V MLCC	N/A	3µH choke
RSOE-2405S/H2				

Component List Class A

Model	C1	C2	C3	L1
RSOE-1205SZ/H2	22µF/50V MLCC	22µF/50V MLCC	150pF/3kV	3µH choke
RSOE-2405SZ/H2				



Component List Class B

Model	C1	C2	C3	CMC1
RSOE-0505S/H2	22µF/50V MLCC	22µF/50V MLCC	1000pF/3kV	0.45mH CMC
RSOE-2405S/H2				

Component List Class B

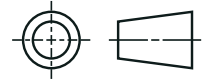
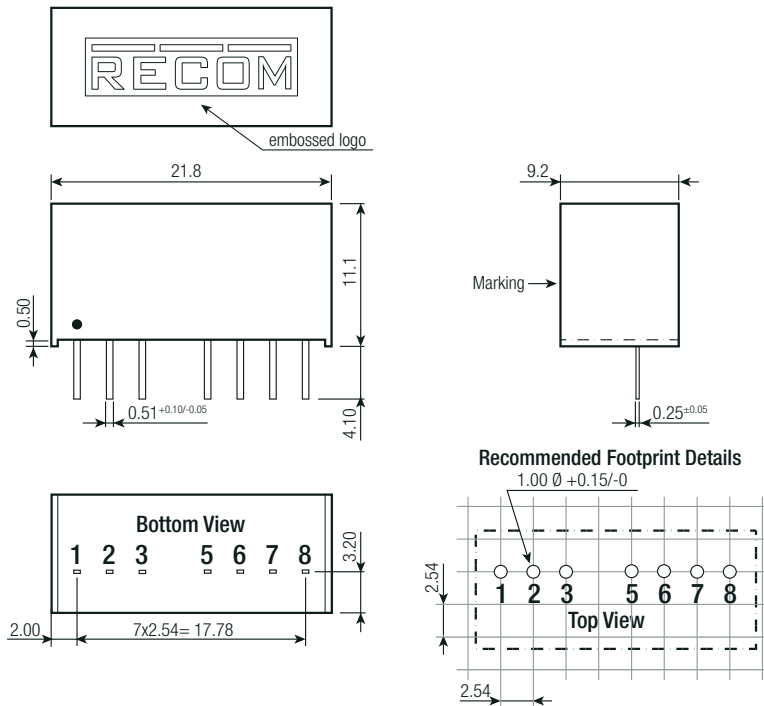
Model	C1	C2	C3	CMC1
RSOE-1205SZ/H2	22µF/50V MLCC	22µF/50V MLCC	1000pF/3kV	0.45mH CMC
RSOE-2405SZ/H2				

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

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.

Dimension Drawing (mm)



Pinning Information

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

NC= no connection
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[RECOM:](#)

[RSOE-1205SZ/H2](#) [RSOE-2405SZ/H2](#)