Features

Regulated Converters

- 2W power in compact SMD package
- Operating temperature from -40°C to +85°C with no derating
- 2kVDC or 3kVDC/1minute isolation voltage
- IEC/EN 62368-1 (pending)
- UL/CSA/CAN 62368-1 certified
- Fully protected- OCP & SCP

DC/DC Converter

RSH2

2 Watt SMD DIP14 Single Output

E224736

UL62368-1 certified
CAN/CSA-C22.2 No. 62368-1 certified
IEC/EN62368-1 (pending)
EN55032 compliant

Description

High power density 2W SMD isolated DC/DC single output converters. The RSH2 is available with three different input ranges and offers single regulated output. There is no minimum load requirement. Standard isolation is 2kVDC/1min and a /H3 version with 3kVDC/1min is available. The operating temperature is from -40°C up to +85°C without derating. The DIP14 SMD pin-out is industry standard, and the converters come equipped with ON/OFF control and, short circuit protection, and over current protection, making them ideal for highly sophisticated industrial designs. The converters are fully certified to IEC/EN/UL62368 a and are 10/10 RoHS conform.

Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. [1] [%]	max. Capacitive Load [2] [µF]
RSH2-3.33.3S [3,4]	2.8-5.5	3.3	500	76	1680
RSH2-3.305S [3,4]	2.8-5.5	5	400	78	1680
RSH2-3.312S [3,4]	2.8-5.5	12	167	80	820
RSH2-3.315S [3,4]	2.8-5.5	15	134	80	680
RSH2-3.324S [3,4]	2.8-5.5	24	83	80	470
RSH2-053.3S [3,4]	4.5-13.2	3.3	500	78	1680
RSH2-0505S [3,4]	4.5-13.2	5	400	81	1680
RSH2-0512S [3,4]	4.5-13.2	12	167	82	820
RSH2-0515S [3,4]	4.5-13.2	15	134	83	680
RSH2-0524S [3,4]	4.5-13.2	24	83	83	470
RSH2-123.3S [3,4]	9-18	3.3	500	79	1680
RSH2-1205S [3,4]	9-18	5	400	81	1680
RSH2-1212S [3,4]	9-18	12	167	82	820
RSH2-1215S [3,4]	9-18	15	134	83	680
RSH2-1224S [3,4]	9-18	24	83	83	470
RSH2-243.3S [3,4]	18-36	3.3	500	75	1680
RSH2-2405S [3,4]	18-36	5	400	81	1680
RSH2-2412S [3,4]	18-36	12	167	82	820
RSH2-2415S [3,4]	18-36	15	134	83	680
RSH2-2424S [3,4]	18-36	24	83	83	470

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

RSH2-__ __S/__ -R

- nom. Output Power
- nom. Input Voltage
- Output Voltage
- **S**ingle
- Isolation [3]
- Packaging [4]

Notes:

Note3: add suffix "/H2" for 2kVDC isolation
add suffix "/H3" for 3kVDC isolation, for more information refer to ***"Isolation Voltage (6)"***

Note4: without suffix = standard tube packaging
add suffix „-R" for tape and reel packaging for more details, refer to ***"PACKAGING INFORMATION"***

Ordering Examples:

RSH2-0505S/H2	4.5-13.2Vin	5Vout	single output	2kVDC/1sec isolation	tube packaging (25pcs)
RSH2-2405S/H2-R	18-36Vin	5Vout	single output	2kVDC/1sec isolation	Tape and Reel (150pcs)
RSH2-1212S/H3	9-18Vin	12Vout	single output	3kVDC/1sec isolation	tube packaging (25pcs)

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

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				Pi type
Input Voltage Range	nom. Vin= 3.3VDC 5VDC 12VDC 24VDC	2.8VDC 4.5VDC 9VDC 18VDC		5.5VDC 13.2VDC 18VDC 36VDC
Input Surge Voltage (100ms max.)	nom. Vin= 3.3VDC 5VDC, 12VDC 24VDC			10VDC 25VDC 50VDC
Input Current	nom. Vin= 3.3VDC 5VDC 12VDC 24VDC		0.8A 0.5A 0.2A 0.1A	
Minimum Load		0%		
ON/OFF CTRL refer to ***"ON/OFF CTRL"***	nom. Vin= 3.3VDC: DC-DC ON DC-DC OFF			open or high impedance external V_{CTRL}= 2.8VDC
	nom. Vin= 5, 12VDC: DC-DC ON DC-DC OFF			open or high impedance external V_{CTRL}= 4.5VDC + 1N4148
	nom. Vin= 24VDC: DC-DC ON DC-DC OFF			open or high impedance external V_{CTRL}= 4.5VDC + 68Ω resistor
Internal Operating Frequency			200kHz	
Output Ripple and Noise [5]	20MHz BW			50mVp-p

Notes:

Note5: Measurements are made with a 0.1µF MLCC across output. (low ESR)

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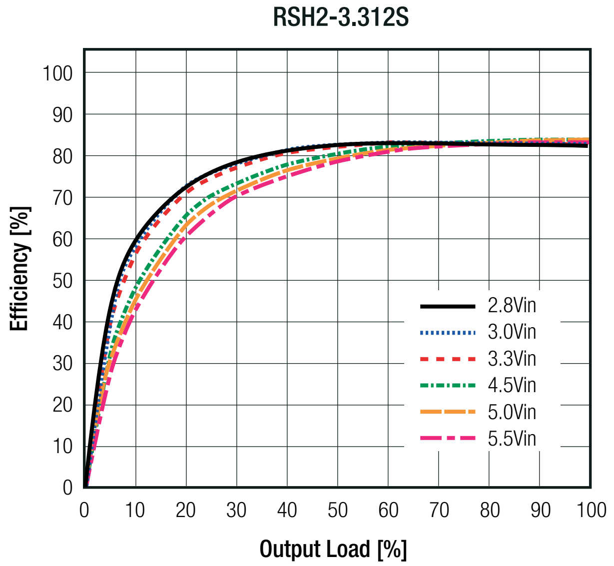
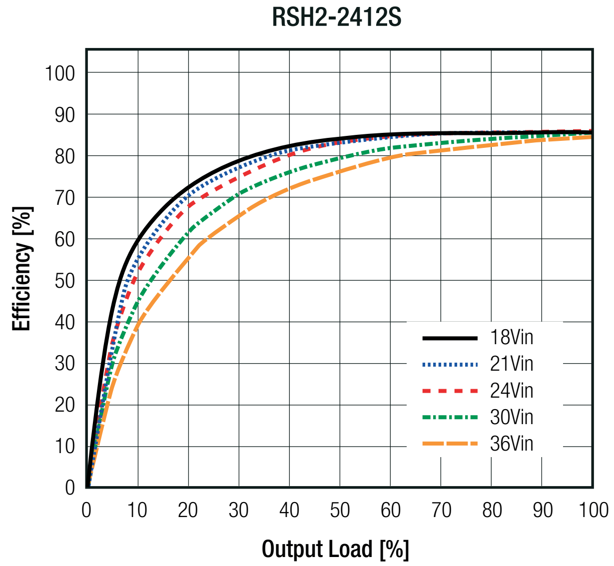
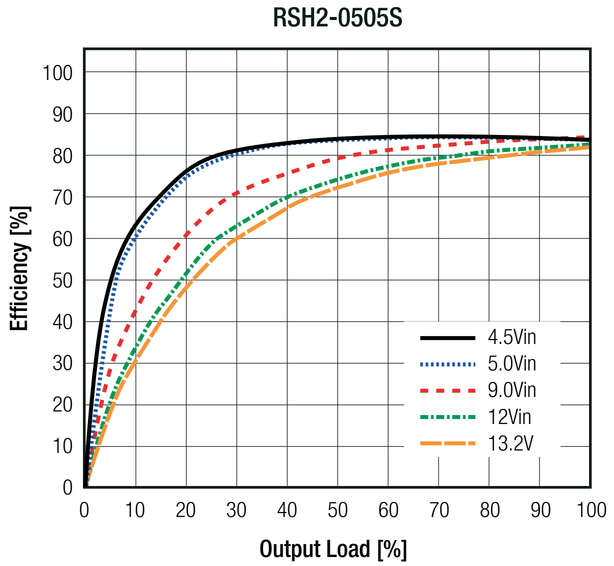
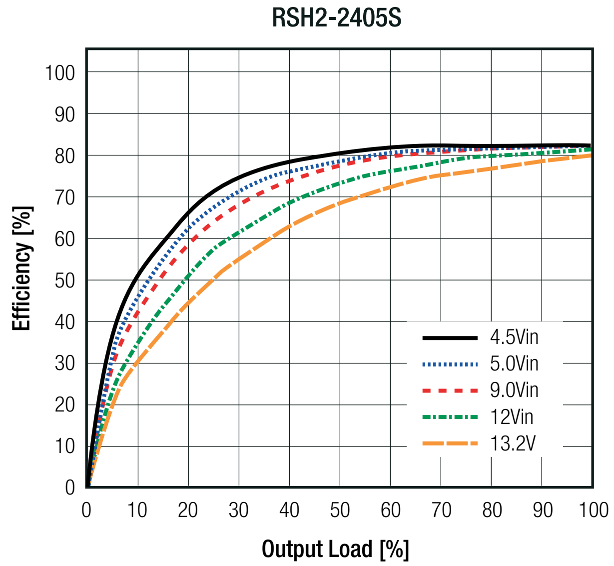
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Efficiency vs. Load

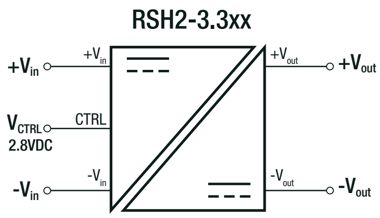


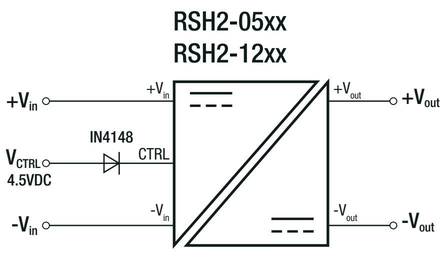


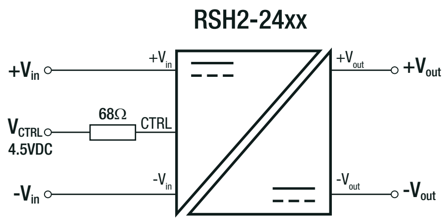




ON/OFF CTRL



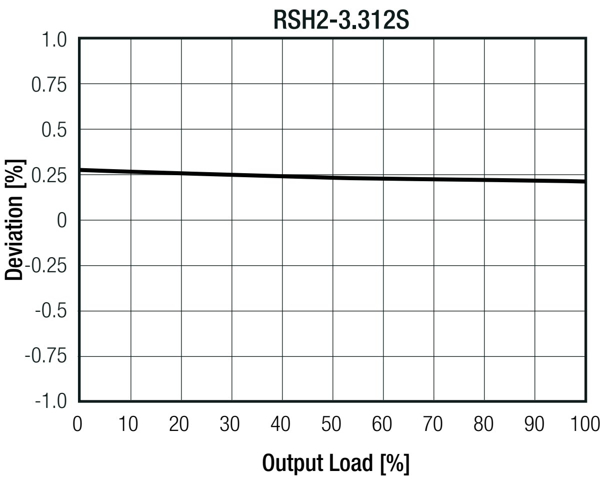


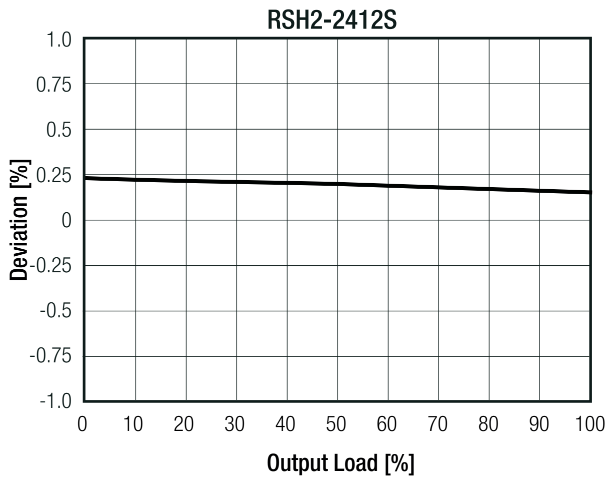


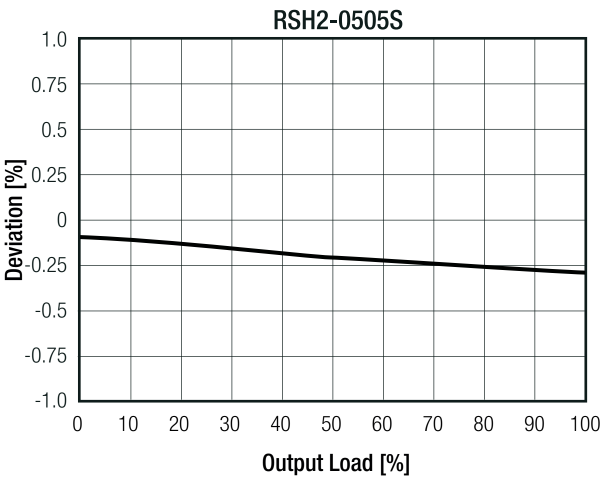
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

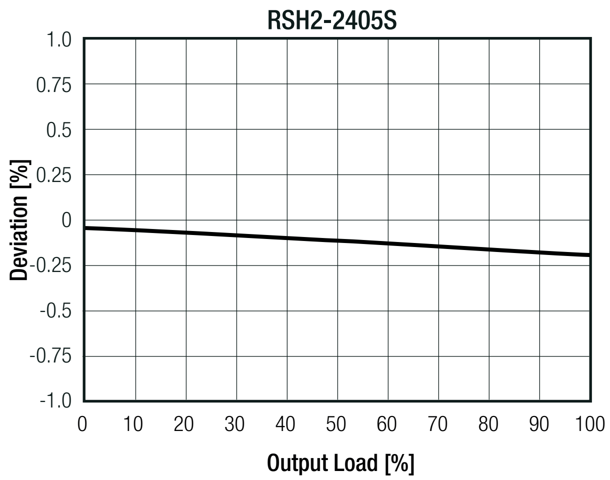
REGULATIONS		
Parameter	**Condition**	**Value**
Output Accuracy		±1.0% max.
Line Regulation	low line to high line, full load	±0.2% max.
Load Regulation	20% to 100% load	0.5% max.

Deviation vs. Load









PROTECTIONS				
Parameter	**Type**			**Value**
Short Circuit Protection (SCP)	below 100mΩ			continuous, auto recovery
Over Current Protection (OCP)				160% typ., hiccup mode
Isolation Voltage [(6)]	I/P to O/P	tested for 1 minute	with suffix "H2"	2kVDC 500VAC
			with suffix "H3"	3kVDC 1kVAC
Isolation Resistance				1GΩ typ.
Isolation Capacitance				50pF typ.

Notes:

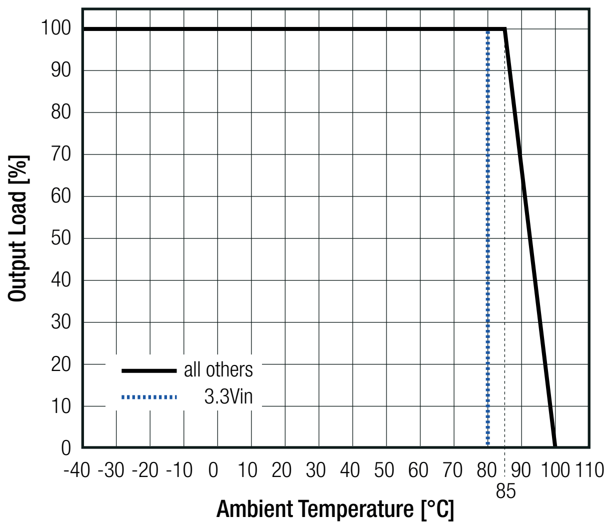
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

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

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

ENVIRONMENTAL			
Parameter	**Condition**		**Value**
Operating Temperature Range	@ natural convection 0.1m/s	with derating	-40°C to +100°C
Maximum Case Temperature			105°C
Temperature Coefficient			±0.05%/K
Operating Altitude			5000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
Vibration			MIL-STD-202G
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +80°C	4140 x 10^3 hours 1206 x 10^3 hours

Derating Graph
(@ Chamber and natural convection 0.1m/s)



SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**File Number**	**Standard**
Audio/Video, information and communication technology equipment - Part1: Safety requirements	E224736-A6025-UL	UL62368-1:2014 CAN/CSA-C22.2 No. 62368-1:2014
Audio/Video, information and communication technology equipment - Part1: Safety requirements	pending	IEC62368-1:2014 2nd Edition EN62368-1:2014 + A11:2017
RoHS2		RoHS 2011/65/EU + AM2015/863
EMC Compliance	**Condition**	**Standard / Criterion**
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter refer to (***"EMC Filtering"***)	EN55032
Electromagnetic compatibility of multimedia equipment - Immunity requirements		EN55035
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024
ESD Electrostatic Discharge Immunity Test		IEC/EN61000-4-2
Radiated, Radio-Frequency, Electromagnetic Field Immunity Test		IEC/EN61000-4-3
Fast Transient and Burst Immunity		IEC/EN61000-4-4
Surge Immunity		IEC/EN61000-4-5
Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields		IEC/EN61000-4-6

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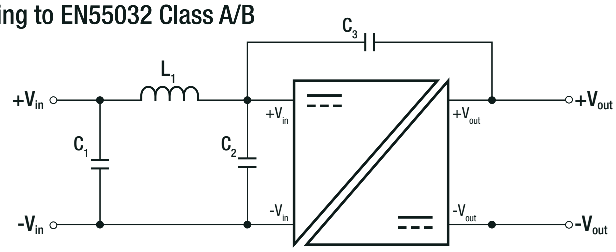
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

EMC Filtering Suggestions according to EN55032 Class A/B



Component List Class A

MODEL	C1	C2	C3	L1
RSH2-3.312S/SMD	10µF	N/A	N/A	3.9µH
RSH2-0505S/SMD				
RSH2-2405S/SMD				
RSH2-2412S/SMD				

Component List Class B

MODEL	C1	C2	C3	L1
RSH2-3.312S/SMD	10µF	10µF	1nF	3.9µH
RSH2-0505S/SMD				
RSH2-2405S/SMD				
RSH2-2412S/SMD				

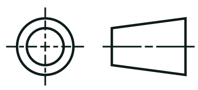
Notes:

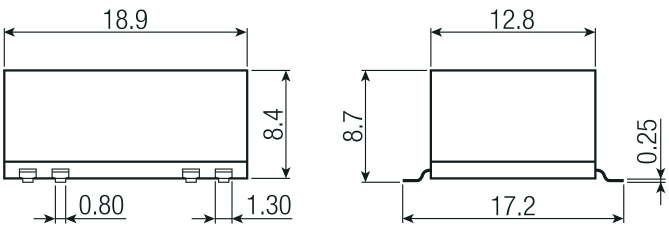
Note8: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact RECOM tech support for advice

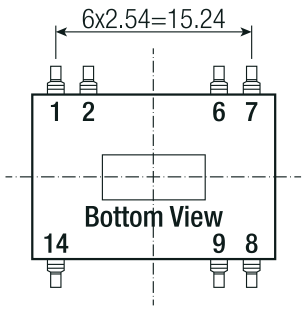
DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case & base	non-conductive black plastic
Dimension (LxWxH)		18.9 x 17.2 x 8.7mm
Weight		2.5g typ.

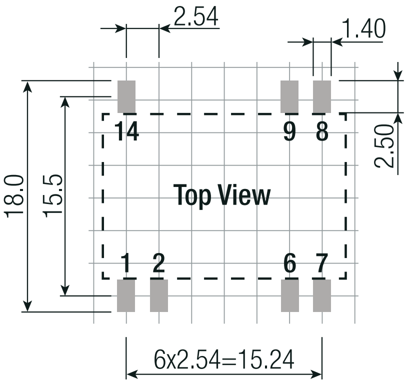
Dimension Drawing (mm)







Recommended Footprint Details



Pinning Information

Pin #	Single
1	-Vin
2	CTRL
6	NC
7	NC
8	+Vout
9	-Vout
14	+Vin

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

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

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube tape and reel (carton) reel (diameter + width)	520.0 x 22.20 x 11.80mm 385.0 x 375.0 70.0mm Ø330.0 x 44.0mm
Packaging Quantity	tube tape and reel	25pcs 150pcs
Tape Width		44mm
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.