Features

Unregulated Converters

- 0.5W SMD package
- Efficiency up to 80%
- Optional continuous SCP
- 1kVDC/1s and 3kVDC/1s isolation option
- Operating temperature from -40°C to +100°C at full load

RECOM
DC/DC Converter

R0.5S & R0.5D

0.5 Watt SMD Single and Dual Output

3 YEAR warranty

Description

The R0.5S and R0.5D converters are of the enclosed open frame type, i.e. they are not potted. The converters are typically used in general purpose and industrial low power isolation and voltage matching applications where a SMD converter is required. The converter series feature an extended ambient temperature operating range of -40°C to +100°C without derating and optional continuous short circuit protection. In addition to single and dual outputs, the converters are also available prepackaged as tape and reel for use with automatic insertion machines.

Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ.(1) [%]	max. Capacitive Load(2) [µF]
R0.5S (3)-3.305 (4,5)	3.3	5	100	80	1000
R0.5S (3)-3.312 (4,5)	3.3	12	42	77	150
R0.5S (3)-3.315 (4,5)	3.3	15	33	77	150
R0.5S (3)-0505 (4,5)	5	5	100	72	1000
R0.5S (3)-0512 (4,5)	5	12	42	77	150
R0.5S (3)-0515 (4,5)	5	15	33	79	150
R0.5S (3)-1205 (4,5)	12	5	100	74	1000
R0.5S (3)-1212 (4,5)	12	12	42	75	150
R0.5S (3)-1215 (4,5)	12	15	33	75	150
R0.5S (3)-2405 (4,5)	24	5	100	75	1000
R0.5S (3)-2412 (4,5)	24	12	42	77	150
R0.5S (3)-2415 (4,5)	24	15	33	77	150
R0.5D (3)-3.305 (4,5)	3.3	±5	±50	79	±470
R0.5D (3)-3.312 (4,5)	3.3	±12	±21	76	±68
R0.5D (3)-3.315 (4,5)	3.3	±15	±17	77	±68
R0.5D (3)-0505 (4,5)	5	±5	±50	79	±470
R0.5D (3)-0512 (4,5)	5	±12	±21	77	±68
R0.5D (3)-0515 (4,5)	5	±15	±17	79	±68
R0.5D (3)-1205 (4,5)	12	±5	±50	76	±470
R0.5D (3)-1212 (4,5)	12	±12	±21	75	±68
R0.5D (3)-1215 (4,5)	12	±15	±17	75	±68
R0.5D (3)-2405 (4,5)	24	±5	±50	77	±470
R0.5D (3)-2412 (4,5)	24	±12	±21	75	±68
R0.5D (3)-2415 (4,5)	24	±15	±17	75	±68







RoHS 2+ compliant 10 from 10 — RECOM CONVERTERS COMPLIANT PRODUCTS

REACH compliant — RECOM CONVERTERS COMPLIANT PRODUCTS

c UL us E358085

EAC

IECEE CB SCHEME

UL60950-1 certified
CAN/CSA-C22.2 No. 60950-1-07 certified
IEC60950-1 certified
EN55032 compliant
CB report

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

R0.5S & R0.5D Series

Model Numbering



Notes:

Note3: R0.5S: 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)
with marking "12" denotes 10 pins out of 12 fitted (includes /H option)
R0.5D: without marking denotes "6" pins out of 10 fitted (includes /H option)
with marking "10" denotes 10 pins out of 10 fitted (/H option not available)
with marking "12" denotes 10 pins out of 12 fitted (includes /H option)

Note4: standard part is without continuous short circuit protection
add suffix „/P" for continuous short circuit protection
add suffix „/H" for 3kVDC isolation (not available for R0.5S8 and R0.5D10)
or add suffix „/HP" for 3kVDC isolation and continuous short circuit protection

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

Ordering Examples:

R0.5S12-2405/P = Single Output, 10 pins out of 12 fitted, 24Vin, 5Vout with continuous short circuit protection
R0.5D10-0505-R = Dual Output, 10 pins fitted, 5Vin, 5Vout, tape and reel packaging
R0.5D-0505/HP = Dual Output, 5 pins out of 8 fitted, 5Vin, 5Vout with 3kVDC/1s isolation and continuous short circuit protection

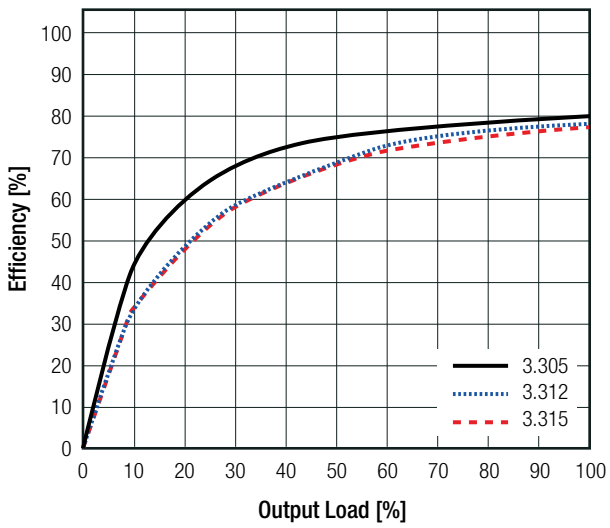
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

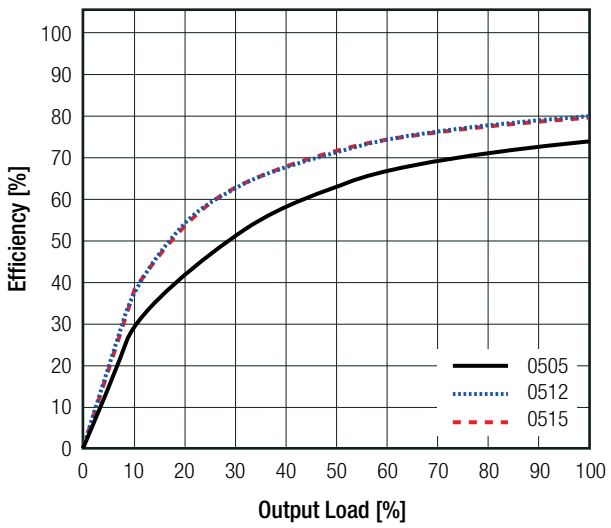
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load		0%		
Internal Operating Frequency		20kHz	50kHz	90kHz
Output Ripple and Noise	20MHz BW		50mVp-p	100mVp-p

Efficiency vs. Load

R0.5S-3.3xx



R0.5S-05xx

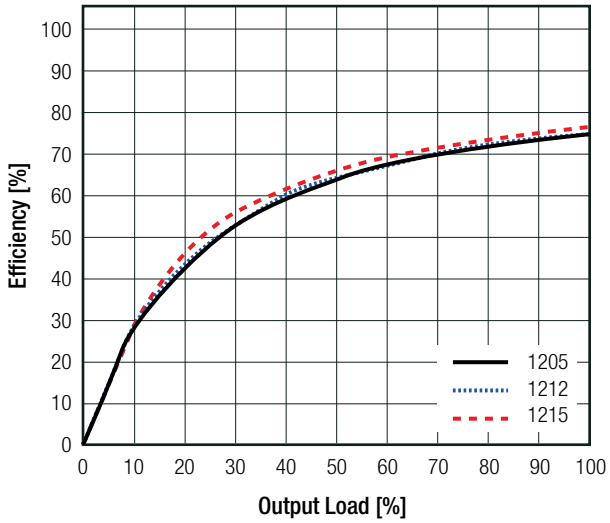


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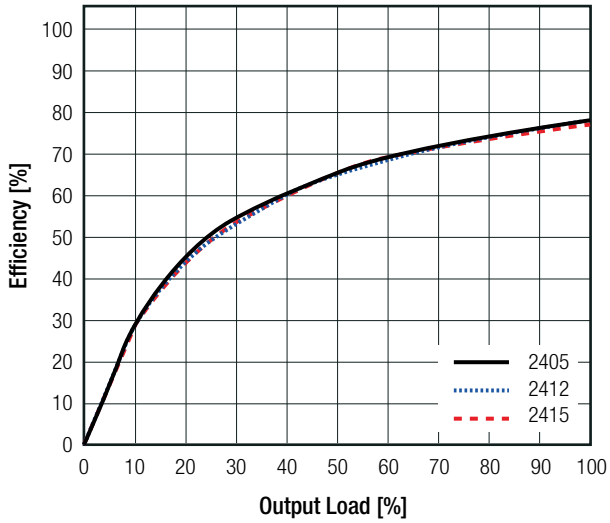
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Efficiency vs. Load

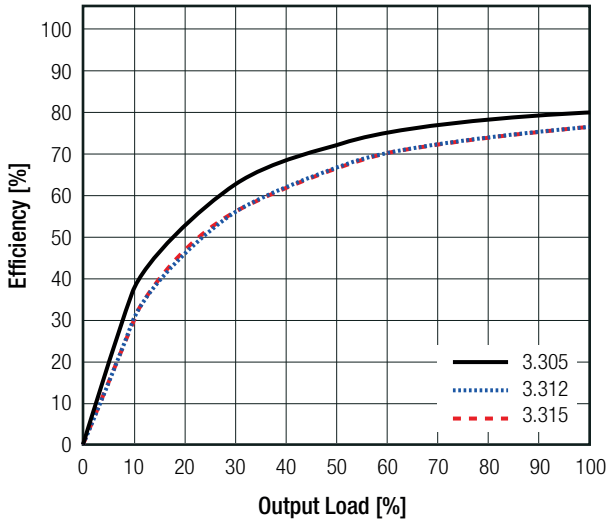
R0.5S-12xx



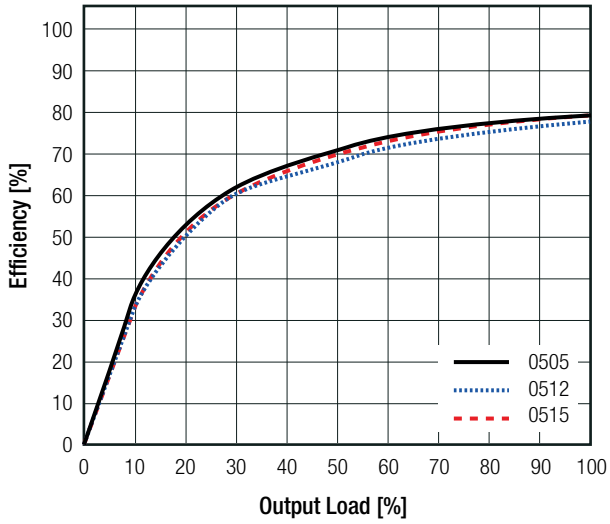
R0.5S-24xx



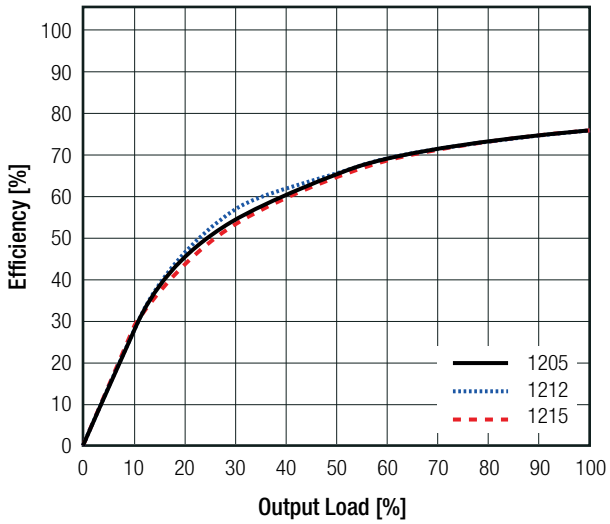
R0.5D-3.3xx



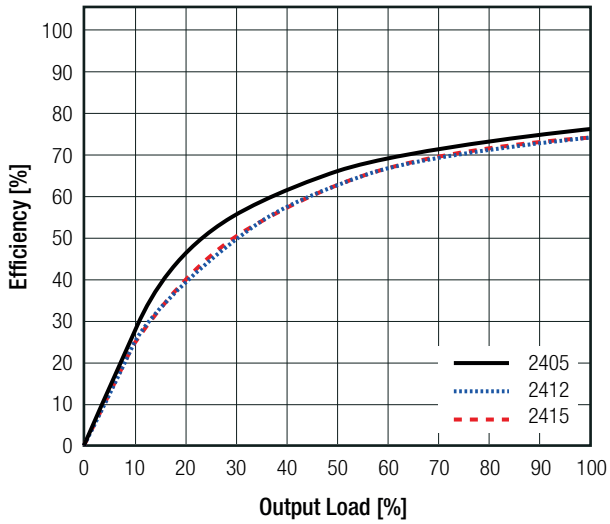
R0.5D-05xx



R0.5D-12xx



R0.5D-24xx



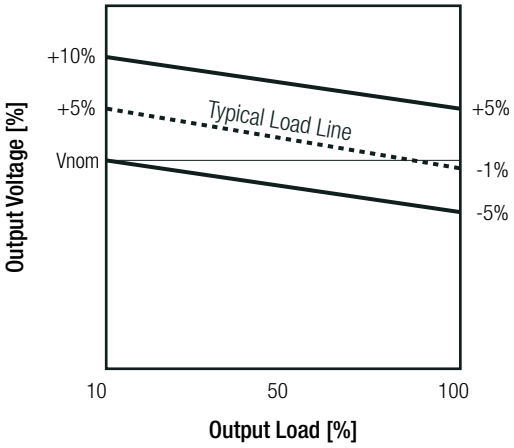
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

REGULATIONS			
Parameter	**Condition**		**Value**
Output Accuracy			±1.0% typ. / ±5.0% max.
Line Regulation	low line to high line, full load		1.2% typ.
Load Regulation [6]	10% to 100% load	5Vout 12, 15Vout	6.0% typ. / 15.0% max. 5.0% typ. / 10.0% max.

Notes:

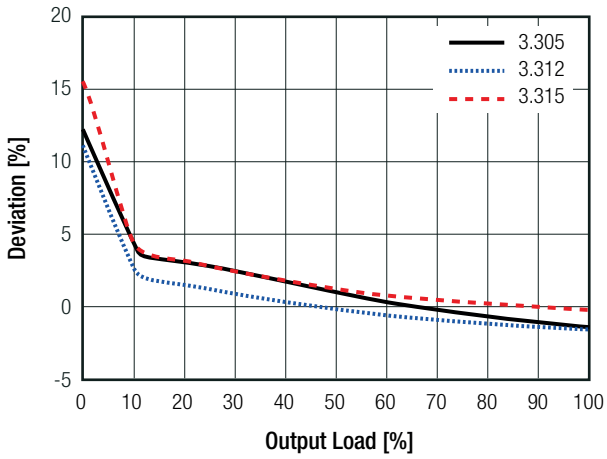
Note6: Operation below 10% load will not harm the converter, but specifications may not be met

Tolerance Envelope

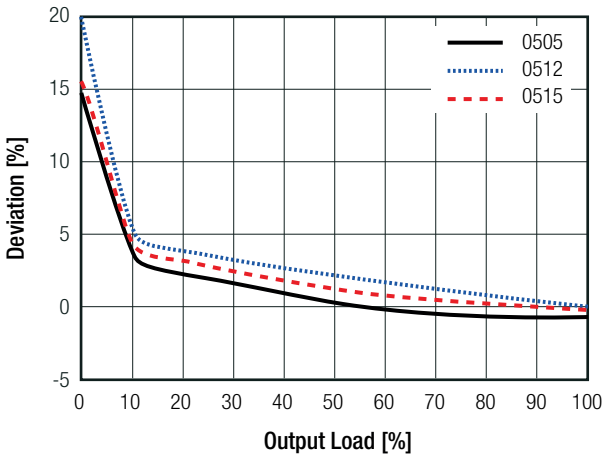


Deviation vs. Load

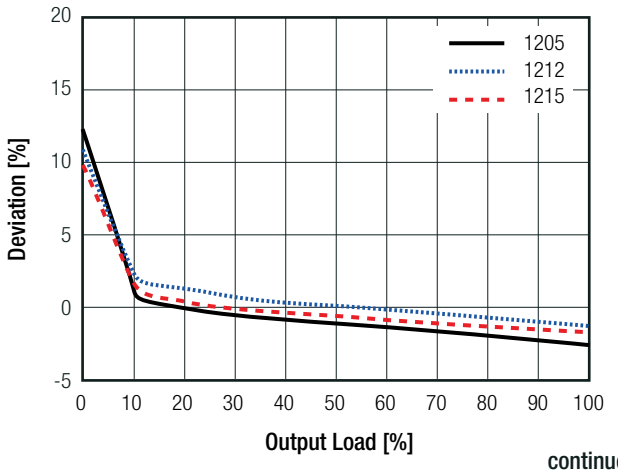
R0.5S-3.3xx



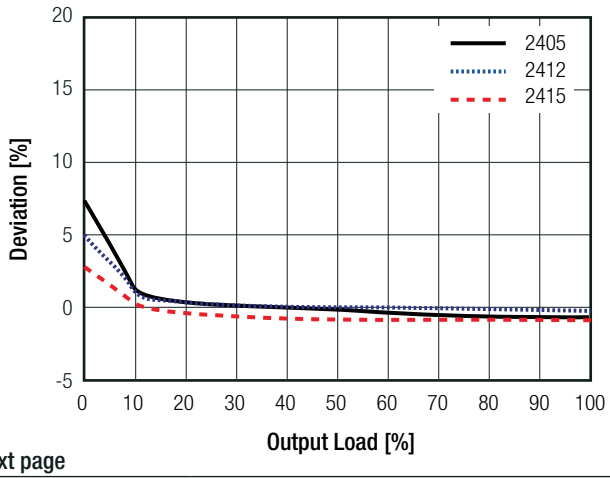
R0.5S-05xx



R0.5S-12xx



R0.5S-24xx

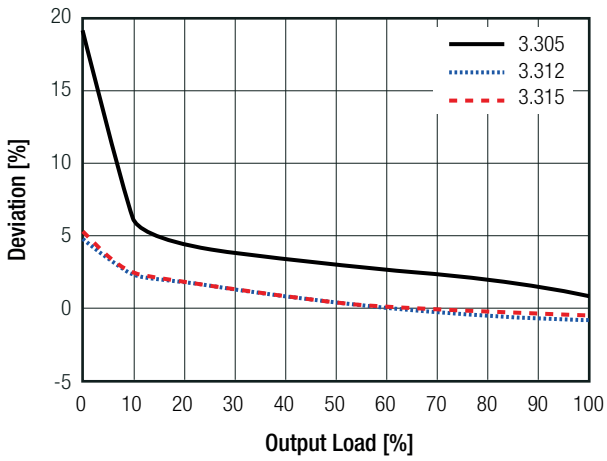


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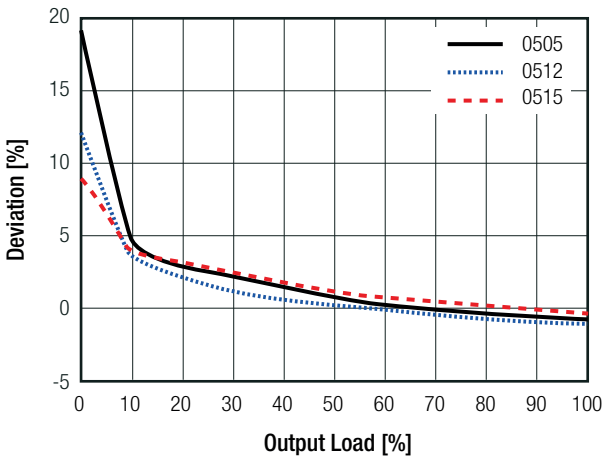
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Deviation vs. Load

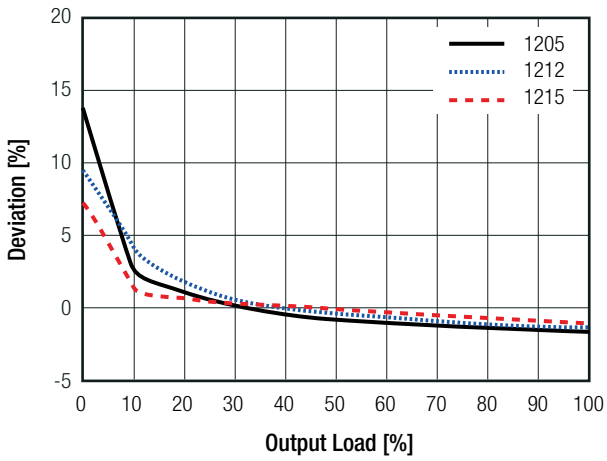
R0.5D-3.3xx



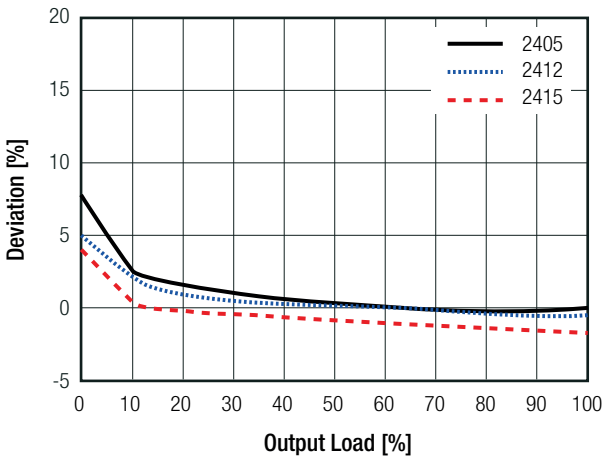
R0.5D-05xx



R0.5D-12xx



R0.5D-24xx



PROTECTIONS

Parameter	Type			Value
Short Circuit Protection (SCP)	below 100mΩ	standard part with suffix "/P"		1 second continuous
Isolation Voltage (7)	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	3kVDC 1.5kVAC/60Hz
Isolation Resistance	Viso=500V			10GΩ min.
Isolation Capacitance				75pF max.
Insulation Grade	according to 60950-1			functional

Notes:

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

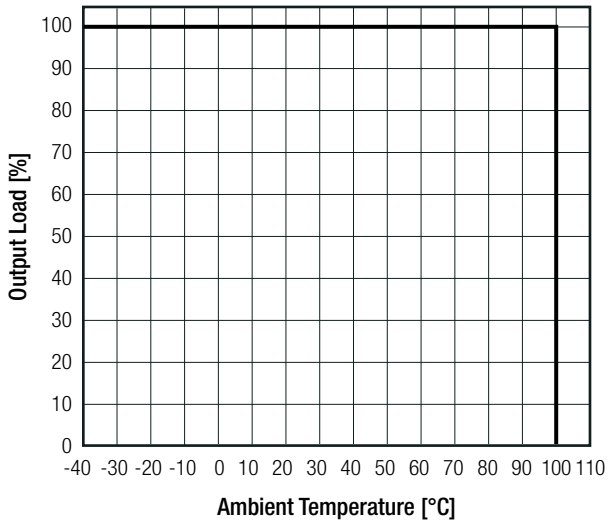
Note8: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

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

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection		-40°C to +100°C
Operating Altitude	according to 60950-1		2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +100°C	3962 x 10^3 hours 1003 x 10^3 hours

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 (CB Scheme)	E322406-A2-CB-1	IEC60950-1:2001, 1st Edition
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS2		RoHS-2011/65/EU + AM-2015/863

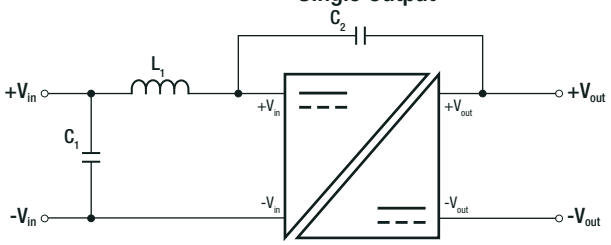
EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter refer to **"EMC Filtering"**	EN55032, Class B

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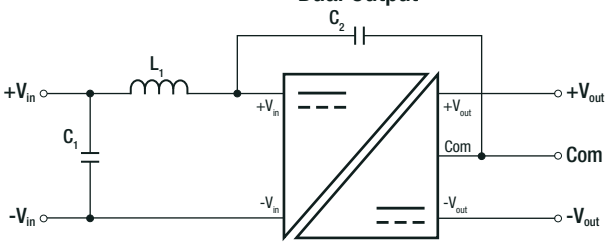
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

EMC Filtering Suggestions according to EN55032 Class B

Single Output



Dual Output



Component List Single

nom. Vin	C1	C2	L1
3.3, 5, 12VDC	4.7µF MLCC	470pF/4kVDC	4.7µH SMD Inductor
15VDC	2.2µF MLCC		4.7µH SMD Inductor

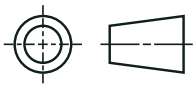
Component List Dual

nom. Vin	C1	C2	L1
3.3VDC	4.7µF MLCC	470pF/4kVDC	10µH SMD Inductor
5VDC			4.7µH SMD Inductor
12, 15VDC			2.2µH SMD Inductor

DIMENSION AND PHYSICAL CHARACTERISTICS

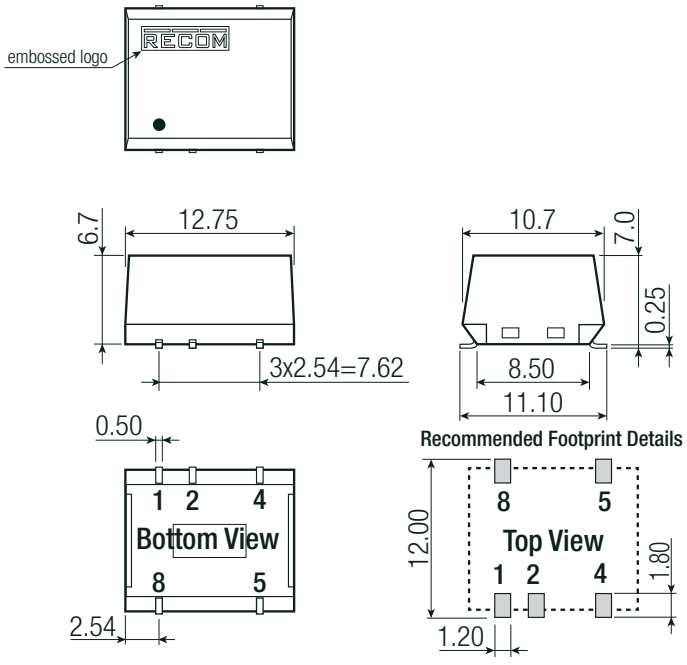
Parameter	Type	Value
Material	case	non-conductive black plastic, (UL94 V-0)
Dimension (LxWxH)	R0.5S, R0.5S8	12.75 x 10.7 x 7.0mm
	R0.5S12, R0.5D, R0.5D10, R0.5D12	15.24 x 10.7 x 7.0mm
Weight	R0.5S	1.0g typ.
	R0.5S8	1.1g typ.
	R0.5S12, R0.5D, R0.5D10, R0.5D12	1.2g typ.

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: ±0.25mm

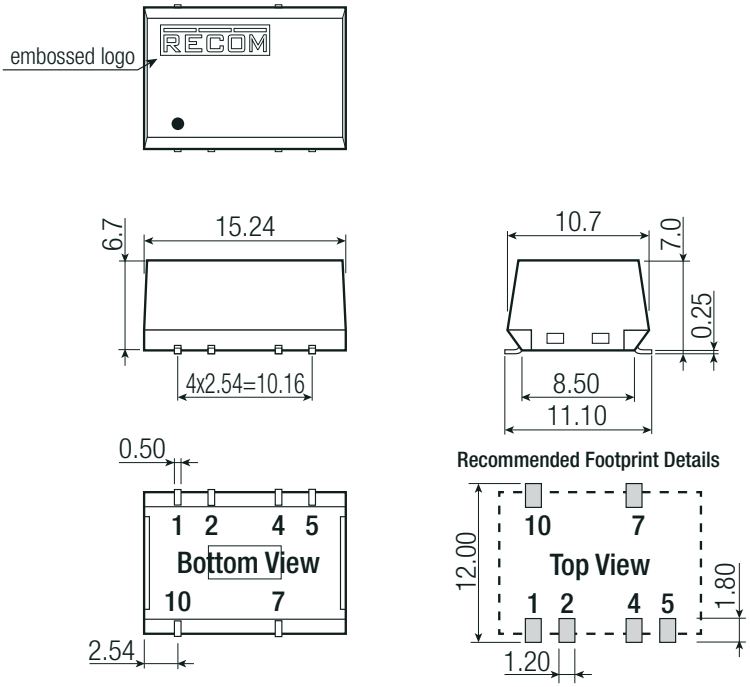
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Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)

6 Pin Dual SMD Package

/H option is available in this pin package



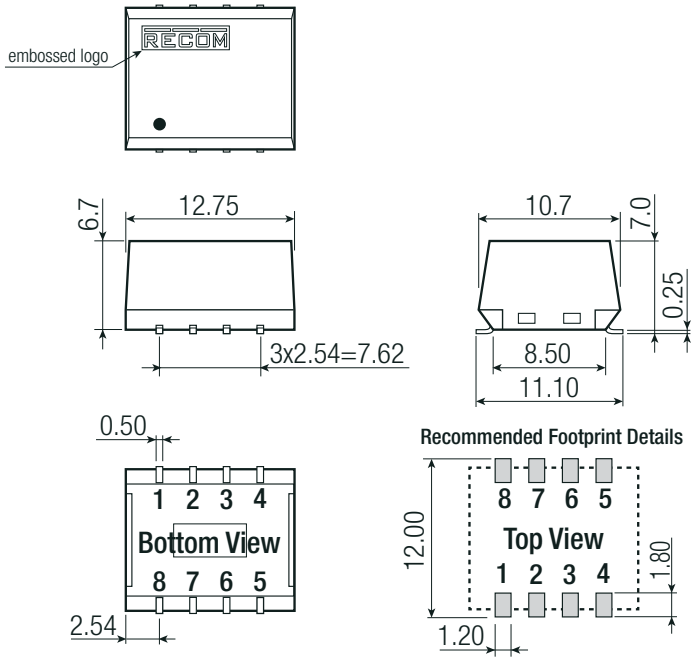
Pinning Information

Pin #	Dual
1	-Vin
2	+Vin
4	Com
5	-Vout
7	+Vout
10	NC

NC = No Connection
Tolerance: ±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, 7, 8	NC

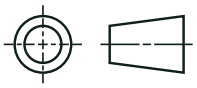
NC = No Connection
Tolerance: ±0.25mm

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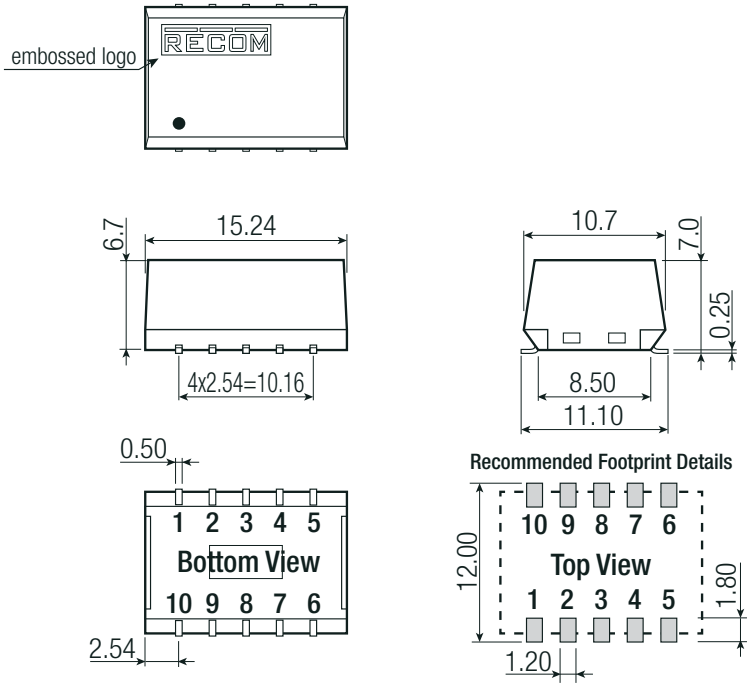
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)

10 Pin Dual SMD Package



/H option is not available in this pin package



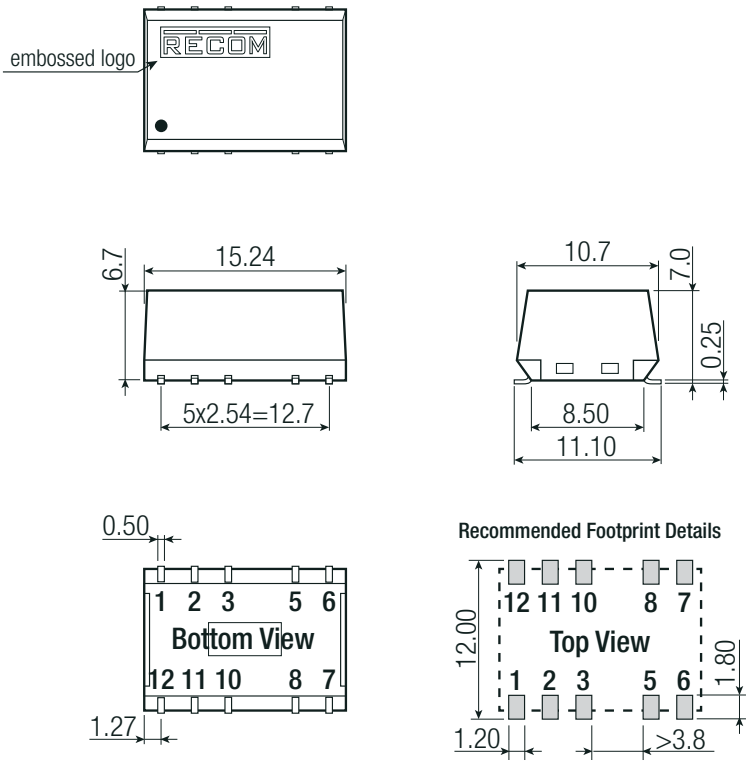
Pinning Information

Pin #	Dual
1	-Vin
2	+Vin
3	NC
4	Com
5	-Vout
6	NC
7	+Vout
8, 9, 10	NC

NC = No Connection
Tolerance: ±0.25mm

12 Pin Single and Dual SMD Package

/H option is available in this pin package



Pinning Information

Pin #	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	NC	NC
5	-Vout	Com
6	NC	-Vout
7	NC	NC
8	+Vout	+Vout
10, 11, 12	NC	NC

NC = No Connection
Tolerance: ±0.25mm

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

PACKAGING INFORMATION			
Packaging Dimension (LxWxH)	tube tape and reel (carton)		530.0 x 17.0 x 14.0mm 355.0 x 342.0 x 36.0mm
Packaging Quantity	tube	R0.5S, R0.5S8 R0.5S12, R0.5D, R0.5D10, R0.5D12	40pcs 33pcs
	tape and reel		500pcs
Tape Width			24mm
Storage Temperature Range			-55°C to +125°C
Storage Humidity	non-condensing		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.