Features

Unregulated Converters

- 2 Watt power supply in SMD package
- -40°C to +100°C operating temperature
- 3kVDC/1 second or 1kVDC/1 second isolation
- No minimum load required
- IEC/EN/UL62368-1 certified, CB Report

RECOM
DC/DC Converter

R2SX

2 Watt SMD Single Output

Description

The R2SX is a low profile, open-frame 2W SMD isolated DC/DC converter with either 3kVDC/1 second isolation (/H version) or 1kVDC/1 second isolation options. There is no minimum load requirement and the efficiency stays high over a wide 20% to 100% load range. The operating temperature is from -40°C up to +75°C at full load, and up to +100°C with derating. The converters are fully certified to IEC/EN/UL62368-1 and are 10/10 RoHS-conform. A simple low cost LC filter is all that is needed for Class B EMC compliance. The R2SX comes with a 3-year warranty.

Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
R2SX-053.3	5	3.3	606	79	3300
R2SX-0505	5	5	400	81	3300
R2SX-1205	12	5	400	84	3300
R2SX-2405	24	5	400	85	3300
R2SX-2415	24	15	133	85	680
R2SX-2424	24	24	84	86	220

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

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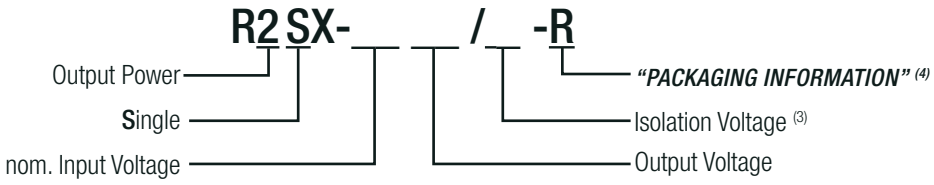
E224736

UL62368-1 certified
CAN/CSA-C22.2 No. 62368-1-14 certified
UL60950-1 certified
CAN/CSA-C22.2 No. 60950-1-07 certified
IEC/EN62368-1 certified
EN55032 compliant
EN55024 compliant
CB report

Model Numbering



Notes:

Note3: without suffix, standard isolation voltage (1kVDC/1 second)
with suffix „/H", high isolation voltage (3kVDC/1 second)

Note4: with suffix „-R", standard packaging tape and reel
with suffix „-Tray" for optional tray packaging

Ordering Examples:

R2SX-0505-R	5Vin	5Vout	Single Output	1kVDC/1 second isolation	tape and reel packaging
R2SX-2424/H-R	24Vin	24Vout	Single Output	3kVDC/1 second isolation	tape and reel packaging
R2SX-2424/H-Tray	24Vin	24Vout	Single Output	3kVDC/1 second isolation	tray packaging

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

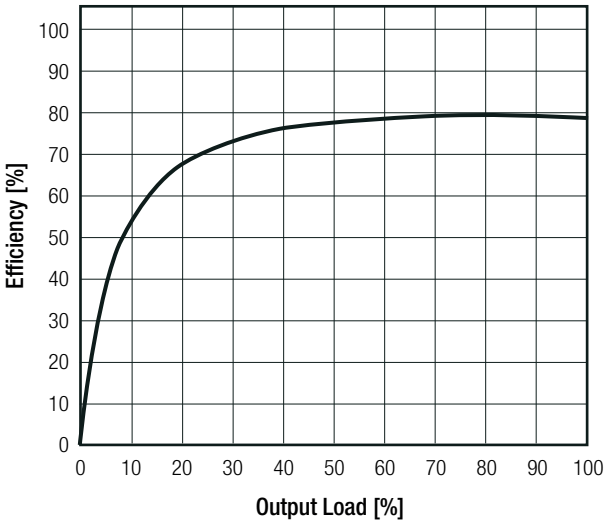
BASIC CHARACTERISTICS				
Parameter	**Condition**	**Min.**	**Typ.**	**Max.**
Internal Input Filter				capacitor
Input Voltage Range			±10.0%	
Input Current	nom. Vin = 5VDC nom. Vin= 12VDC nom. Vin = 24VDC		500mA 200mA 100mA	
Quiescent Current	nom. Vin = 5VDC nom Vin= 12VDC nom. Vin = 24VDC		40mA 30mA 15mA	
Minimum Load		0%		
Internal Operating Frequency		20kHz		
Output Ripple and Noise [5]	20MHz BW			150mVp-p

Notes:

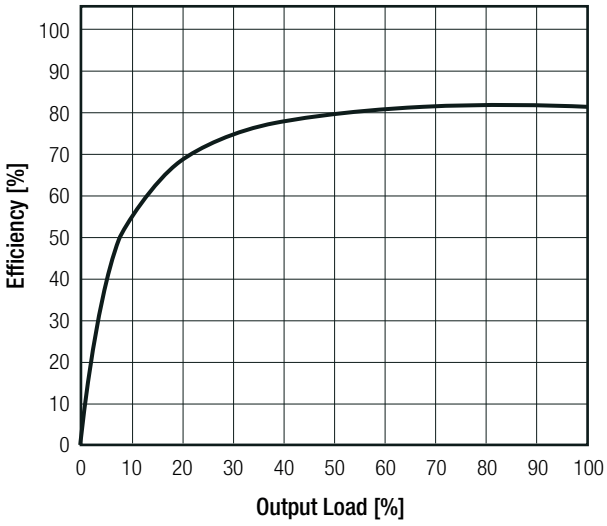
Note5: Measurements are made with a 0.1µF MLCC across output. (low ESR)

Efficiency vs. Load

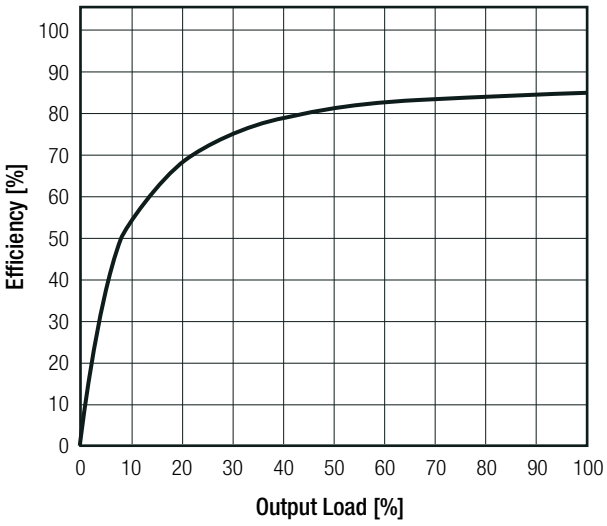
R2SX-053.3S(/H)



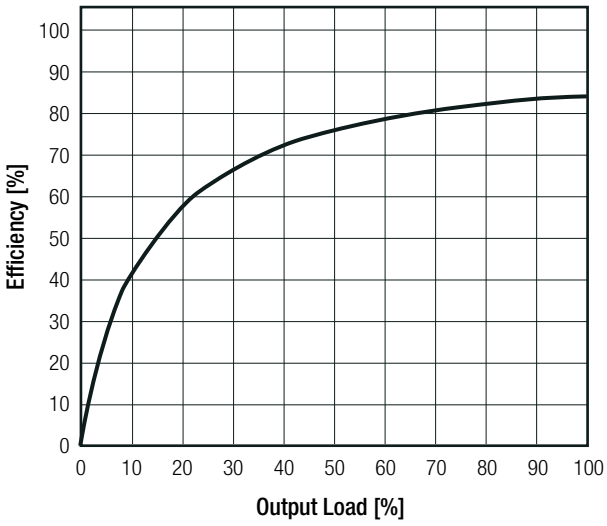
R2SX-0505S(/H)



R2SX-2405S(/H)



R2SX-2424S(/H)



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

REGULATIONS

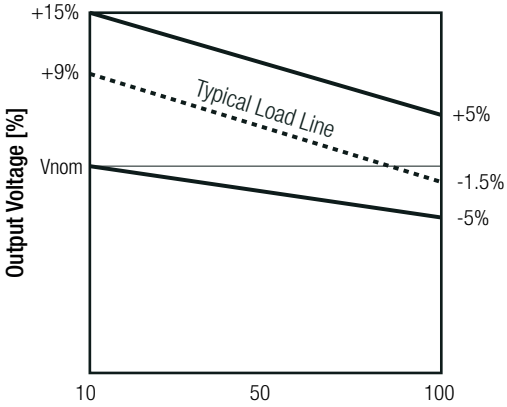
Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line		±1.2% typ. at 1.0% of Vin typ.
Load Regulation (6)	10% to 100% load	3.3Vout, 5Vout 12Vout 15Vout, 24Vout	15.0% max. 10.0% max.

Notes:

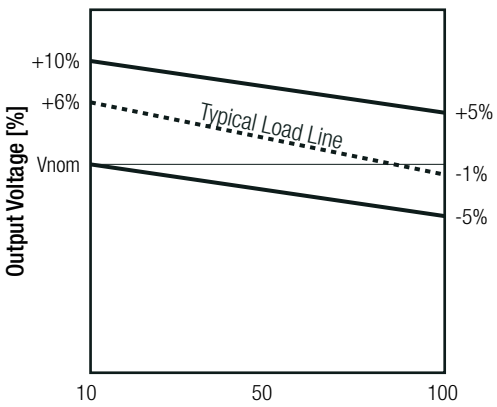
Note6: Operation below 10% load will not harm the converter, but specifications may not be met

Tolerance Envelope

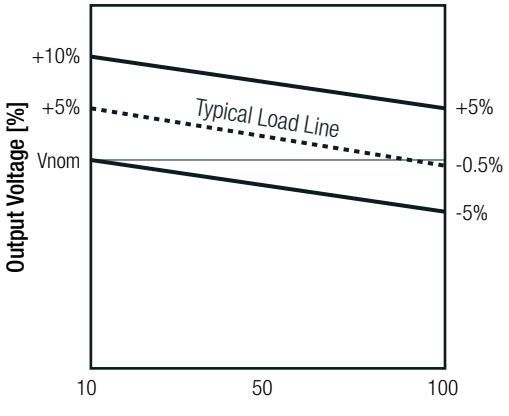
R2SX-05xx(/H)



R2SX-12xx(/H)



R2SX-24xx(/H)



PROTECTIONS

Parameter	Type			Value
Isolation Voltage	I/P to O/P	standard	tested for 1 second rated for 1 minute (7)	1kVDC 500VAC
	I/P to O/P	with suffix "/H"	tested for 1 second rated for 1 minute (7)	3kVDC 1.5kVAC
Isolation Resistance				10GΩ min.
Isolation Capacitance				100pF max.
Insulation Grade				functional

Notes:

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

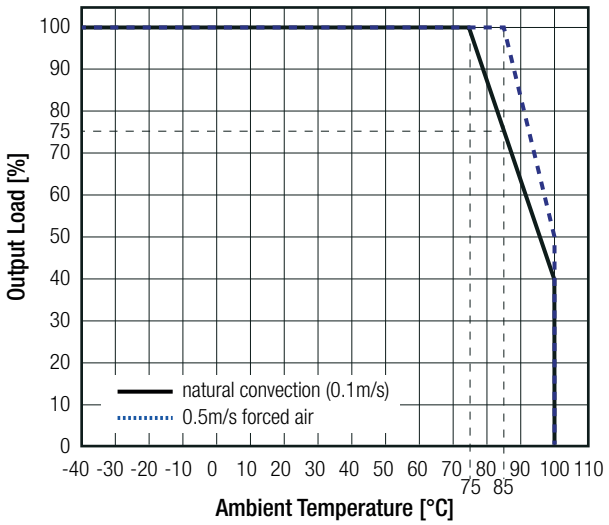
Note8: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

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

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	@ natural convection and full load (refer to ***"Derating Graph"***)		-40°C to +75°C
Operating Altitude			5000m
Operating Humidity	non-condensing		5% - 95% RH max.
Pollution Degree			PD2
Vibration			according to MIL-STD-202G
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +75°C	12100 x 10^3 hours 4400 x 10^3 hours

Derating Graph
(@ Chamber)



SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Audio/video, information and communication technology equipment - Safety requirements	E224736	UL62368-1, 2nd Edition, 2014 CAN/CSA -C22.2 No. 62368-1-14, 2nd Edition
Information Technology Equipment, General Requirements for Safety		UL60950-1, 2nd Edition, 2014 CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition
Audio/video, information and communication technology equipment - Safety requirements (CB Scheme)	WD-ITAV-190016-A0	IEC62368-1:2014, 2nd Edition
Audio/video, information and communication technology equipment - Safety requirements		EN62368-1:2014 + A11:2017
RoHS2		RoHS 2011/65/EU + AM2015/863

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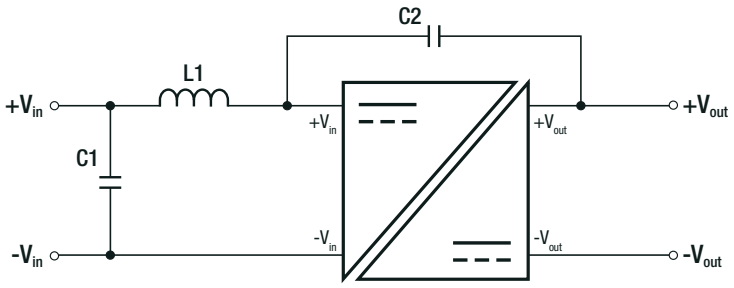
Specifications (measured @ Ta= 25°C, nominal input voltage, full load unless otherwise specified)

EMC Compliance	Condition	Standard / Criterion
Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements	with external filter (see filter suggestion below)	EN55032:2015 + AC:2016, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement	WH-CE-E1803002	EN55024:2010 + A1:2015
ESD Electrostatic discharge immunity test	Air: ±2, 4, 6, 8kV Contact: ±2, 4kV	EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	1, 3, 10V/m	EN61000-4-3:2010, Criteria A
Fast Transient and Burst Immunity	DC Power Port: ±0.5, 1, 2kV	EN61000-4-4:2012, Criteria A
Surge Immunity	DC Power Port: ±0.5, 1kV	EN61000-4-5:2017, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	10V r.m.s	EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	50Hz / 1A/m	EN61000-4-8:2010, Criteria A

EMC Filtering Suggestions for EN55032



Component List Class B

Model	C1	L1	C2
R2SX-05xx	10µF MLCC	10µH SMD Inductor	470pF/4kVDC
R2SX-12xx	4.7µF MLCC	22µH SMD Inductor	
R2SX-24xx	10µF MLCC	47µH SMD Inductor	

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	base PCB	black plastic, (UL94V-0) FR4, (UL94V-0)
Package Dimension (LxWxH)		15.24 x 11.1 x 8.0mm
Package Weight		1.6g typ.

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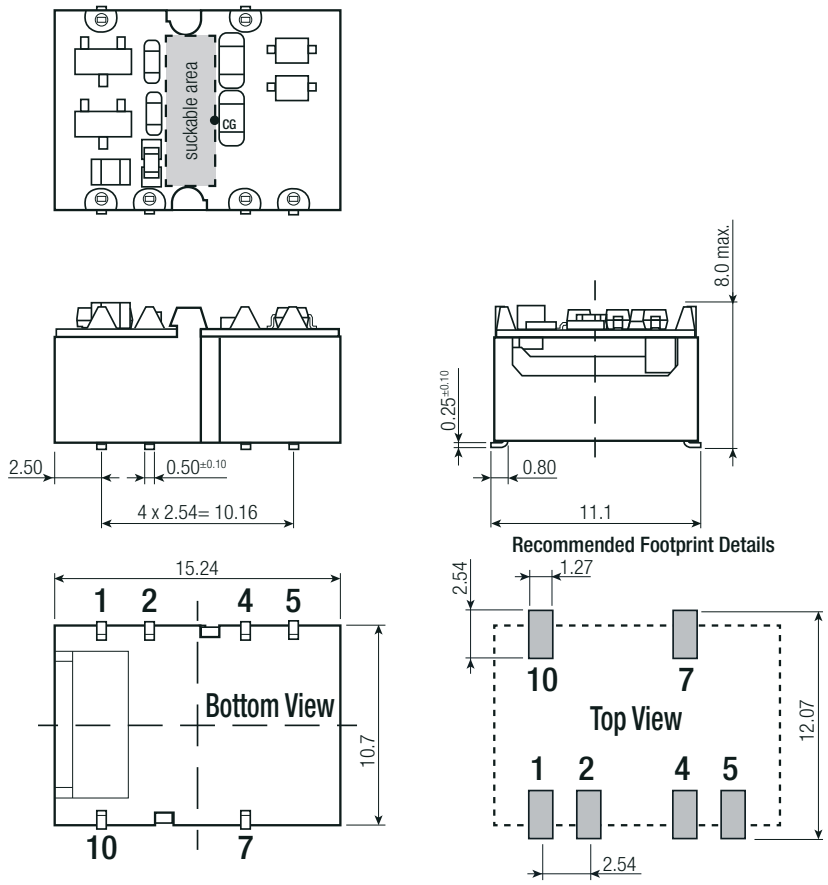
Specifications (measured @ Ta= 25°C, nominal input voltage, full load unless otherwise specified)

Dimension Drawing (mm)



Pin Connection

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

CG= center of gravity
NC= no connection
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

PACKAGING INFORMATION

Packaging Dimension (LxWxH)	tape and reel (carton)	355.0 x 340.0 x 35.0mm
	reel	330.2 x 330.2 x 30.0mm
	tray	260.0 x 205.0 x 27.0mm
Packaging Quantity	tape and reel	250pcs
	tray	30pcs
Tape Width		24.0mm
Storage Temperature Range	non-condensing	-55°C to +125°C
Storage Humidity		5% - 95% RH max.