Features

Regulated Converters

- Regulated output with internal linear regulator
- Isolated 0.5W power in SMD package
- Up to 2kVDC isolation
- Industry standard pinout
- -40°C to +100°C operating temperature
- IEC/EN/UL62368-1 certified, CB report

RECOM
DC/DC Converter

R0.5ZX

0.5 Watt SMD Single Output

Description

The R0.5ZX is similar to the R1SX but with the addition of an internal linear regulator to give a precise, load-independent and low noise output. The output is also continuously short circuit protected. In the event of a continuous overload or over-temperature condition, the output will shut down thus protecting the converter from damage. The output will automatically restart once the fault condition has been lifted. Typical applications include isolated 5V supplies for sensor, bus-interface and test and measurement circuits.

Selection Guide

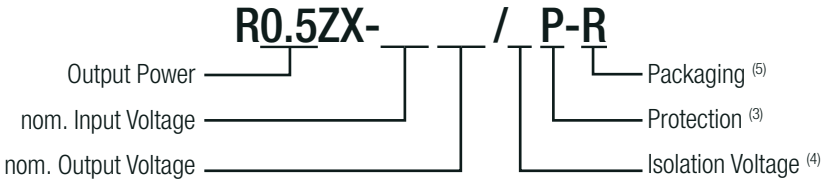
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
R0.5ZX-0505/P (3)	5	5	100	71	470

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

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
IEC/EN60950-1 certified
CB report
EN55032 compliant

Model Numbering



Notes:

Note3: standard part is with continuous short circuit protection
Note4: without suffix, standard isolation voltage (1kVDC/1 second)
with suffix „/H“, high isolation voltage (2kVDC/1 second)
Note5: with suffix „-R“, standard packaging tape and reel
with suffix „-Tray“ for optional tray packaging

Ordering Examples:

R0.5ZX-0505/P-R	5Vin	5Vout	Single Output	1kVDC/ 1 minute isolation	with SCP function	tape and reel packaging
R0.5ZX-0505/HP-R	5Vin	5Vout	Single Output	2kVDC/1 minute isolation	with SCP function	tape and reel packaging
R0.5ZX-0505/P-Tray	5Vin	5Vout	Single Output	1kVDC/ 1 minute isolation	with SCP function	tray packaging
R0.5ZX-0505/HP-Tray	5Vin	5Vout	Single Output	2kVDC/1 minute isolation	with SCP function	tray packaging

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

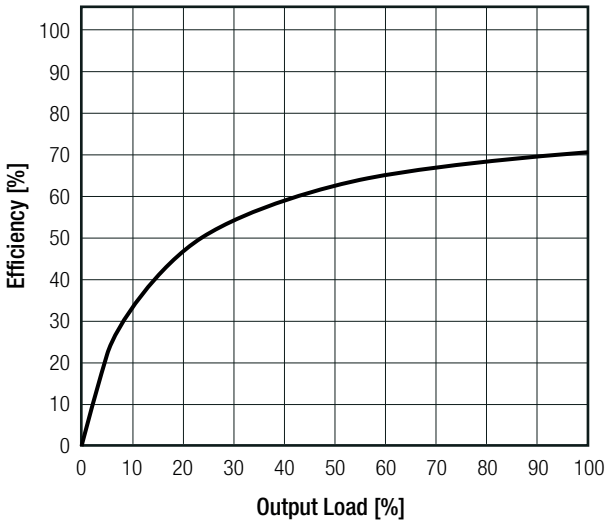
BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				capacitor
Input Voltage Range	nom. Vin = 5VDC		±5.0%	
Input Current			200mA	
Quiescent Current	nom. Vin = 5VDC		20mA	
Minimum Load		0%		
Internal Operating Frequency		20kHz		
Output Ripple and Noise [6]	20MHz BW		30mVp-p	100mVp-p

Notes:

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

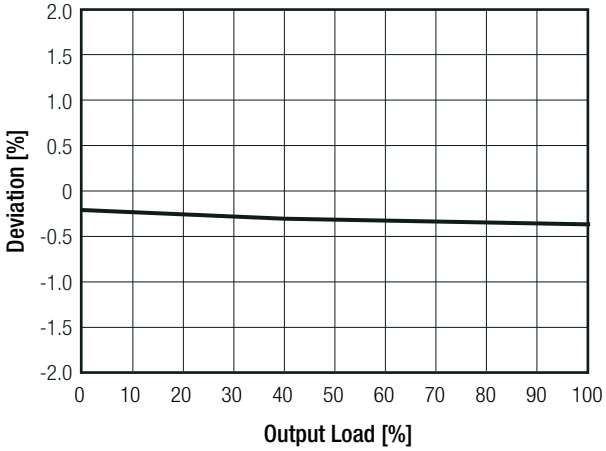
Efficiency vs. Load



REGULATIONS

Parameter	Condition	Value
Output Accuracy		-0.5 typ. / ±2.0% max.
Line Regulation	low line to high line, full load	±1.0% max.
Load Regulation	0% to 100% load	0.5 typ. / 1.0% max.

Deviation vs. Load



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

PROTECTIONS

Parameter	Type			Value
Short Circuit Protection (SCP)	below 100mΩ			continuous, automatic recovery
Isolation Voltage	I/P to O/P	standard	tested for 1 second rated for 1 minute (7)	1kVDC 500VAC
		with suffix "/H"	tested for 1 second rated for 1 minute (7)	2kVDC 1kVAC
Isolation Resistance				10GΩ min.
Isolation Capacitance				100pF max.
Leakage Current	standard with suffix "/H"			1µA max. 2µA max.
Insulation Grade				functional

Notes:

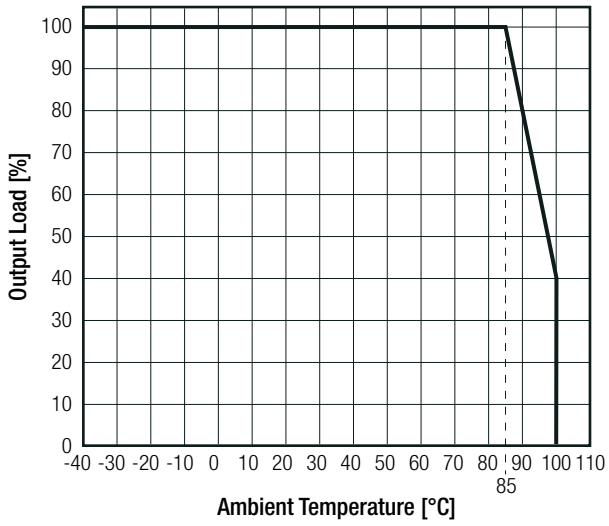
Note7: For repeat Hi-Pot testing, reduce the time and/or the test voltage

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

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	full load @ natural convection 0.1m/s (see graph)		-40°C to +85°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 +85°C	23000 x 10³ hours 2000 x 10³ hours

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



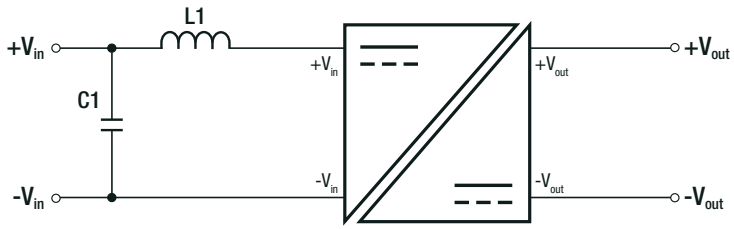
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

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 C-22.2 No. 60950-1-07, 2nd Edition
Audio/video, information and communication technology equipment - Safety requirements (CB Scheme)	E224736-4788277362-1	IEC62368-1:2014, 2nd Edition
Audio/video, information and communication technology equipment - Safety requirements		EN62368-1:2014 + A11:2017
Information Technology Equipment, General Requirements for Safety (CB Scheme)	E224736-4788277362-2	IEC60950-1:2005, 2nd Edition + A2:2013
Information Technology Equipment, General Requirements for Safety		EN60950-1:2006 + A2:2013
RoHS2+		RoHS 2011/65/EU + AM2015/863

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
ESD Electrostatic discharge immunity test	Air: ±6kV ; Contact: ±4kV	EN61000-4-2:2009, Criteria A
Fast Transient and Burst Immunity	±0.5kV	EN61000-4-4:2012, Criteria A
Surge Immunity	±1.0kV	EN61000-4-5:2017, Criteria A

EMC Filtering Suggestions for EN55032



Component List Class A

C1	L1
4.7µF 10V MLCC	5.6µH choke RLS-567

Component List Class B

C1	L1
22µF 10V MLCC	5.6µH choke RLS-567

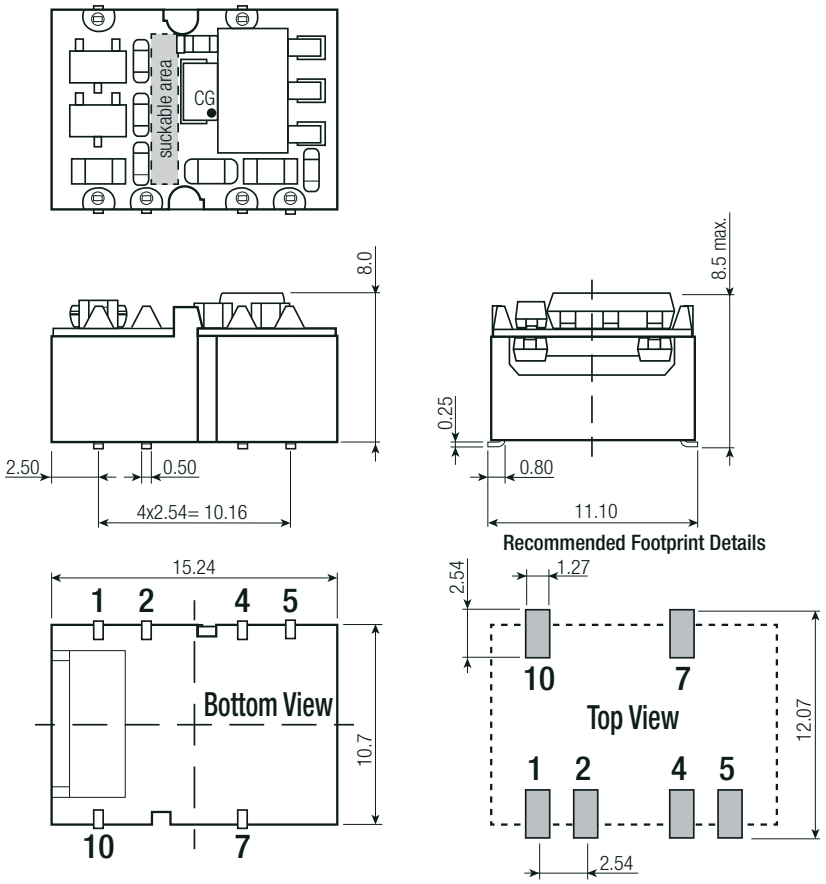
DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	base PCB	black plastic, (UL94V-0) FR4, (UL94V-0)
Dimension (LxWxH)		15.24 x 11.10 x 8.5mm
Weight		1.6g typ.

continued on next page

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

Dimension Drawing (mm)



Pin Connection

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

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

Pin dimension: ±0.1mm

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		-55°C to +125°C
Storage Humidity		5% - 95% RH max.

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