

Features

Regulated Converters

- 1kVDC/1s or 2kVDC/1s isolation
 - SMD package style
 - UL94 V-0 package material
 - Optional continuous short circuit protection
 - Toroidal magnetics



R1Z

**1 Watt
SMD
Miniature
Single Output**



Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [μ F]
R1Z-xx3.3	3.3, 5, 12, 15, 24	3.3	303	55	3300
R1Z-xx05	3.3, 5, 12, 15, 24	5	200	60	3300
R1Z-xx09	3.3, 5, 12, 15, 24	9	111	60	680
R1Z-xx12	3.3, 5, 12, 15, 24	12	84	63	680
R1Z-xx15	3.3, 5, 12, 15, 24	15	66	65	470



The logo consists of the letters 'UL' in a bold, italicized font, with a registered trademark symbol (®) above it. Below 'UL' is the word 'E358085'.

Notes:

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

Note2: Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

**UL60950-1 certified
CAN/CSA-C22.2 No. 60950-1-07 certified
IEC/EN60950-1 certified
EN55032 compliant**

Model Numbering



Notes:

Note3: add suffix "/H" for 2kVDC/1s isolation without suffix standard 1kVDC/1s isolation (refer to "**PROTECTIONS**")

Note4: add suffix "/P" for Continuous Short Circuit Protection
in combination with "/H". use "/HP" (refer to "PROTEC

Note5: add suffix “-R” for Tape and Reel Packaging, without suffix standard tube packaging
(refer to “**PACKAGING INFORMATION**”)

Ordering Examples:

R1Z-2405/P:	24Vin	5Vout	1kVDC/1s Isolation	SCP function	Tube Packaging
R1Z-0512/H:	5Vin	12Vout	2kVDC/1s Isolation	no SCP function	Tube Packaging
R1Z-2415/HP:	24Vin	15Vout	2kVDC/1s Isolation	SCP function	Tube Packaging
R1Z-1205-R:	12Vin	5Vout	1kVDC/1s Isolation	SCP function	Tape and Reel Packaging

PREFERRED ALTERNATIVES



REM2A

Specifications (measured @ $T_a = 25^\circ\text{C}$, nom. Vin, full load and after warm-up unless otherwise stated)

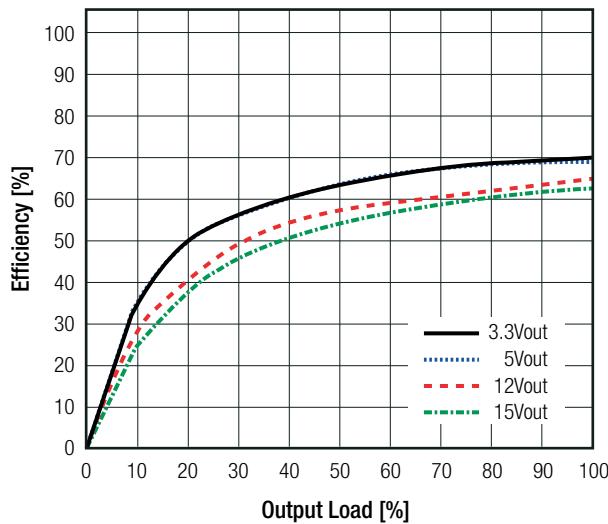
BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				capacitor
Input Voltage Range			$\pm 5\%$	
No Load Power Consumption		134mW	217mW	350mW
Minimum Load ⁽⁶⁾		10%		
Internal Operating Frequency		20kHz	40kHz	80kHz
Output Ripple and Noise	20MHz BW			100mVp-p

Notes:

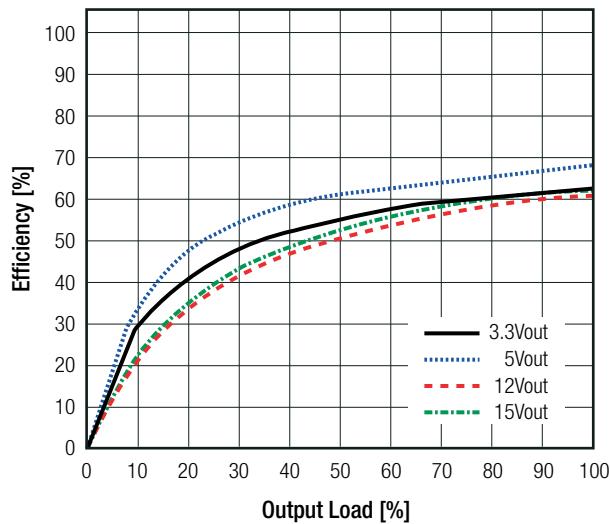
Note6: Operation below 10% load will not harm the converter, but specifications may not be met

Efficiency vs. Load (with SCP function)

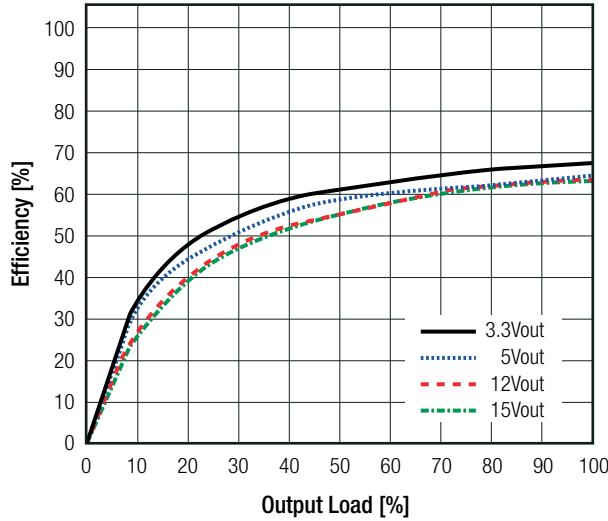
R1Z-3.3xx/P



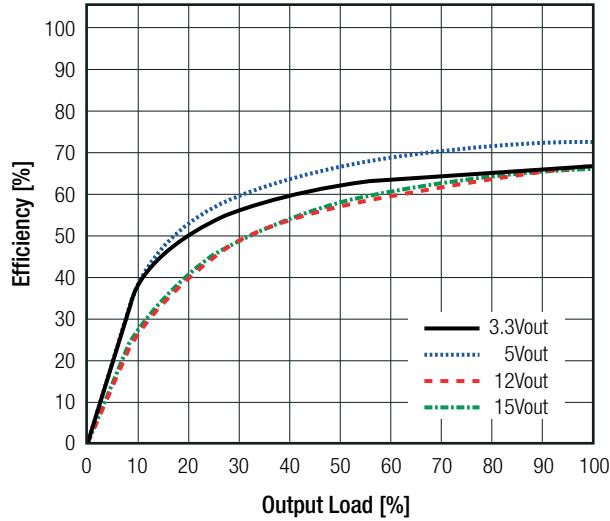
R1Z-05xx/P



R1Z-12xx/P



R1Z-15xx/P

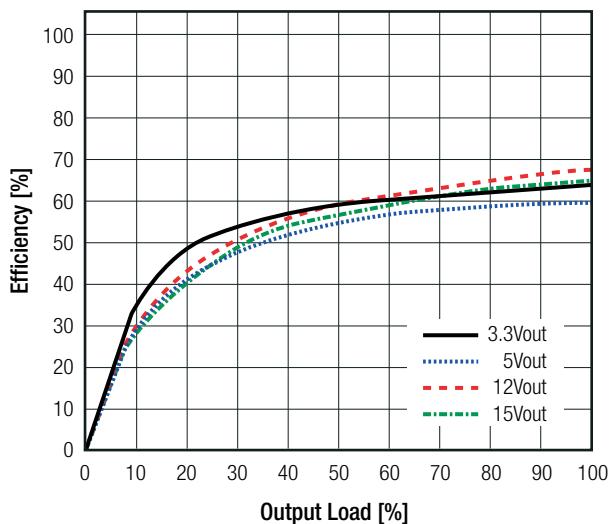


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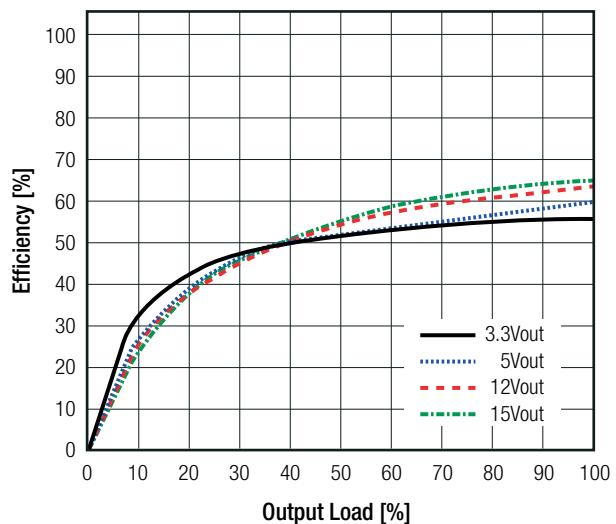
Specifications (measured @ $T_a = 25^\circ\text{C}$, nom. Vin, full load and after warm-up unless otherwise stated)

Efficiency vs. Load (without SCP function)

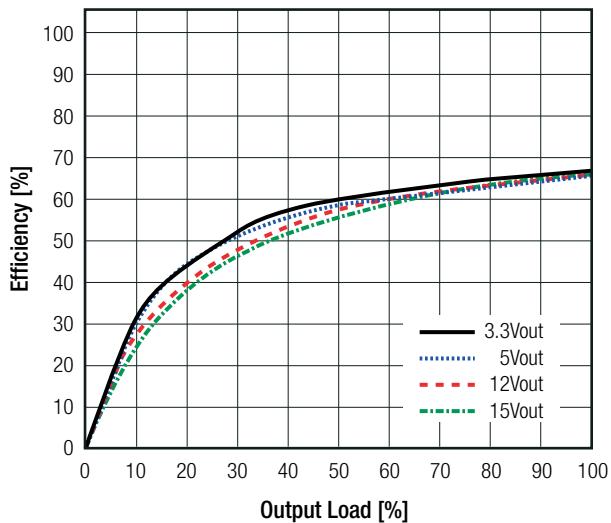
R1Z-3.3xx



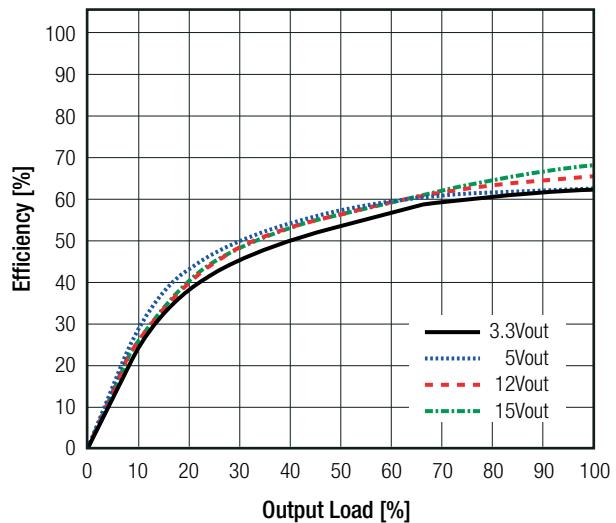
R1Z-05xx



R1Z-12xx



R1Z-15xx



REGULATIONS

Parameter	Condition	Value
Output Accuracy		$\pm 2\%$ max.
Line Regulation	low line to high line, full load	$\pm 1\%$ max.
Load Regulation	10% to 100% load	1% max.

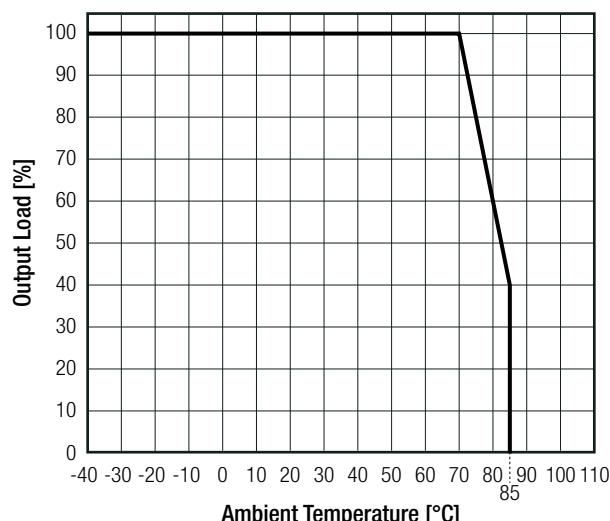
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PROTECTIONS					
Parameter	Type		Value		
Short Circuit Protection (SCP)	below 100mΩ	without suffix with suffix "/P"	1 second continuous		
Isolation Voltage ⁽⁷⁾	without suffix	tested for 1 second rated for 1 minute	1kVDC 500VAC/ 60Hz		
	with suffix "/H"	tested for 1 second rated for 1 minute	2kVDC 1kVAC/ 60Hz		
Isolation Resistance			10GΩ min.		
Isolation Capacitance			70pF typ./ 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					

ENVIRONMENTAL			
Parameter	Condition		Value
Operating Temperature Range	without derating (see graph)		-40°C to +70°C
Thermal Impedance	@natural convection		32K/W
Operating Altitude			3000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	2495 x 10 ³ hours
		+70°C	1100 x 10 ³ hours
		+25°C	2387 x 10 ³ hours
		+70°C	641 x 10 ³ hours

Derating Graph

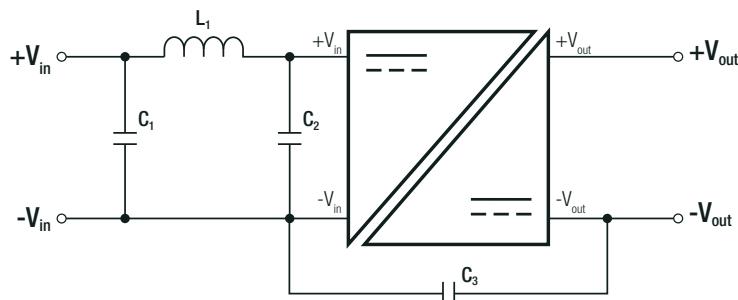
(@ Chamber and natural convection 0.1m/s)



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

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report Number	Standard
Information Technology Equipment, General Requirements for Safety (LVD)	SPCLVD1605077-08	IEC60950-1:2005, 2nd Edition, A2: 2013 EN60950-1:2006, A2:2013
Information Technology Equipment, General Requirements for Safety	E358085-A2	UL60950-1, 2nd Edition, 2007 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2007
Medical Electric Equipment, General Requirements for Safety and Essential Performance	SPC1005061	IEC 60601-1:1988+A2:1995 EN 60601-1:1990+A13:1996
RoHS2		RoHS-2011/65/EU + AM-2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external components (see filter suggestion below)	EN55032, Class A EN55032, Class B

EMC Filtering Suggestions according to EN55032

Component List Class A

MODEL	C1	L1	C2	C3
R1Z-0505S/H2	10µF			1nF
R1Z-1205S/H2		N/A	10µF	
R1Z-2405S/H2				N/A
R1Z-4805S/H2				

Component List Class B

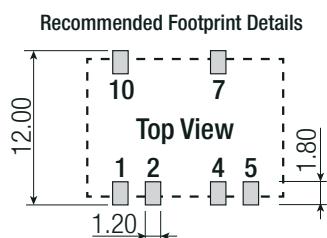
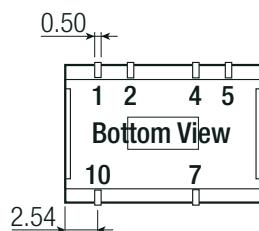
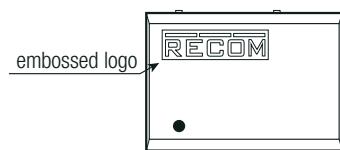
MODEL	C1	L1	C2	C3
R1Z-0505S/H2		3.9µH RLS-397		
R1Z-1205S/H2	10µF		N/A	
R1Z-2405S/H2		12µH RLS-126		1nF
R1Z-4805S/H2				

DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	Type	Value
Material	case	non conductive-black plastic, (UL94 V-0)
Dimension (LxWxH)		15.24 x 10.7 x 9.0mm
Weight		1.6g typ.

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Specifications (measured @ $T_a = 25^\circ\text{C}$, nom. Vin, full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)



Pinning Information

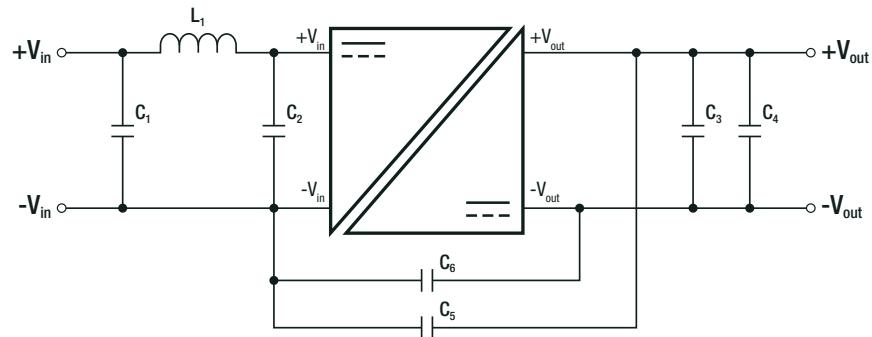
Pin #	Single
1	-Vin
2	+Vin
4	-Vout
5	-Vout
7	+Vout
10	NC

NC= no connection

Tolerance: $xx.x = \pm 0.5\text{mm}$
 $xx.xx = \pm 0.25\text{mm}$

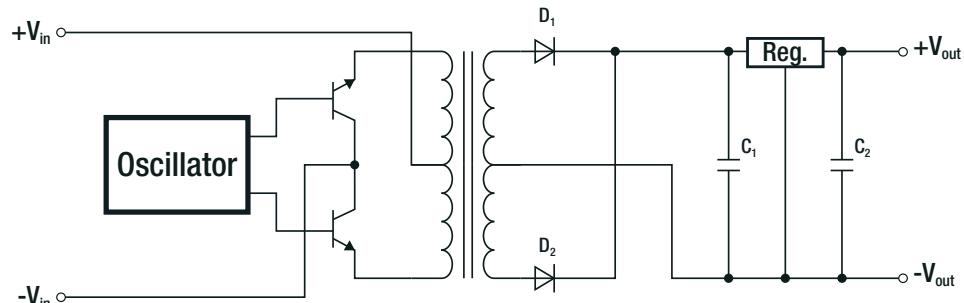
INSTALLATION AND APPLICATION

Low Noise Application



C_1, C_2, C_3, C_4	C_5, C_6	L_1
$10\mu\text{F}$	10nF	$4.7\mu\text{H}$

Post-regulated Single Output



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)	530.0 x 17.0 x 13.0mm 355.0 x 342.0 x 36.0mm
Packaging Quantity	tube tape and reel	33pcs 250pcs
Tape Width		24mm
Storage Temperature Range		-55°C to +105°C
Storage Humidity	non-condensing	95% RH max.

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