

Features

Regulated Converters

- 1kVDC & 2kVDC Isolation
- UL94V-0 Package Material
- RoHS 6/6
- Toroidal Magnetics
- Optional Continuous Short Circuit Protected
- Built-In EN55022 Class A Filter

Description

The R1Z series DC/DC converter has been designed for isolating or converting DC power rails where an SMD format with regulated output is required, although it is no larger than a standard unregulated SMD converter.

Selection Guide

Part Number SMD	2kVDC	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Max Capacitive Load ⁽¹⁾
R1Z-xx3.3*	(/H)	3.3, 5, 12, 15, 24	3.3	303	2200µF
R1Z-xx05*	(/H)	3.3, 5, 12, 15, 24	5	200	1200µF
R1Z-xx09*	(/H)	3.3, 5, 12, 15, 24	9	111	680µF
R1Z-xx12*	(/H)	3.3, 5, 12, 15, 24	12	84	680µF
R1Z-xx15*	(/H)	3.3, 5, 12, 15, 24	15	66	470µF

xx= Input Voltage (other input and output voltage combinations available on request)

*add suffix -R for tape & reel packing e.g. R1Z-0505-R

*add suffix /P for continuous short circuit protection, e.g. R1Z-0505/P-R

Specifications (measured at $T_A = 25^\circ\text{C}$, nominal input voltage, full load and after warm-up)

Input Voltage Range		$\pm 5\%$
Output Voltage Accuracy		$\pm 2\%$
Line Voltage Regulation		1% max.
Load Voltage Regulation		1% max.
Output Ripple and Noise (at 20MHz BW)		100mVp-p max.
Operating Frequency		20kHz min. / 40kHz typ. / 80kHz max.
Efficiency at Full Load		50% min. / 60% typ.
Minimum Load		10% ⁽²⁾
No Load Power Consumption		134mW min. / 217mW typ. / 350mW max.
Isolation Voltage		(tested for 1 second) 1000VDC (rated for 1 minute**) 500VAC / 60Hz
Isolation Voltage	H-Suffix	(tested for 1 second) 2000VDC (rated for 1 minute**) 1000VAC / 60Hz
Isolation Capacitance		70pF typ.
Isolation Resistance		10 GW min.
Short Circuit Protection		1 Second
P-Suffix		Continuous
Operating Temperature Range (natural convection)		-40°C to +70°C (see Graph)
Storage Temperature Range		-55°C to +125°C
Reflow Temperature	ROHS compliant	245°C (30 sec) max.
Vapour Phase Process		230°C (90 sec) max.
		(for more details see Application Notes)
Relative Humidity		95% RH
Package Weight		1.6g
Packing Quantity		33 pcs per tube 250 pcs per Reel
MTBF	R1Z (+25°C)	using MIL-HDBK 217F 2203 x 10 ³ hours
	(+70°C)	using MIL-HDBK 217F 391 x 10 ³ hours
	R1Z/P (+25°C)	using MIL-HDBK 217F 2387 x 10 ³ hours
	(+70°C)	using MIL-HDBK 217F 641 x 10 ³ hours

For detailed information see Application Notes chapter "MTBF"

Conducted / Radiated Emissions	EN55022	Level A
EN General Safety	Report: SPCLVD1211033-3	EN60950-1:2006 + A12:2011
EN Medical Safety	Report: MDD1205098-4 + RM1205098-4	IEC/EN 60601-1 3rd Edition
		Medical Report + ISO14971 Risk Assessment
UL General Safety	Report: E358085	UL60950-1, 2nd Edition

ECONOLINE

DC/DC-Converter

with 3 year Warranty

RECOM

1 Watt SMD Miniature Isolated Single Output



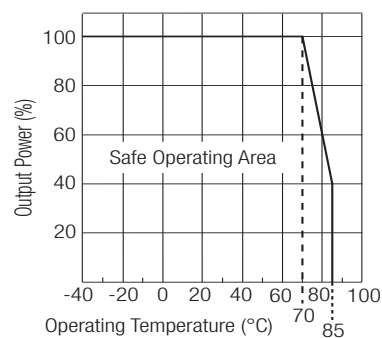
E358085



EN-60950-1 Certified
EN-60601-1 Certified*
UL-60950-1 Certified
(* /H suffix)

R1Z

Derating-Graph (Ambient Temperature)

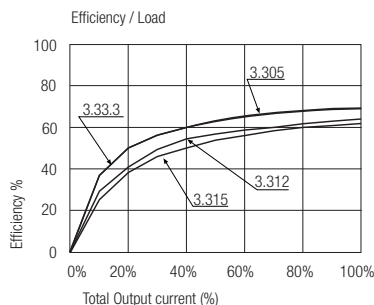


**Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.

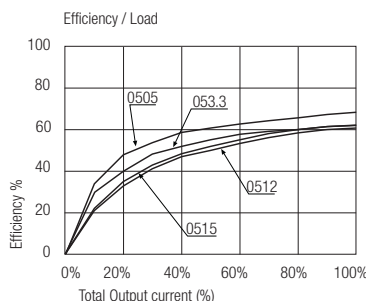
Refer to Application Notes

Typical Characteristics

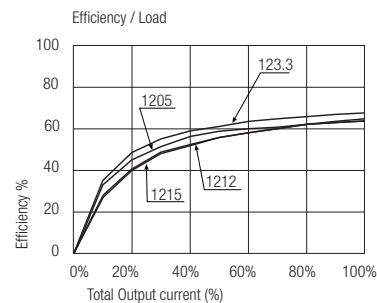
R1Z-3.3xx/P



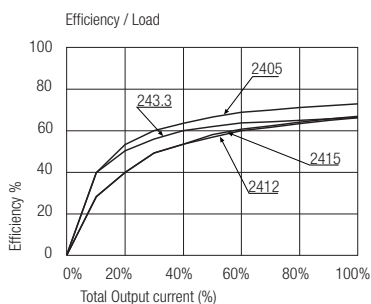
R1Z-05xx/P



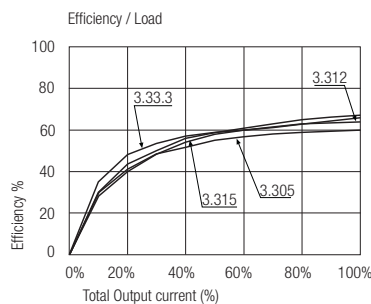
R1Z-12xx/P



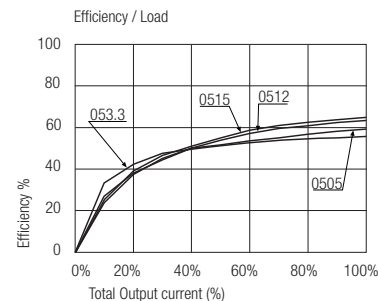
R1Z-15xx/P



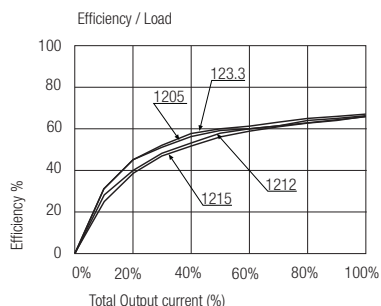
R1Z-3.3xx



R1Z-05xx



R1Z-12xx

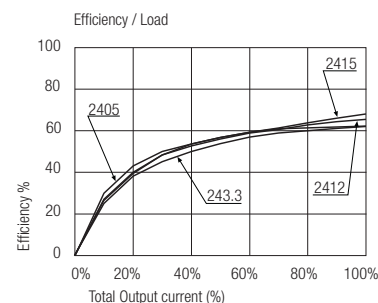


Notes

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

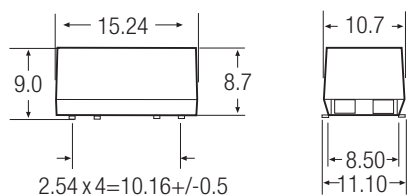
Note 2: The R1Z series requires a minimum of 10% load on the output to maintain specified regulation. Operating under no-load conditions will not damage these devices; however, they may not meet all listed specifications.

R1Z-15xx

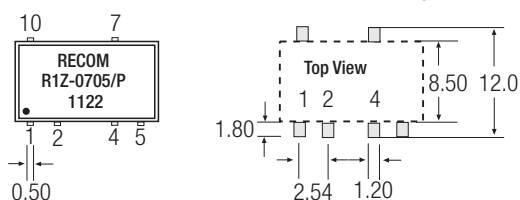


Package Style and Pinning (mm)

10 PIN Single SMD Package



Recommended Footprint Details



Ordering Example: R1Z-0505 (5V Input, 5V Output, not short circuit protected)
R1Z-0505/HP (5V Input, 5V Output, 2kVDC Isolation and short circuit protection)

Pin Connections

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

NC= No Connection

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

RECOM:

[R1Z-0505](#) [R1Z-0505/H](#) [R1Z-0505/HP](#) [R1Z-0505/HP-R](#) [R1Z-0505/H-R](#) [R1Z-0505/P](#) [R1Z-0505/P-R](#) [R1Z-0505-R](#)
[R1Z-0509](#) [R1Z-0509/H](#) [R1Z-0509/H-R](#) [R1Z-0509-R](#) [R1Z-0512](#) [R1Z-0512/H](#) [R1Z-0512/H-R](#) [R1Z-0512-R](#) [R1Z-](#)
[053.3/HP](#) [R1Z-053.3/HP-R](#) [R1Z-053.3/P](#) [R1Z-053.3/P-R](#) [R1Z-1205](#) [R1Z-1205/H](#) [R1Z-1205/HP](#) [R1Z-1205/HP-R](#)
[R1Z-1205/H-R](#) [R1Z-1205/P](#) [R1Z-1205/P-R](#) [R1Z-1205-R](#) [R1Z-1209](#) [R1Z-1209/H](#) [R1Z-1209/H-R](#) [R1Z-1209-R](#) [R1Z-](#)
[1212](#) [R1Z-1212/H](#) [R1Z-1212/H-R](#) [R1Z-1212-R](#) [R1Z-123.3/HP](#) [R1Z-123.3/HP-R](#) [R1Z-123.3/P](#) [R1Z-123.3/P-R](#) [R1Z-](#)
[1505](#) [R1Z-1505/H](#) [R1Z-1505/HP](#) [R1Z-1505/HP-R](#) [R1Z-1505/H-R](#) [R1Z-1505/P](#) [R1Z-1505/P-R](#) [R1Z-1505-R](#) [R1Z-](#)
[1509](#) [R1Z-1509/H](#) [R1Z-1509/H-R](#) [R1Z-1509-R](#) [R1Z-1512](#) [R1Z-1512/H](#) [R1Z-1512/H-R](#) [R1Z-1512-R](#) [R1Z-153.3/HP](#)
[R1Z-153.3/HP-R](#) [R1Z-153.3/P](#) [R1Z-153.3/P-R](#) [R1Z-2405](#) [R1Z-2405/H](#) [R1Z-2405/HP](#) [R1Z-2405/HP-R](#) [R1Z-2405/H-](#)
[R](#) [R1Z-2405/P](#) [R1Z-2405/P-R](#) [R1Z-2405-R](#) [R1Z-2409](#) [R1Z-2409/H](#) [R1Z-2409/H-R](#) [R1Z-2409-R](#) [R1Z-2412](#) [R1Z-](#)
[2412/H](#) [R1Z-2412/H-R](#) [R1Z-2412-R](#) [R1Z-243.3/HP](#) [R1Z-243.3/HP-R](#) [R1Z-243.3/P](#) [R1Z-243.3/P-R](#) [R1Z-3.305](#) [R1Z-](#)
[3.305/H](#) [R1Z-3.305/HP](#) [R1Z-3.305/HP-R](#) [R1Z-3.305/H-R](#) [R1Z-3.305/P](#) [R1Z-3.305/P-R](#) [R1Z-3.305-R](#) [R1Z-3.309](#)
[R1Z-3.309/H](#) [R1Z-3.309/H-R](#) [R1Z-3.309-R](#) [R1Z-3.312](#) [R1Z-3.312/H](#) [R1Z-3.312/H-R](#) [R1Z-3.312-R](#) [R1Z-3.33.3/HP](#)
[R1Z-3.33.3/HP-R](#) [R1Z-3.33.3/P](#) [R1Z-3.33.3/P-R](#)