

# 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 <sup>(1)</sup>
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		±5%
Output Voltage Accuracy		±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.
Vapor 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 <sup>3</sup> hours
	(+70°C)	using MIL-HDBK 217F 391 x 10 <sup>3</sup> hours
	R1Z/P (+25°C)	using MIL-HDBK 217F 2387 x 10 <sup>3</sup> hours
	(+70°C)	using MIL-HDBK 217F 641 x 10 <sup>3</sup> 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



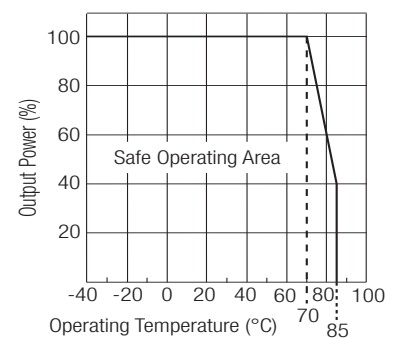
**E358085**



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

# R1Z

## Derating-Graph (Ambient Temperature)

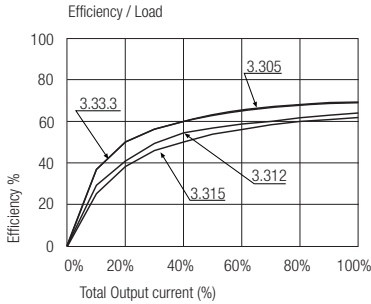


\*\*Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.

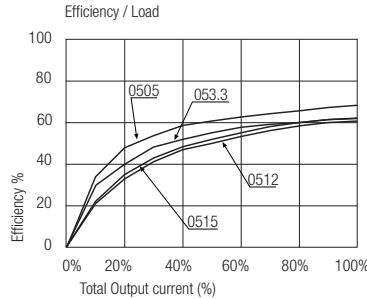
**Refer to Application Notes**

**Typical Characteristics**

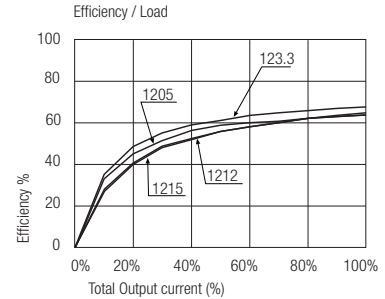
**R1Z-3.3xx/P**



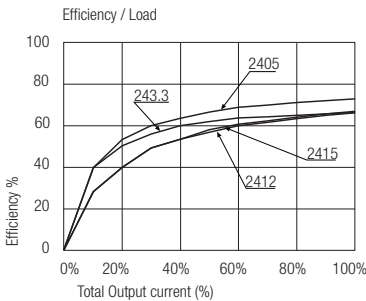
**R1Z-05xx/P**



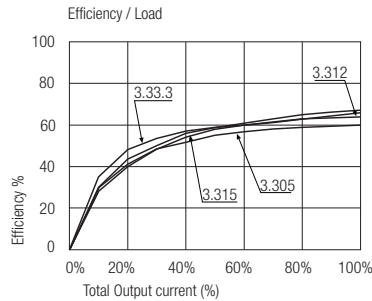
**R1Z-12xx/P**



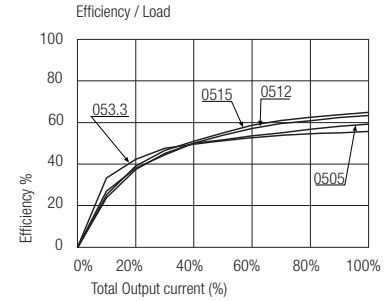
**R1Z-15xx/P**



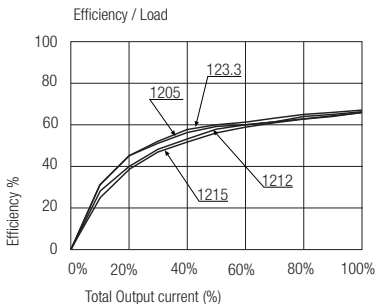
**R1Z-3.3xx**



**R1Z-05xx**



**R1Z-12xx**

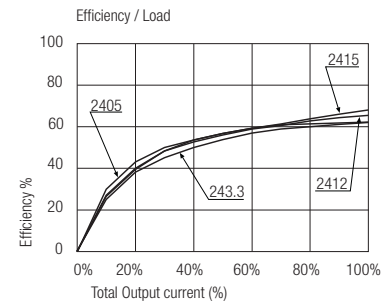


**Notes**

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 the maintain specified regulation. Operating under no-load conditions will not damage these devices; however, they may not meet all listed specifications.

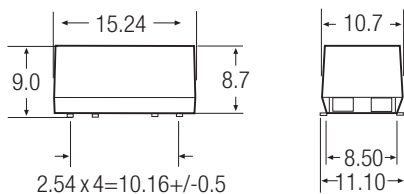
**R1Z-15xx**



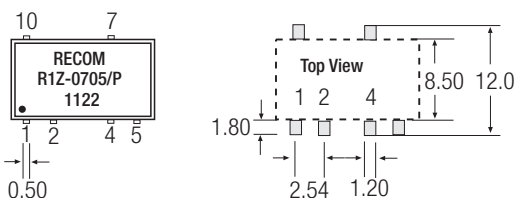
R1Z/P

**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

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