

## Features

## Unregulated Converter

- Fully RoHS 6/6 Conform
- Full Power at 100°C Ambient Temperature
- 1kVDC Isolation
- Suitable for Fully Automated Assembly (including Vapor Phase Soldering)
- Optional Continuous Short Circuit Protection

### Description

The R1DA converters are of the enclosed open frame type, i.e. they are not potted. The converters are typically used in general purpose and industrial low power isolation and voltage matching applications where an SMD converter is required. The converter series feature an extended ambient temperature operating range of -40°C to +100°C without derating and optional continuous short circuit protection. In addition to single, dual and independent outputs, two isolation options and three different case formats, the converters are also available prepacked as tape and reel for use with automatic insertion machines.

### Selection Guide

Part Number SMD	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency typ. (%)	Max Capacitive Load <sup>(1)**</sup>
R1DA**xx3.33.3	3.3, 5, 9, 12, 15, 24	3.3/3.3	150/150	75	470µF/470µF
R1DA**xx0505	3.3, 5, 9, 12, 15, 24	5/5	100/100	72-78	470µF/470µF
R1DA**xx0909	3.3, 5, 9, 12, 15, 24	9/9	56/56	74-78	220µF/220µF
R1DA**xx1212	3.3, 5, 9, 12, 15, 24	12/12	42/42	75-80	68µF/68µF
R1DA**xx1515	3.3, 5, 9, 12, 15, 24	15/15	33/33	75-82	68µF/68µF

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

\* add Suffix "P" for Continuous Short Circuit Protection, e. g. R1DA-050505/P

\* add Suffix -R for Tape & Reel Packing e.g. R1DA-050505-R. For more Details see Application Notes.

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

Input Voltage Range	$\pm 10\%$	
Output Voltage Accuracy	-1% typ., $\pm 5\%$ max.	
Line Voltage Regulation (Low Line to High Line @ max. Load)	All Variants	1% typ.
Load Regulation (10% to 100% Load)	3.3V output types	15% typ., 20% max.
	5V output types	12% typ. / 15% max.
	9V output types	7% typ., 10% max.
	12V, 15V output types	6% typ., 10% max.
Output Ripple and Noise (20MHz BW limited)	50 mVp-p typ. / 100mVp-p max.	
Operating Frequency	20kHz min. / 50kHz typ. / 90kHz max.	
Efficiency at Full Load	See Selection Guide	
Minimum Load = 0%	Specifications valid for 10% minimum Load only	
Isolation Voltage Input/Output (tested for 1 second)	1000VDC	
Isolation Voltage Output/Output (rated for 1 minute**)	500VAC / 60Hz	
Isolation Capacitance	75pF max.	
Isolation Resistance $V_{iso}=500V$	10 GΩ min.	
Short Circuit Protection	1 Second	
P-Suffix	Continuous	
Operating Temperature Range	-40°C to +100°C (see Graph)	
Storage Temperature Range	-50°C to +125°C	
Reflow Temperature	RoHS compliant	245°C (30 sec), Peak 255°C (5 sec) max.
Vapor Phase Process	(for more details see Application Notes) 230°C (90 sec) max.	
Relative Humidity	95% RH	
Humidity Susceptibility Test	1000 hrs / 90% humidity / +85°C ambient	

continued on next page

\*\*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.

**ECONOLINE**  
DC/DC-Converter

**RECOM**

## 1 Watt SMD Dual Independent Outputs



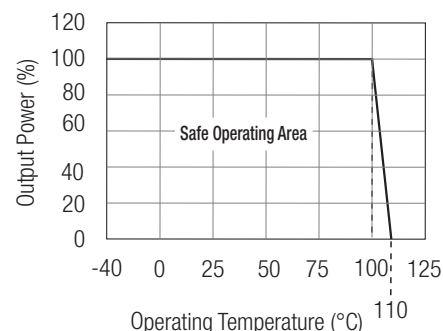
**E358085**

**UL-60950-1-Certified**  
**EN-60950-1-Certified**

**R1DA**

## Derating-Graph (Ambient Temperature)

**R1DA-0505**



**Refer to Application Notes**

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

Package Weight		1.2g
Packing Quantity		33 pcs per tube / 500 pcs per reel
MTBF	Using MIL-HDBK 217F (+25°C)	1045 x 10 <sup>3</sup> hours
	Using MIL-HDBK 217F (+85°C)	183 x 10 <sup>3</sup> hours

Detailed Information see Application Notes chapter „MTBF“

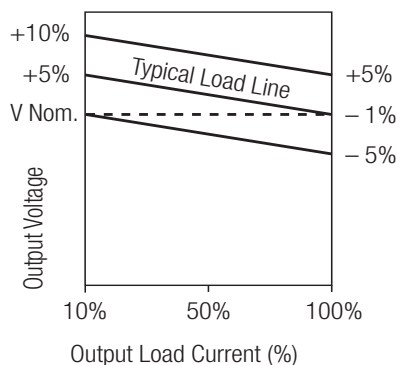
#### Certifications

EN General Safety	Report: 10010807-2009	EN-60950-1, 2nd Edition
Conducted Emissions		EN55022 Class B with Filter
Radiated Emissions		EN55022 Class B with Filter
UL General Safety	Report: E358085	UL60950-1, 2nd Edition

#### Notes

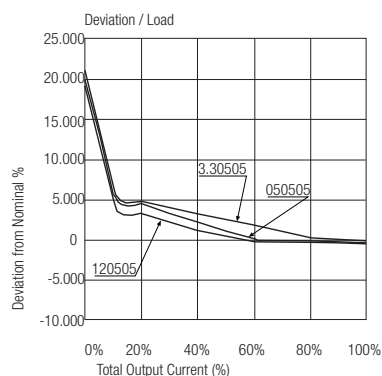
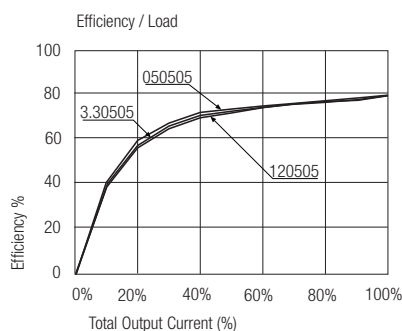
Note 1: Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Tolerance Envelope

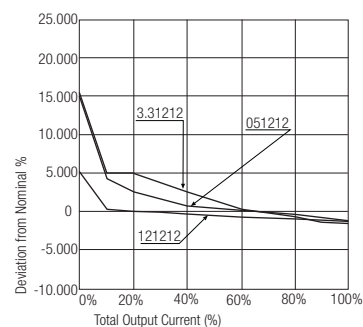
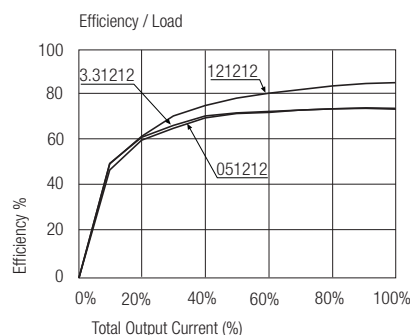


### Typical Characteristics

#### R1DA-xx0505

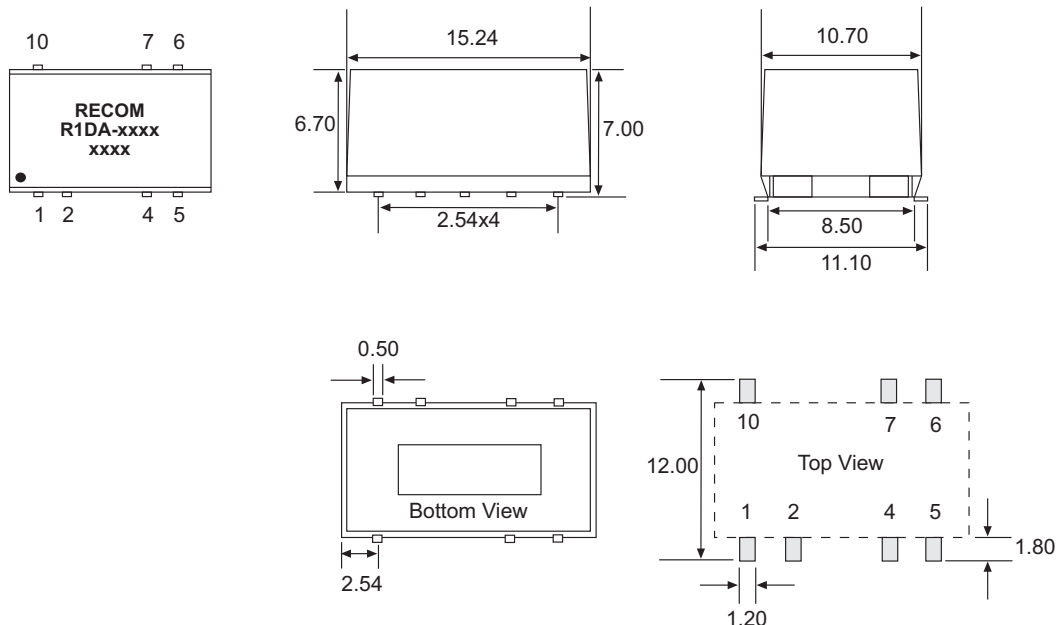


#### R1DA-xx1212



### Package Style and Pinning (mm)

#### 2 PIN Dual SMD Package

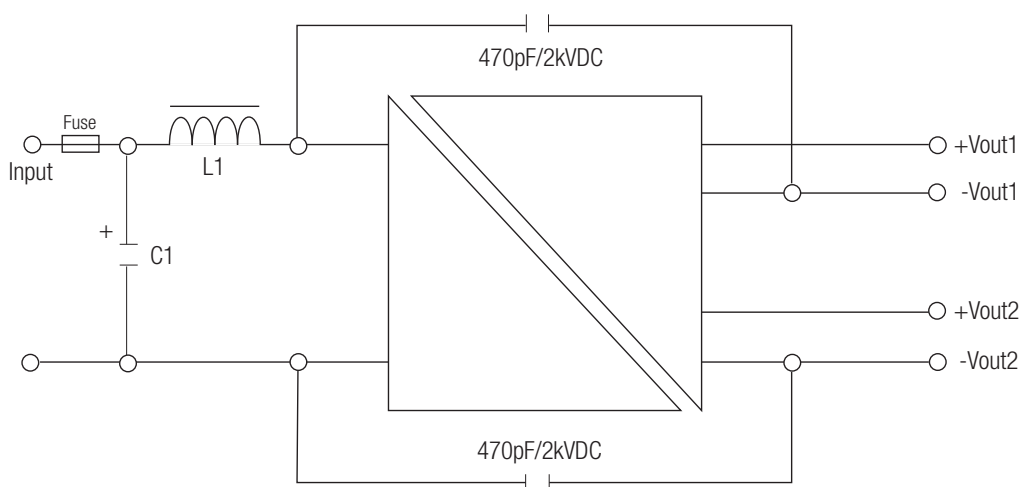


#### Pin Connections

Pin #	Function
1	-Vin
2	+Vin
4	-Vout1
5	+Vout1
6	-Vout2
7	+Vout2
10	NC

NC= No Connection

### EMC Filtering - Suggestion for EN55022 Class B (Conducted and emitted)



#### Standard

C1	L1	Vin
2.2μF	4.7μH	3.3V
2.2μF	4.7μH	5V
2.2μF	10μH	9V
2.2μF	10μH	12V
2.2μF	10μH	15V
2.2μF	22μH	24V

#### /P versions

C1	L1	Vin
4.7μF	10μH	3.3V
4.7μF	10μH	5V
4.7μF	10μH	9V
4.7μF	10μH	12V
4.7μF	22μH	15V

C1 = MLCC

L1 = SMD Inductor