



**THE DATASHEET OF  
R1DA-3.31212/P-R**



# Features

# Unregulated Converters

- Fully RoHS 10/10 conform
- Full power at +100°C ambient temperature
- 1kVDC/1s isolation
- UL60950-1 and IEC/EN60950-1 certified
- Suitable for fully automated assembly (including vapor phase soldering)
- Optional continuous short circuit protection



## R1DA

**1 Watt  
SMD  
Dual Independent  
Outputs**



### 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

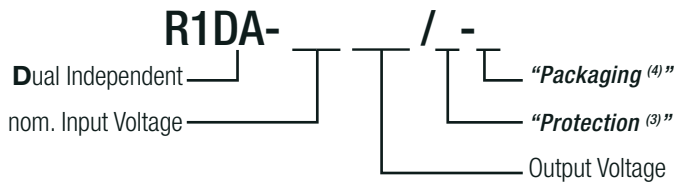
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	max. Capacitive Load <sup>(2)</sup> [µF]
R1DA-xx3.33.3 <sup>(3,4)</sup>	3.3, 5, 9, 12, 15, 24	3.3/3.3	150/150	75	470/470
R1DA-xx0505 <sup>(3,4)</sup>	3.3, 5, 9, 12, 15, 24	5/5	100/100	72-78	470/470
R1DA-xx0909 <sup>(3,4)</sup>	3.3, 5, 9, 12, 15, 24	9/9	56/56	74-78	220/220
R1DA-xx1212 <sup>(3,4)</sup>	3.3, 5, 9, 12, 15, 24	12/12	42/42	75-80	68/68
R1DA-xx1515 <sup>(3,4)</sup>	3.3, 5, 9, 12, 15, 24	15/15	33/33	75-82	68/68



#### 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 and is defined as the capacitive load that will allow start up in under 1s without damage to the converter

### Model Numbering



#### Notes:

- Note3: standard part is without continuous short circuit protection add suffix „/P“ for continuous short circuit protection  
 Note4: add suffix „-R“ for tape and reel packaging

#### Ordering Examples:

- R1DA-050505/P = Dual Output, 5Vin, 5/5Vout and with continuous short circuit protection  
 R1DA-050505-R = Dual Output, 5Vin, 5/5Vout and tape and reel packaging  
 R1DA-120505/P-R = Dual Output, 5Vin, 5/5Vout with continuous short circuit protection and tape and reel packaging

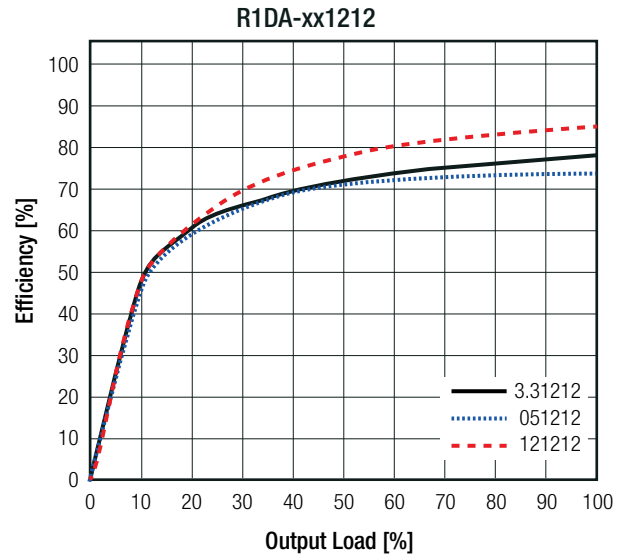
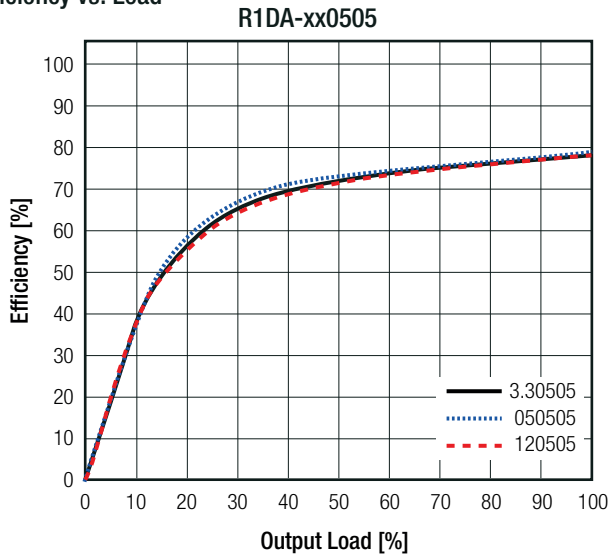
UL60950-1 certified  
 CAN/CSA-C22.2 No. 60950-1-07 certified  
 IEC/EN60950-1 certified  
 EN55032 compliant

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

**BASIC CHARACTERISTICS**

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load		0%		
Internal Operating Frequency		20kHz	50kHz	90kHz
Output Ripple and Noise	20MHz BW		50mVp-p	100mVp-p

**Efficiency vs. Load**



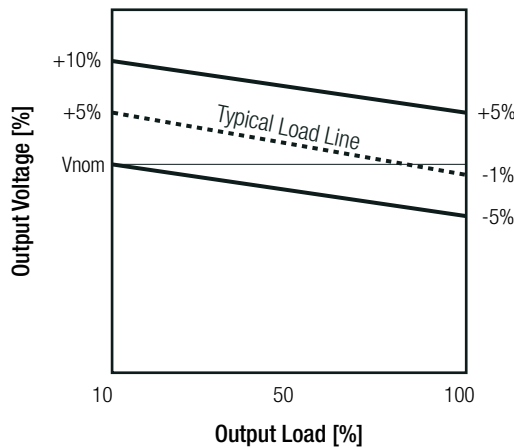
**REGULATIONS**

Parameter	Condition	Value	
Output Accuracy		-1.0% typ. / ±5.0% max.	
Line Regulation	low line to high line, full load	1.0% typ.	
Load Regulation <sup>(5)</sup>	10% to 100% load	3.3Vout	15.0% typ. / 20.0% max.
		5Vout	12.0% typ. / 15.0% max.
		9Vout	7.0% typ. / 10.0% max.
		12, 15Vout	6.0% typ. / 10.0% max.

**Notes:**

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

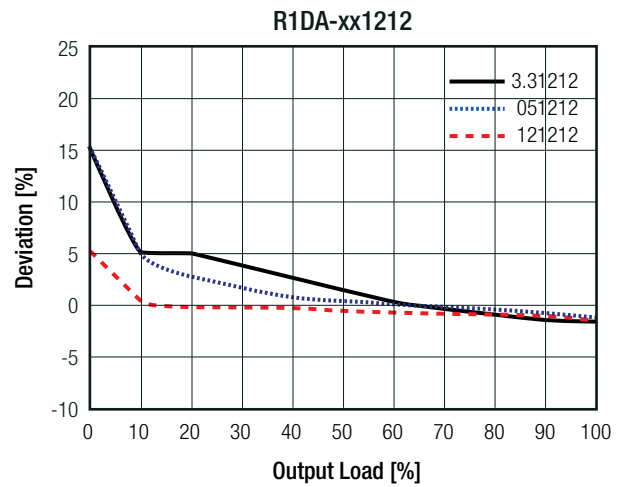
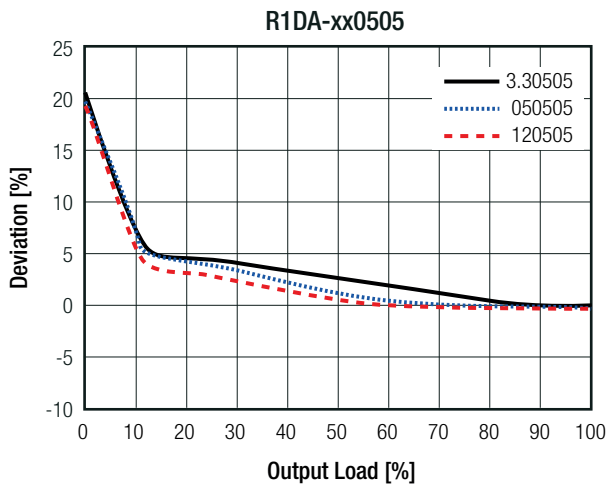
**Tolerance Envelope**



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

Deviation vs. Load



**PROTECTIONS**

Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ	without suffix with suffix "/P"	1 second continuous
Isolation Voltage <sup>(7)</sup>	I/P to O/P	tested for 1 second rated for 1 minute	1kVDC 500VAC/60Hz
Isolation Resistance	Viso =500V		10GΩ min.
Isolation Capacitance			75pF 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**

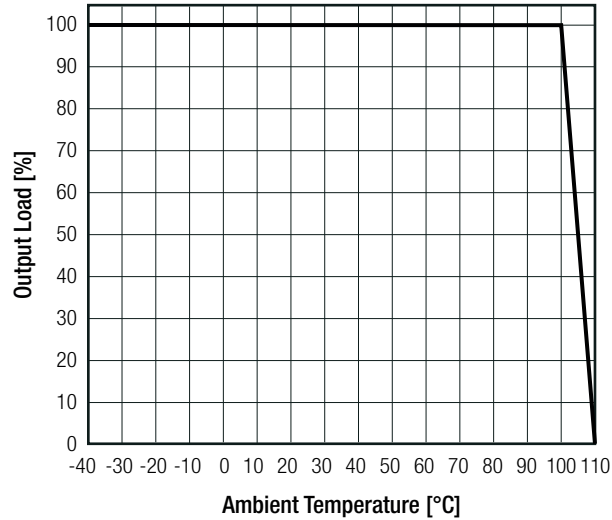
Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection, refer to „Derating Graph“		-40°C to +100°C
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	1045 x 10 <sup>3</sup> hours
		+85°C	183 x 10 <sup>3</sup> hours

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

#### Derating Graph

(@ Chamber and free air convection)

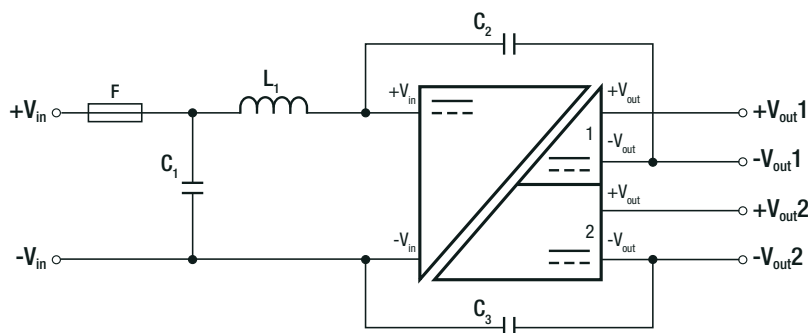


#### SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E358085-A2-UL	UL60950-1, 2nd Edition:2007 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition:2007
Information Technology Equipment, General Requirements for Safety	LVD1605077-08	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance	WD-SE-R-180674-A0	IEC60601-1:2005 + A1:2012, 3rd Edition EN60601-1:2006 + A12:2014
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS2		RoHS-2011/65/EU + AM-2015/863

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

#### EMC Filtering Suggestions according to EN55032



#### Component List Class B

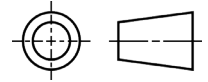
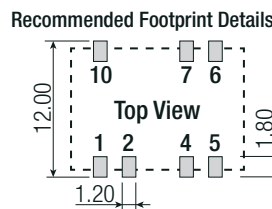
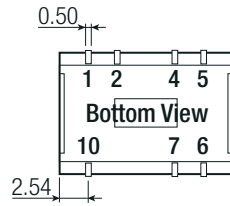
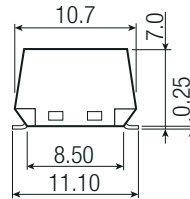
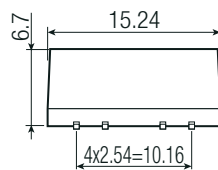
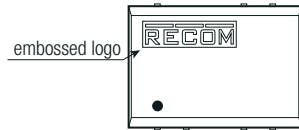
nom. $V_{in}$	C1	C3	C4	L1
3.3, 5VDC	2.2 $\mu\text{F}$ MLCC	470pF/2kVDC	470pF/2kVDC	4.7 $\mu\text{H}$ SMD Inductor
9, 12, 15VDC				10 $\mu\text{H}$ SMD Inductor
24VDC				22 $\mu\text{H}$ SMD Inductor
nom. $V_{in}$ with suffix „/P“	C1	C3	C4	L1
3.3, 5, 9, 12VDC	4.7 $\mu\text{F}$ MLCC	470pF/2kVDC	470pF/2kVDC	10 $\mu\text{H}$ SMD Inductor
15VDC				22 $\mu\text{H}$ SMD Inductor

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

**DIMENSION AND PHYSICAL CHARACTERISTICS**

Parameter	Type	Value
Material	case	non-conductive black plastic, (UL94 V-0)
Dimension (LxWxH)		15.24 x 10.7 x 6.7mm
Weight		1.2g typ.

**Dimension Drawing (mm)**



**Pinning Information**

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

NC = No Connection  
Tolerance:  
xx.x= ±0.5mm  
xx.xx= 0.25mm



**PACKAGING INFORMATION**

Packaging Dimension (LxWxH)	tube tape and reel (carton)	530.0 x 17.0 x 14.0mm 355.0 x 342.0 x 36.0mm
Packaging Quantity	tube tape and reel	33pcs 500pcs
Tape Width		24.0mm
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.

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