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

RECOM
DC/DC Converter

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

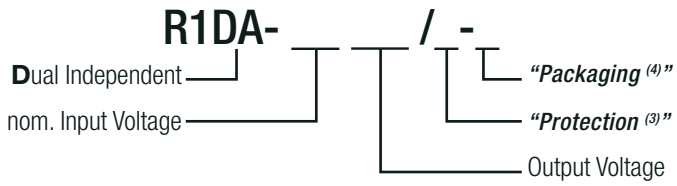
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ.(1) [%]	max. Capacitive Load (2) [µF]
R1DA-xx3.33.3 (3,4)	3.3, 5, 9, 12, 15, 24	3.3/3.3	150/150	75	470/470
R1DA-xx0505 (3,4)	3.3, 5, 9, 12, 15, 24	5/5	100/100	72-78	470/470
R1DA-xx0909 (3,4)	3.3, 5, 9, 12, 15,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



E358085

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

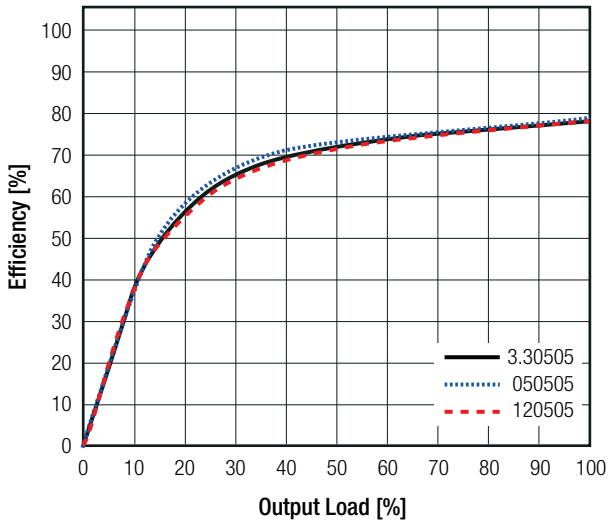
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

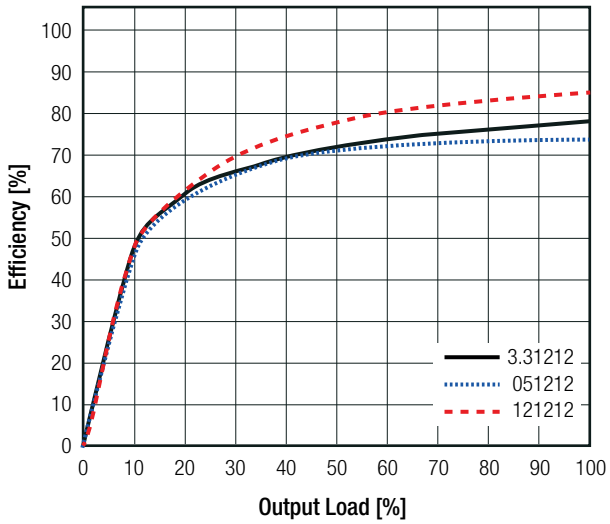
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range			±10%	
Minimum Load		0%		
Internal Operating Frequency		20kHz	50kHz	90kHz
Output Ripple and Noise	20MHz BW		50mVp-p	100mVp-p

Efficiency vs. Load

R1DA-xx0505



R1DA-xx1212



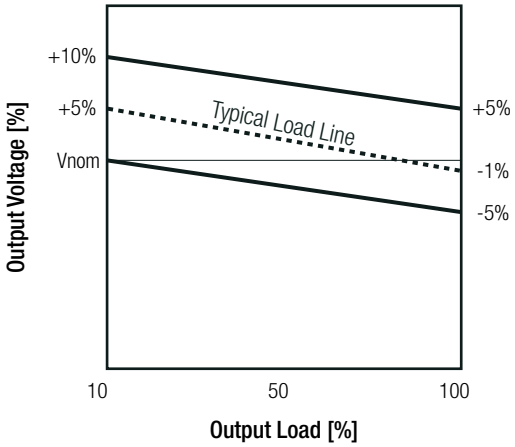
REGULATIONS

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 (5)	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

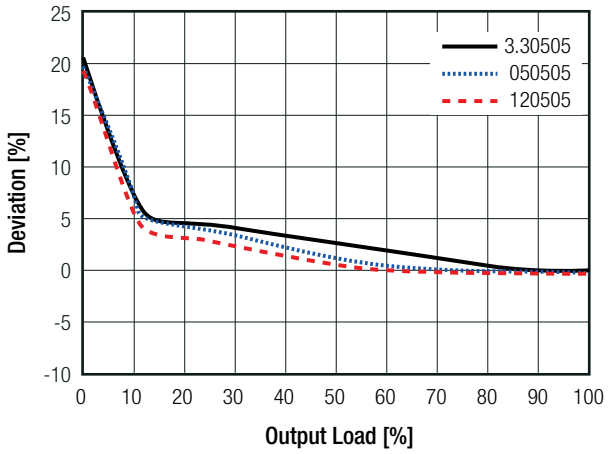


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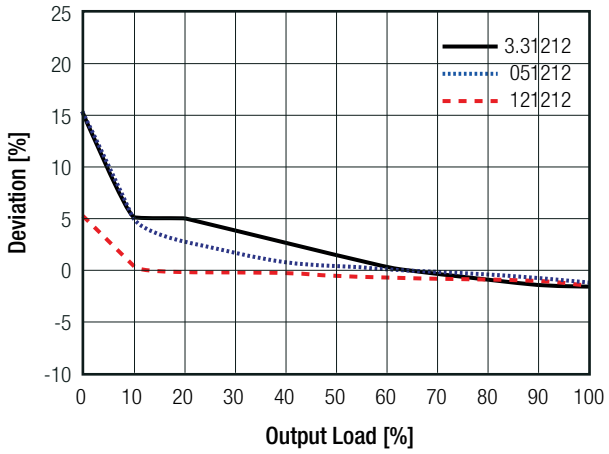
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Deviation vs. Load

R1DA-xx0505



R1DA-xx1212



PROTECTIONS			
Parameter	**Type**		**Value**
Short Circuit Protection (SCP)	below 100mΩ	without suffix with suffix "/P"	1 second continuous
Isolation Voltage (7)	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

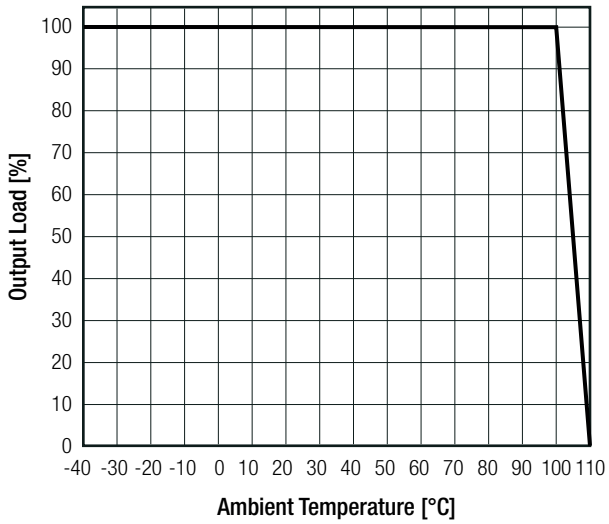
Note8: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

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 +85°C	1045 x 10^3 hours 183 x 10^3 hours

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

Derating Graph
(@ Chamber and free air convection)

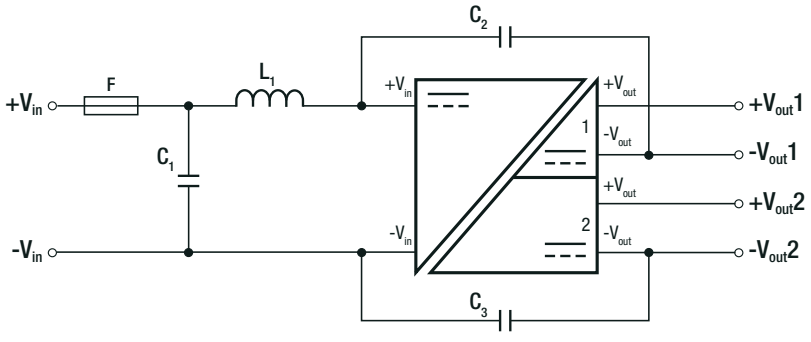


SAFETY AND CERTIFICATIONS

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. Vin	C1	C3	C4	L1
3.3, 5VDC	2.2µF MLCC	470pF/2kVDC	470pF/2kVDC	4.7µH SMD Inductor
9, 12, 15VDC				10µH SMD Inductor
24VDC				22µH SMD Inductor

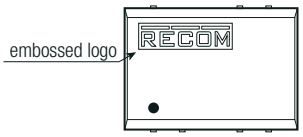
nom. Vin with suffix „/P“	C1	C3	C4	L1
3.3, 5, 9, 12VDC	4.7µF MLCC	470pF/2kVDC	470pF/2kVDC	10µH SMD Inductor
15VDC				22µH SMD Inductor

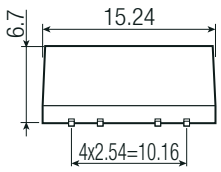
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

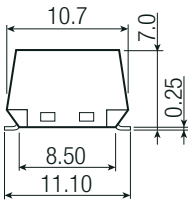
DIMENSION AND PHYSICAL CHARACTERISTICS

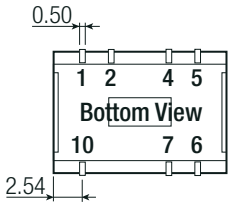
Parameter	Type	Value
Material	case	non-conductive black plastic, (UL94 V-0)
Dimension (LxWxH)		15.24 x 10.7 x 6.7mm
Weight		1.2g typ.

Dimension Drawing (mm)

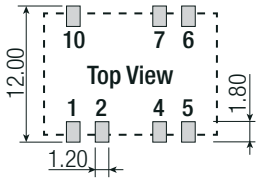


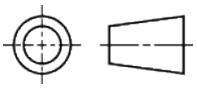






Recommended Footprint Details





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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