

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 preppacked 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 |

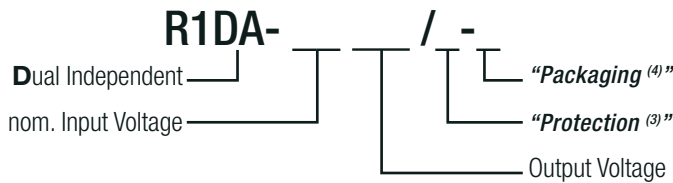


Notes:

- 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

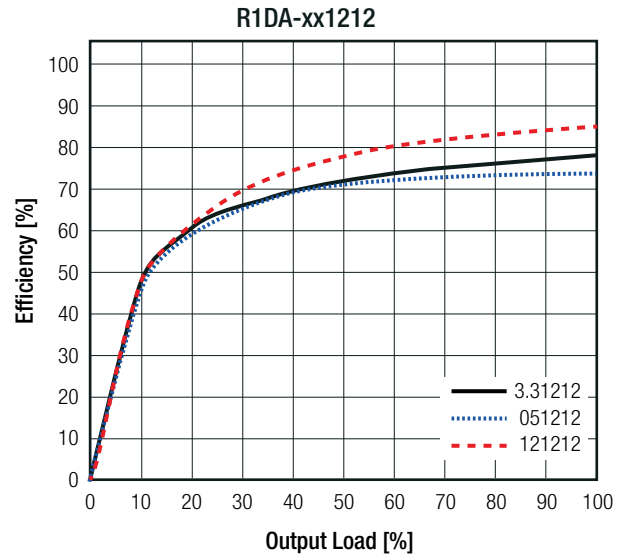
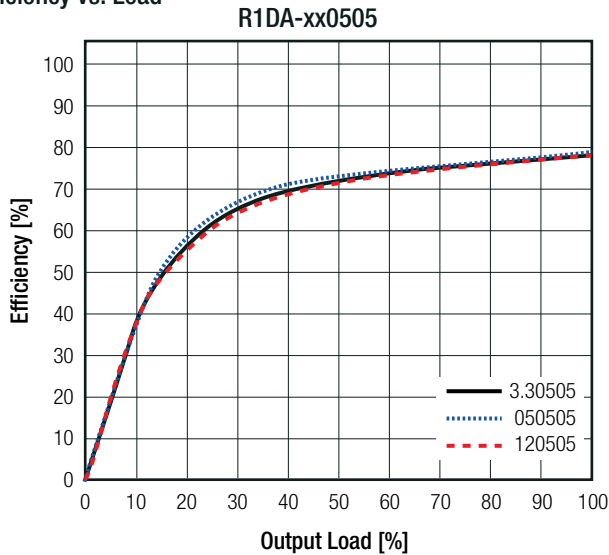
UL60950-1 certified
 CAN/CSA-C22.2 No. 60950-1-07 certified
 IEC/EN60950-1 certified
 EN55032 compliant

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



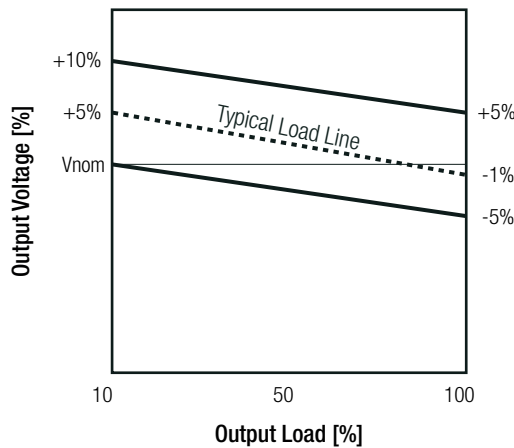
REGULATIONS

| 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 ⁽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

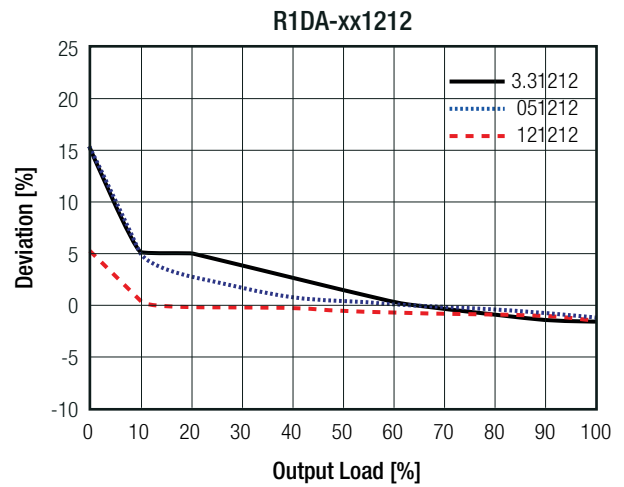
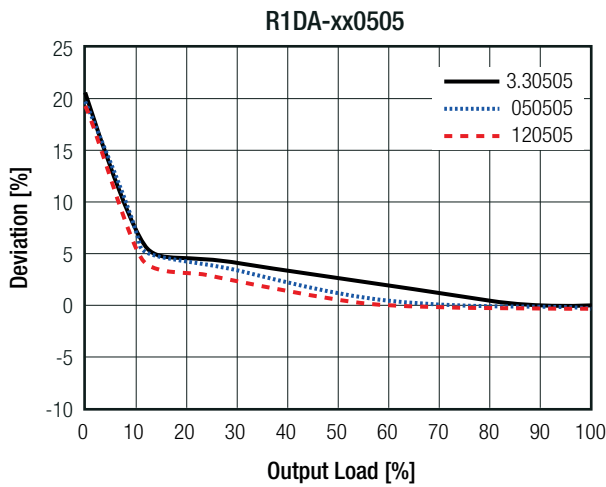
Tolerance Envelope



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

Deviation vs. Load



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

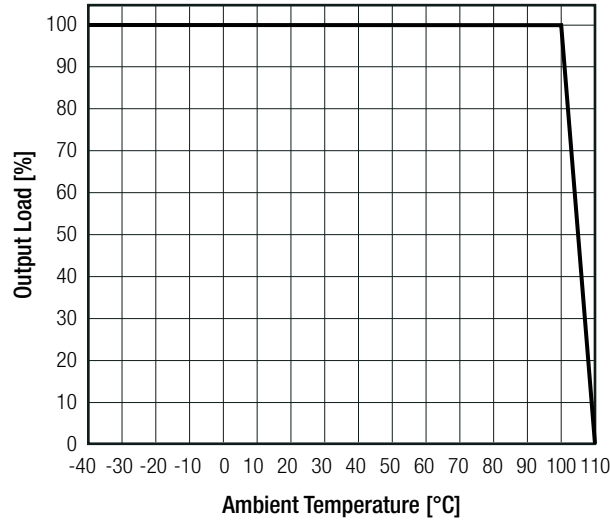
| Parameter | Condition | | Value |
|-----------------------------|--|-------|------------------------------|
| Operating Temperature Range | full load @ free air convection, refer to „Derating Graph“ | | -40°C to +100°C |
| Operating Altitude | | | 2000m |
| Operating Humidity | non-condensing | | 95%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

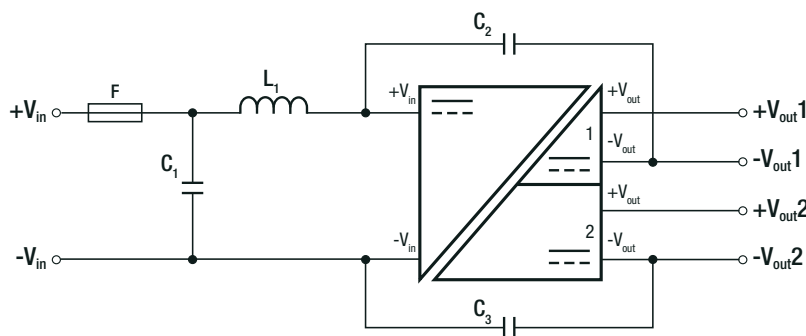


SAFETY AND CERTIFICATIONS

| 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

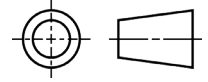
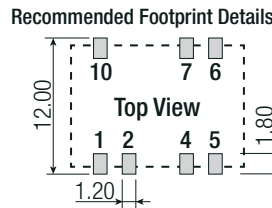
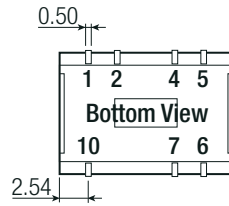
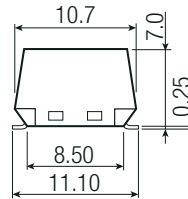
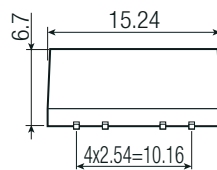
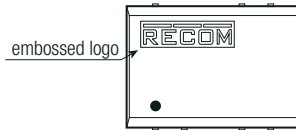
| nom. V_{in} | C1 | C3 | C4 | L1 |
|--------------------------------|------------------------|-------------|-------------|--------------------------------|
| 3.3, 5VDC | 2.2 μF MLCC | 470pF/2kVDC | 470pF/2kVDC | 4.7 μH SMD Inductor |
| 9, 12, 15VDC | | | | 10 μH SMD Inductor |
| 24VDC | | | | 22 μH SMD Inductor |
| nom. V_{in} with suffix „/P“ | C1 | C3 | C4 | L1 |
| 3.3, 5, 9, 12VDC | 4.7 μF MLCC | 470pF/2kVDC | 470pF/2kVDC | 10 μH SMD Inductor |
| 15VDC | | | | 22 μH 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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