

Features

Unregulated Converters

- 1W Power in SMD package
- Pin compatible with R1D series
- -40°C to +95°C operating temperature @ full load
- High 3kVDC/1 second or 1kVDC/1 second isolation
- IEC/EN/UL62368-1 certified, CB Report
- 5000m operation

Description

Low cost, low profile, open-frame 1W SMD isolated DC/DC dual output converters. The R1DX operates from 5V and offers ± 5 , ± 9 , ± 12 or ± 15 dual outputs. There is no minimum load requirement and the quiescent consumption is less than 150mW. Standard isolation is 1kVDC/1s and a /H version with 3kVDC/1s is available. The operating temperature is from -40°C up to +95°C without derating. The pin-out is industry standard and compatible with the R1D series, but at half the height. The converters are fully certified to IEC/EN/UL62368 and IEC/EN/UL60950 and are 10/10 RoHS-conform. Class A EMC conformity requires only an input capacitor and a simple low cost LC filter is all that is needed for Class B EMC.

Selection Guide

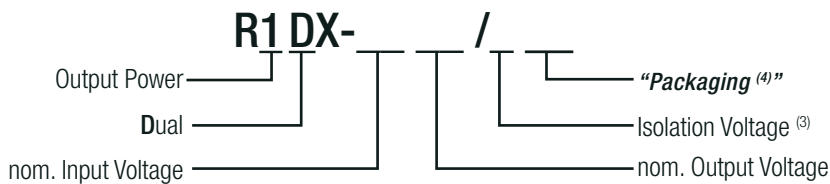
Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. ⁽¹⁾ [%]	max. Capacitive Load ⁽²⁾ [μ F]
R1DX-0505	5	± 5	± 100	78	± 1000
R1DX-0509	5	± 9	± 56	78	± 470
R1DX-0512	5	± 12	± 42	80	± 220
R1DX-0515	5	± 15	± 33	80	± 220

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

Model Numbering



Notes:

Note3: without suffix, standard isolation voltage (1kVDC/1 second)
with suffix „/H“, high isolation voltage (3kVDC/1 second)

Note4: with suffix „-R“, standard packaging Tape and Reel
with suffix „-Tray“ for optional tray packaging

Ordering Examples:

R1DX-0505-R	5Vin	± 5 Vout	1kVDC/1 second isolation	tape and reel packaging
R1DX-0515/H-Tray	5Vin	± 15 Vout	3kVDC/1 second isolation	tray packaging

RECOM
DC/DC Converter

R1DX

**1 Watt
SMD
Dual Output**



CULUS
E224736

IEC/EN62368-1 certified
UL62368-1 certified
IEC/EN60950-1 certified
C22.2 No. 62368-1-14 certified
CB Report
EN55032 compliant
EN55024 compliant

Specifications (measured @ Ta= 25°C, nominal input voltage, full load unless otherwise specified)

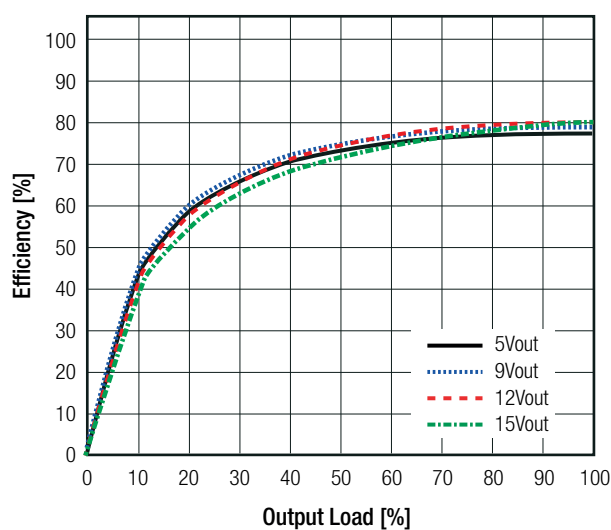
BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				capacitor
Input Voltage Range			±10.0%	
Quiescent Current				40mA
Minimum Load		0%		
Internal Operating Frequency		20kHz	60kHz	100kHz
Output Ripple and Noise ⁽⁵⁾	20MHz BW			100mVp-p

Notes:

Note5: Measurements are made with a 0.1µF MLCC across output (low ESR)

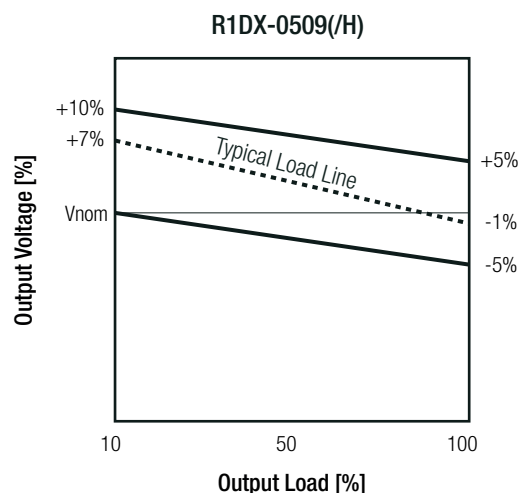
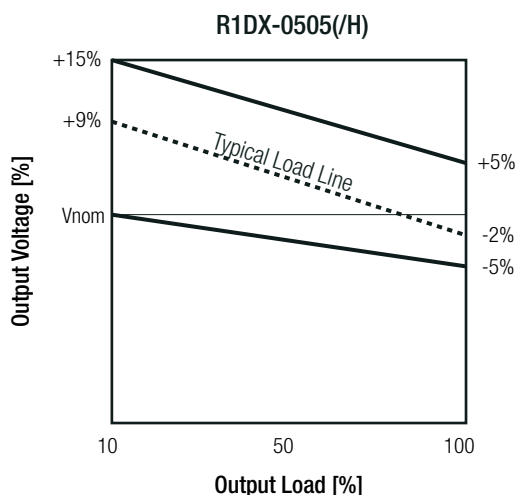
Efficiency vs. Load



REGULATIONS

Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line		±1.2% typ. at ±1.0% of Vin typ.
Load Regulation	10% to 100% load	±5Vout	10.0% typ. / 15.0% max.
		all others	8.0% typ. / 10.0% max.
Cross Regulation			±6.5% max.

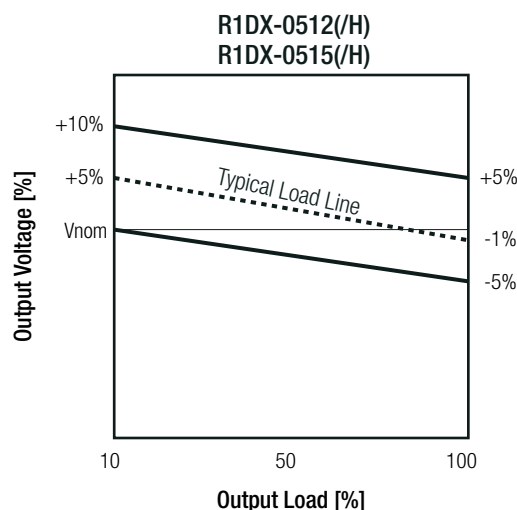
Tolerance Envelope



continued on next page

Specifications (measured @ $T_a = 25^\circ\text{C}$, nominal input voltage, full load unless otherwise specified)

Tolerance Envelope



PROTECTIONS

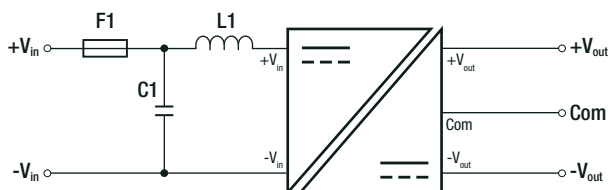
Parameter	Type			Value
Isolation Voltage	I/P to O/P	standard	tested for 1 second rated for 1 minute ⁽⁶⁾	1kVDC 500VAC
		with suffix "/H"	tested for 1 second rated for 1 minute ⁽⁶⁾	3kVDC 1.5kVAC
Isolation Resistance				10GΩ min.
Isolation Capacitance				100pF max.
Leakage Current	standard			1μA max.
	with suffix "/H"			3μA max.
Insulation Grade				functional

Notes:

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note7: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

Protection Circuit



ENVIRONMENTAL

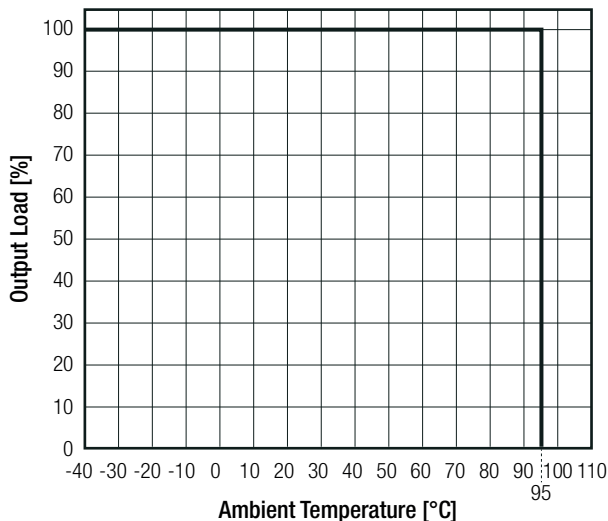
Parameter	Condition		Value
Operating Temperature Range	@ natural convection and full load (refer to derating graph)		-40°C to +95°C
Operating Altitude			5000m
Operating Humidity	non-condensing		5% - 95% RH max.
Pollution Degree			PD2
Vibration			according to MIL-STD-202G
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	20900 x 10 ³ hours
		+95°C	7200 x 10 ³ hours

continued on next page

Specifications (measured @ Ta= 25°C, nominal input voltage, full load unless otherwise specified)

Derating Graph

(@ Chamber and natural convection 0.1m/s)



SAFETY AND CERTIFICATIONS

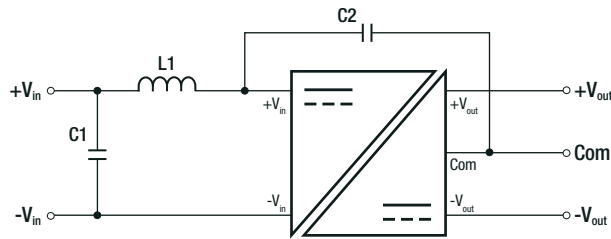
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E224736	UL60950-1, 2nd Edition 2014 CAN/CSA C22.2 No. 60950-1-07, 2nd Edition 2014
Information Technology Equipment, General Requirements for Safety (CB Scheme)	E224736-4788277362-2	IEC60950-1:2005 2nd Edition + A2:2013
Information Technology Equipment, General Requirements for Safety		EN60950-1:2006 + A2:2013
Audio/video, information and communication technology equipment - Safety requirements (LVD)	E224736	UL62368, 2nd Edition, 2014 CAN/CSA -C22.2 No. 62368-1-14, 2nd Edition, 2014
Audio/video, information and communication technology equipment - Safety requirements	E224736-4788277362-1	EN62368-1:2014 + A11:2017
Audio/video, information and communication technology equipment - Safety requirements (CB Scheme)		IEC62368-1:2014 2nd Edition
RoHS2+		RoHS 2011/65/EU + AM2015/863

EMC Compliance	Condition	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	with external filter (see filter suggestion)	EN55032:2015, Class A and B
Information technology equipment - Immunity characteristics Limits and methods of measurement		EN55024:2010 +A1:2015
ESD Electrostatic discharge immunity test	Air: ±2, 4, 6, 8kV Contact: ±2, 4kV	IEC61000-4-2:2008, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3 V/m	IEC61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	±0.5kV	IEC61000-4-4:2012, Criteria A
Surge Immunity	±0.5kV	IEC61000-4-5:2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	3V r.m.s.	IEC61000-4-6:2013, Criteria A
Power Magnetic Field Immunity	50Hz / 1A/m	IEC61000-4-8:2009, Criteria A

continued on next page

Specifications (measured @ Ta= 25°C, nominal input voltage, full load unless otherwise specified)

EMC Filtering Suggestions for EN55032



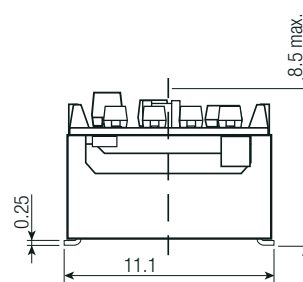
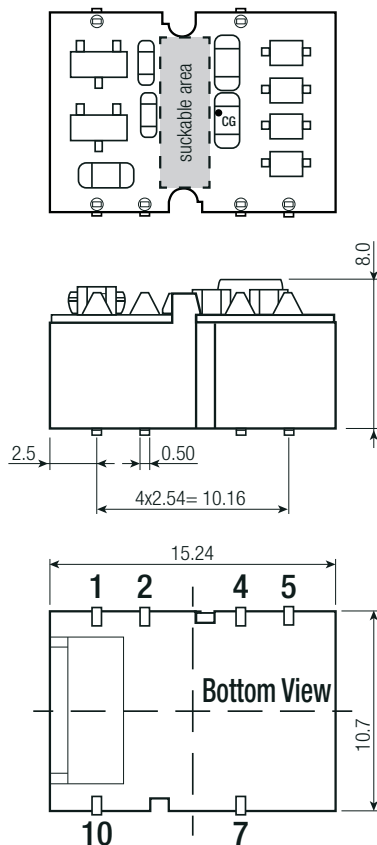
Component List Class A		
C1	C2	L1
4.7μF MLCC	470pF/4kVDC	10μH SMD Inductor

Component List Class B		
C1	C2	L1
10μF MLCC	470pF/4kVDC	10μH SMD Inductor

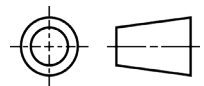
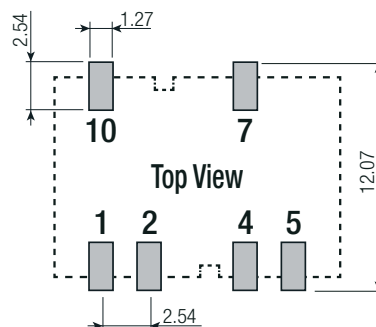
DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case PCB	black plastic (UL94V-0) FR4 (UL94V-0)
Dimension (LxWxH)		15.24 x 11.10 x 8.00mm
Weight		1.2g typ.

Dimension Drawing (mm)



Recommended Footprint Details



Pin Connection

Pin #	Dual
1	-Vin
2	+Vin
4	Com
5	-Vout
7	+Vout
10	NC

CG= center of gravity

NC= no connection

Tolerance: xx.x= ±0.5mm

xx.xx= ±0.25mm

Pin

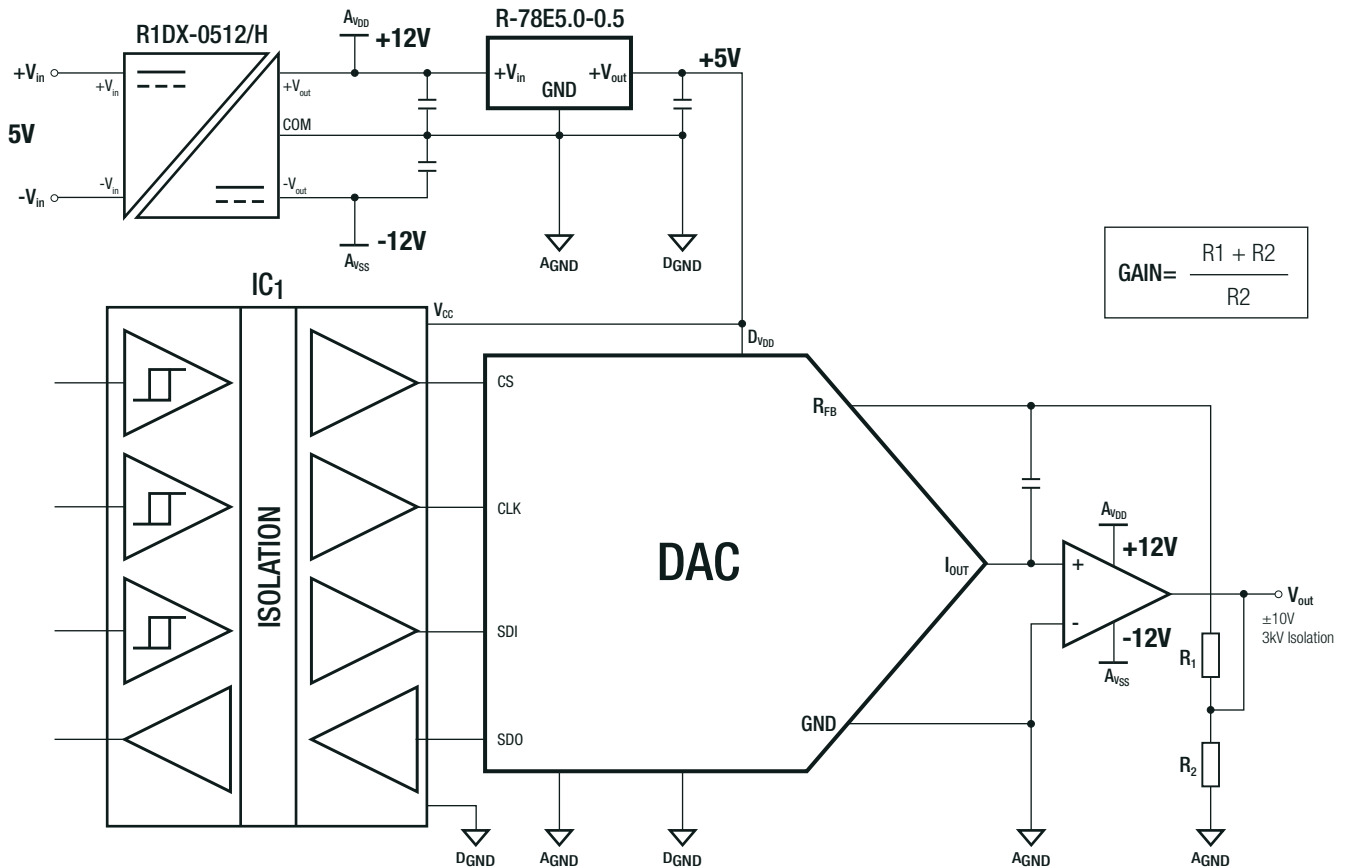
Thickness: ±0.05mm

Length: +0.25/-0.50mm

Specifications (measured @ Ta= 25°C, nominal input voltage, full load unless otherwise specified)

INSTALLATION and APPLICATION

Isolated DAC (±10VDC)



PACKAGING INFORMATION

Packaging Dimension (LxWxH)	tape and reel (carton)	355.0 x 340.0 x 35.0mm
	reel	330.2 x 330.2 x 30.0mm
	tray	260.0 x 205.0 x 27.0mm
Packaging Quantity	tape and reel	250pcs
	tray	30pcs
Tape Width		24.0mm
Storage Temperature Range	non-condensing	-55°C to +125°C
Storage Humidity		5% - 95% RH max.

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.