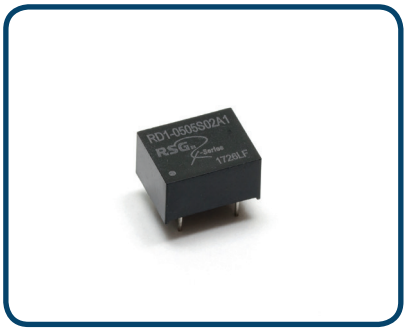
RD1-E10

1 W Unregulated Dual Separate Output DC / DC Converter

- **8 Pin DIL Package**
- **± 10 % Input Range**
- **1000 or 3000 VDC Isolation**
- **EMI Complies with EN55032 Class B**
- **Efficiency up to 83 %**
- **Operating Temperature Range: – 40°C ~ + 85°C**
- **Optional Continuous Short Circuit Protection On Request**
- **Low Ripple and Noise**
- **Non Conductive Black Plastic Case**

Picture similar



CE
RoHS

Output Specifications	
Voltage Accuracy	± 3 %, max.
Maximum Output Current	See table
Line Regulation	± 1.2 % max. (per ± 1 % V_{in} Change)
Load Regulation	From 20 % to 100 % Load: ± 10 % max. Output 3.3 V Model: ± 15 %
Cross Regulation (Dual Output)	–
Short Circuit Protection	Optional Continuous SCP on request
Ripple & Noise (20 MHz Bandwidth)	100 mV pk-pk
Temperature Coefficient	± 0.02 % / °C

Input Specifications	
Voltage Range	See table
Start-up Time	–
No-Load/Full-Load Input Current	See table
Input Filter	C / L (see filter details on following pages)
Input Reflected Ripple Current	20 mA pk-pk typ.
Surge Voltage (100 ms) [1]	
3.3 V Models 5 V Models 12 V Models 15 V Models 24 V Models	5 VDC max. 7 VDC max. 15 VDC max. 18 VDC max. 28 VDC max.

General Specifications	
I / O Isolation Voltage (60 sec)	1000 ~ 3000 VDC, In / Out1, In / Out2
Out1/Out2 Isolation Voltage (Dual Separate)	1000 VDC
I / O Isolation Capacitance	60 pF typ.
I / O Isolation Resistance	1000 MΩ, min.
Switching Frequency	Variable 80 kHz
Humidity	95 % rel H
Reliability Calculated MTBF	> 1.121 MHrs (MIL-HDBK-217 f)
Safety Standard(s)	IEC / EN62368-1 (designed to meet)

Environmental Specifications	
Operating Temperature Range	– 40 °C ~ + 85 °C (see Derating Curve)
Maximum Case Temperature	100 °C
Storage Temperature	– 40 °C ~ + 125 °C
Cooling	Natural Convection
Soldering Profile and Peak Temperature	Wave Flow: 260 °C (1.5 mm from case), 10 s, max.

Physical Specifications	
Case Material	Non-conductive Black Plastic (UL94V-0 rated)
Pin Material SIP Case	–
Pin Material DIP Case	0.5 mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight SIP Case	–
Weight DIP Case	1.8 g
Dimensions SIP Case	–
Dimensions DIP Case	0.50" x 0.40" x 0.27"

EMC Specifications	
Radiated / Conducted Emissions	EN55032 Class B see EMI Filter
ESD	IEC 61000-4-2 Perf. Criteria A
Rad. RF	IEC 61000-4-3 Perf. Criteria A
EFT	IEC 61000-4-4 Perf. Criteria A
Surge	IEC 61000-4-5 Perf. Criteria A
Cond. RF	IEC 61000-4-6 Perf. Criteria A
PFMF	IEC 61000-4-8 Perf. Criteria A
VD / SI / VV	–

[1] These are stress ratings; exposure of devices to any of these conditions may adversely affect long-term reliability.
All specifications typical at T_a = 25 °C, nominal input voltage and full load, unless otherwise specified.
The information and specification contained in this data sheet are believed to be correct at time of publication. However, Acal BFi accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.

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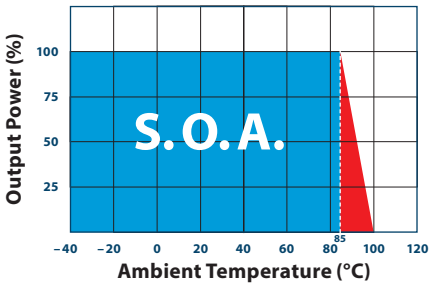
Number structure RS1 / RD1 Series

RS1	–	05	15	S	10	A	3
Name / package		**V-input nom.**	**V-output**	**Output type**	**Power**	**Int. Code**	**Isolation**
RS1 = SIL4 RD1 = DIL8		03 = 3.3 V 05 = 5 V … 48 = 48 V	03 = 3.3 V 05 = 5 V … 24 = 24 V	S = Single D = Dual* E = Separate*	02 = 0.25 W 05 = 0.50 W … 30 = 3.00 W	Logistics Code	1 = 1.0 kVDC 3 = 3.0 kVDC

(*RD1 only)

Temperature Derating Curve



Model Selection Guide

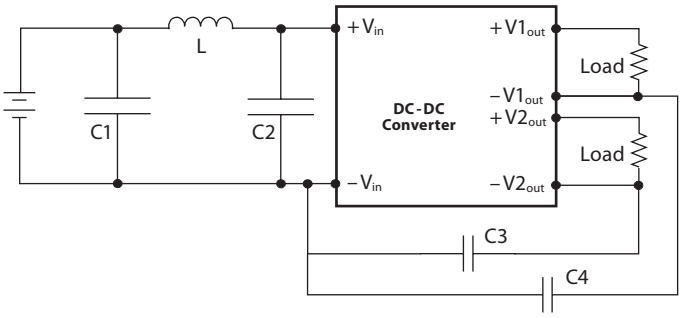
Suffix X = 1 means 1 kVDC and X = 3 means 3 kVDC Isolation Voltage

Model Number	Input			Output		Efficiency	Capacitor Load
	Voltage (VDC)	No-Load Current (mA)	Full Load Current (mA)	Voltage (VDC) Output 1 / Output 2	Full Load Current (mA) Output 1 / Output 2	@ Full Load (%)	(µF)
RD1-0303E10AX	3.3	20	399	3.3 / 3.3	152 / 152	76	100
RD1-0305E10AX	3.3	25	433	5 / 5	100 / 100	70	100
RD1-0307E10AX	3.3	25	433	7.2 / 7.2	69 / 69	70	100
RD1-0309E10AX	3.3	30	410	9 / 9	56 / 56	74	100
RD1-0312E10AX	3.3	38	478	12 / 12	50 / 50	76	100
RD1-0315E10AX	3.3	30	404	15 / 15	33 / 33	75	100
RD1-0503E10AX	5	15	299	3.3 / 3.3	152 / 152	67	100
RD1-0505E10AX	5	20	247	5 / 5	100 / 100	81	100
RD1-0507E10AX	5	16	260	7.2 / 7.2	69 / 69	77	100
RD1-0509E10AX	5	15	253	9 / 9	56 / 56	79	100
RD1-0512E10AX	5	20	300	12 / 12	50 / 50	80	100
RD1-0515E10AX	5	20	247	15 / 15	33 / 33	81	100
RD1-0518E10AX	5	20	247	18 / 18	28 / 28	81	100
RD1-0524E10AX	5	25	320	24 / 24	25 / 25	75	100
RD1-1203E10AX	12	15	111	3.3 / 3.3	152 / 152	75	100
RD1-1205E10AX	12	10	111	5 / 5	100 / 100	75	100
RD1-1207E10AX	12	10	107	7.2 / 7.2	69 / 69	78	100
RD1-1209E10AX	12	10	105	9 / 9	56 / 56	79	100
RD1-1212E10AX	12	15	125	12 / 12	50 / 50	80	100
RD1-1215E10AX	12	13	104	15 / 15	33 / 33	80	100
RD1-1218E10AX	12	20	107	18 / 18	28 / 28	78	100
RD1-1224E10AX	12	20	128	24 / 24	25 / 25	78	100
RD1-1503E10AX	15	20	89	3.3 / 3.3	152 / 152	75	100
RD1-1505E10AX	15	20	88	5 / 5	100 / 100	76	100
RD1-1507E10AX	15	20	88	7.2 / 7.2	69 / 69	76	100
RD1-1509E10AX	15	15	88	9 / 9	56 / 56	76	100
RD1-1512E10AX	15	15	107	12 / 12	50 / 50	75	100
RD1-1515E10AX	15	15	89	15 / 15	33 / 33	75	100
RD1-1518E10AX	15	20	87	18 / 18	28 / 28	77	100
RD1-1524E10AX	15	20	104	24 / 24	25 / 25	77	100
RD1-2403E10AX	24	5	53	3.3 / 3.3	152 / 152	79	100
RD1-2405E10AX	24	8	50	5 / 5	100 / 100	83	100
RD1-2407E10AX	24	5	53	7.2 / 7.2	69 / 69	78	100
RD1-2409E10AX	24	8	54	9 / 9	56 / 56	77	100
RD1-2412E10AX	24	6	63	12 / 12	50 / 50	80	100
RD1-2415E10AX	24	6	54	15 / 15	33 / 33	77	100
RD1-2418E10AX	24	13	56	18 / 18	28 / 28	74	100
RD1-2424E10AX	24	5	65	24 / 24	25 / 25	77	100

The models listed above are standard types. If you need special specifications or have questions regarding packing or need application support, please contact our specialists:
sales-de@acalbfi.de or +49 6074 4098-0

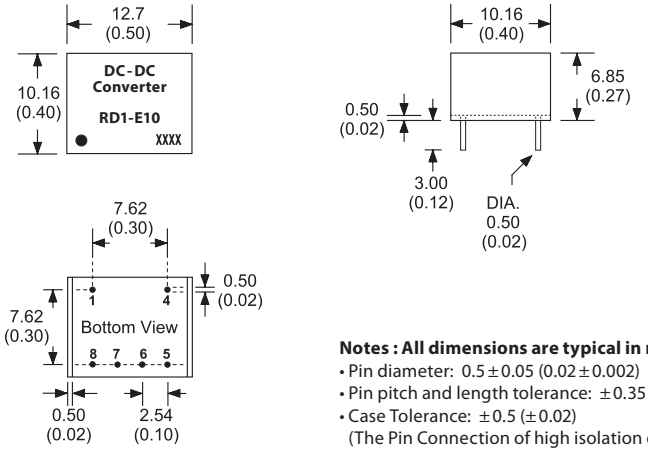
Test Configurations

EFT & Surge Test



V_{in}	C1	L	C2	C3	C4
3.3 V, 5 V, 12 V, 15 V	1210, 2.2 µF / 100 V	18 µH			
24 V	1210, 2.2 µF / 100 V	18 µH	1210, 2.2 µF/100 V	1206, 470 pF/2 kV	1206, 470 pF/2 kV

Mechanical Specifications



Pin Number	Dual Separate
1	–V Input
4	+V Input
5	+V1 Output
6	–V1 Output
7	+V2 Output
8	–V2 Output

Notes : All dimensions are typical in millimeters (inches).
- Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
- Pin pitch and length tolerance: ± 0.35 (± 0.014)
- Case Tolerance: ± 0.5 (± 0.02)
  (The Pin Connection of high isolation one is the same with normal one.)

Notes

- Ripple / Noise measured with 20 MHz bandwidth.
- Capacitive load is tested at minimal V_{in} and constant resistive load.
- Measured Input reflected ripple current with a simulated source inductance of 12 µH.
- Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
- Input filter components are required to help meet conducted emission class B. Refer to the EMI Filter of design & feature configuration.
- An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
  The suggested filter capacitor: Nippon - chemi - con KY series, 470 µF / 100 V.

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