RD5-RS/RD100W

10.0W Regulated Single & Dual Output DC/DC Converter

Picture similar

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- **16 Pin DIL Package**
- **Wide 4:1 Input Range**
- **1600VDC Isolation**
- **High Power Density**
- **Efficiency up to 87%**
- **Operating Temperature Range -40°C ~ +100°C**
- **Continuous Short Circuit Protection**
- **Over Load Protection, Under Voltage Lockout**
- **Black Copper Metal Case**
- **Adjustable Output Voltage**
- **EMI filter meets EN55032 class A**

Output Specifications	
Voltage Accuracy	±1%, max.
Output Voltage Adjustability (Trim)	Single Output: ±10% max.
Maximum Output Current	See table
Line Regulation	±0.5% max.
Load Regulation	from 0% to 100% Load: ± 1% max. –
Cross Regulation (Dual Output)	±5%
Over Voltage Protection	–
Over Current Protection	160% typ.
Short Circuit Protection	Indefinite (Automatic Recovery)
Ripple & Noise (20 MHz bandwidth)	60 ~ 80mV pk-pk max.
Temperature Coefficient	±0.02%/°C
Transient Recovery Time	250µs typ.
Transient Response Deviation	±3 ~ 5% max.

Input Specifications	
Voltage Range	See table
Start-up Time	20ms typ.
No-Load/Full-Load Input Current	See table
Input Filter	C/L (see filter details on following pages)
Input Reflected Ripple Current	20mA pk-pk typ.
Remote ON	–
Remote OFF	–
OFF Idle Current	–
Surge Voltage (100 ms) †)	
24V Models 48V Models	50VDC max. 100VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	1600VDC
Isolation Voltage Case/Input&Output	1000VDC
I/O Isolation Capacitance	1200pF typ.
I/O Isolation Resistance	1000M Ohm, min.
Switching Frequency	370kHz typ.
Humidity	95% rel H
Reliability Calculated MTBF	>485KHrs (MIL-HDBK-217 f)
Safety Standard(s)	IEC/EN62368-1 (designed to meet)

Environmental Specifications	
Operating Temperature Range	-40°C ~ +100°C (see Derating Curve)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C
Cooling	Natural Convection
Soldering Profile and Peak Temperature	Wave Flow: 260°C (1.5 mm from case), 10s, max.

Physical Specifications	
Case Material	Copper Black –
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	10.0g
Case Dimensions	0.94" x 0.54" x 0.41"

EMC Specifications	
Radiated / Conducted Emissions	EN55032 Class A 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	–

†) 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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Acal BFi Germany GmbH
Assar-Gabrielsson-Straße 1
63128 Dietzenbach, Germany

Tel. +49 6074 4098-0
Fax +49 6074 4098-777
vertrieb.rsg@acalbfi.de
www.rsg-electronic.com

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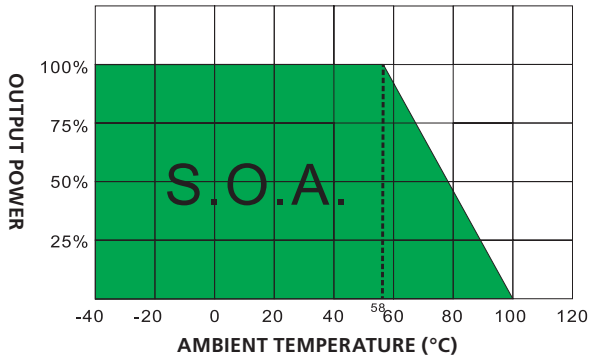
Number structure RD5

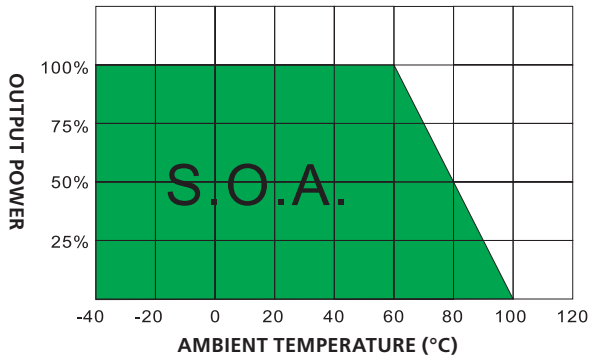
RD5	–	24	05	RS	100	A	1	(W)
Name / package		**V-input nom.**	**V-output**	**Output type**	**Power**	**Int. Code**	**Isolation**	**Wide-Input**
RD5 = DIL16		12 = 9 ~ 18 V 24 = 18 ~ 36 V or 9 ~ 36 V 48 = 36 ~ 75 V or 18 ~ 75 V	03 = 3.3 V 05 = 5 V … 24 = 24 V	RS = Reg.Single RD = Reg. Dual	10 = 1.0 W 20 = 2.0 W … 100 = 10.0 W	Logistics Code	1 = 1.6 kV DC	_ = 2:1 W = 4:1

Derating Curves

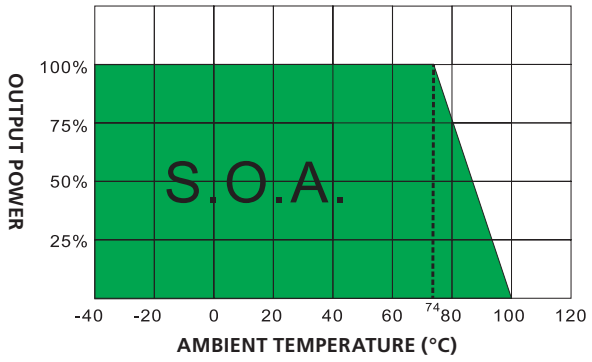
3.3 V_{out} Models



5.0 V_{out} Models



All other Models



Model Selection Guide

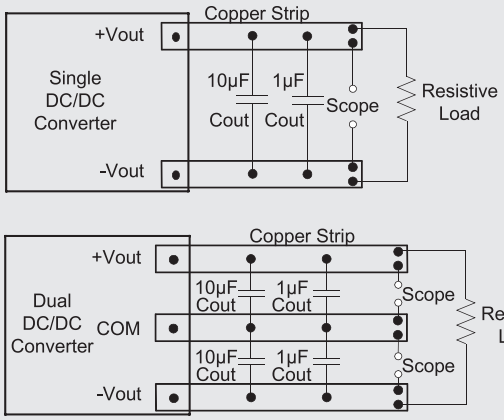
Model Number	Input	Input Current		Output	Output Current		Efficiency	Capacitor Load
	Voltage Range (VDC)	No-Load (mA, max.)	Full Load (mA, typ.)	Voltage (VDC)	Min. Load (mA)	Full Load (mA)	@Full Load (%, typ.)	@Full Load (µF, max.)
RD5-2403RS100A1W	24 (9 ~ 36)	10	464	3.3	0	2700	80	3300
RD5-2405RS100A1W	24 (9 ~ 36)	10	502	5	0	2000	83	2200
RD5-2412RS100A1W	24 (9 ~ 36)	10	479	12	0	833	87	1000
RD5-2415RS100A1W	24 (9 ~ 36)	10	479	15	0	666	87	680
RD5-2424RS100A1W	24 (9 ~ 36)	10	479	24	0	416	87	330
RD5-2412RD100A1W	24 (9 ~ 36)	10	478	±12	0	±416	87	±680
RD5-2415RD100A1W	24 (9 ~ 36)	10	478	±15	0	±333	87	±470
RD5-4803RS100A1W	48 (18 ~ 75)	7	232	3.3	0	2700	80	3300
RD5-4805RS100A1W	48 (18 ~ 75)	7	251	5	0	2000	83	2200
RD5-4812RS100A1W	48 (18 ~ 75)	7	239	12	0	833	87	1000
RD5-4815RS100A1W	48 (18 ~ 75)	7	239	15	0	666	87	680
RD5-4824RS100A1W	48 (18 ~ 75)	7	239	24	0	416	87	330
RD5-4812RD100A1W	48 (18 ~ 75)	7	239	±12	0	±416	87	±680
RD5-4815RD100A1W	48 (18 ~ 75)	7	239	±15	0	±333	87	±470

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@rsg-electronic.de or +49 6074 4098-0

Test Configurations

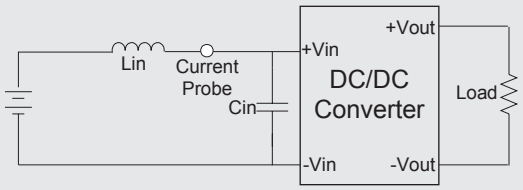
Output Ripple & Noise Measurement Test

To reduce ripple and noise, it's recommended to connect a 1 µF ceramic disk capacitor and a 10 µF electrolytic capacitor to output.



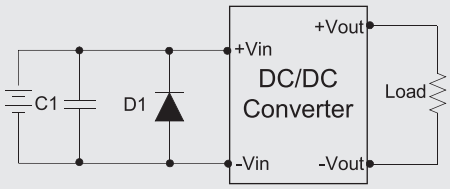
Input Reflected Ripple Current Test

Input reflected ripple current is measured with a source inductor L_{in} (8.2 µH) and a source capacitor C_{in} (47 µF, ESR < 1.0 Ω at 100 kHz) at nominal input and full load.



EFT & Surge Test

The suggested filter capapcitor:
24 V_{in} models: Nippon - chemi - con KY series, 220 µF/100 V and a TVS, 58 V, 3 kW
48 V_{in} models : Nippon - chemi - con KY series, 220 µF/100 V and a TVS, 120 V, 3 kW



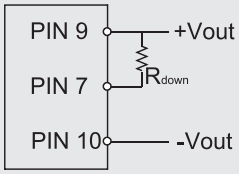
	C1	D1
24 V_{in} models	220 µF/100 V	TVS, 58 V, 3 kW
48 V_{in} models	220 µF/100 V	TVS, 120 V, 3 kW

Design Configurations

Output Voltage Adjustment (Single output models only)

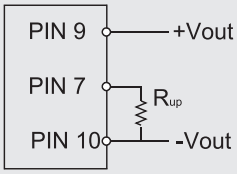
Pin 7 via a resistor to Pin 9 (+ V_{out}), V_o trim down.
Pin 7 via a resistor to Pin 10 (- V_{out}), V_o trim up.

DC/DC Converter



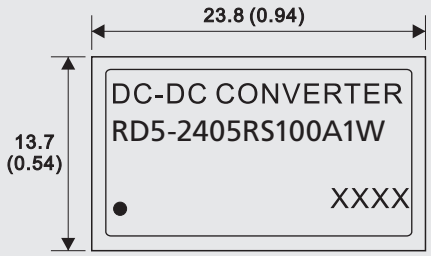
Trim down

DC/DC Converter

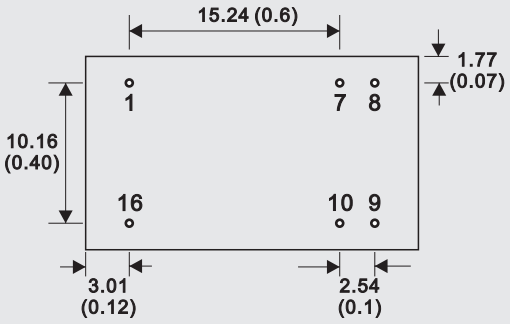


Trim up

Mechanical Specifications

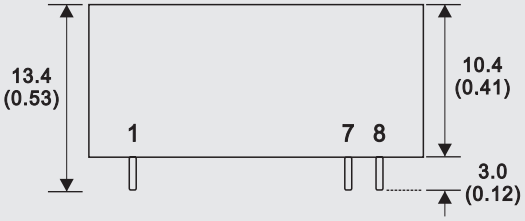


Top view



Bottom view

Pin Connections		
Pin Number	**Single**	**Dual**
1	–V Input	–V Input
7	Trim	N. C.
8	N. C.	Common
9	+V Output	+V Output
10	–V Output	–V Output
16	+V Input	+V Input



Side view (Front)

16 Pin DIL Package

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
3. Pin to case tolerance: ± 0.5 (± 0.02)
4. Case tolerance: ± 0.5 (± 0.02)

Note:
1. Cross regulation: one load is 25 % to 100 % load, the other load is 100 % load, the output voltage variable rate is within ± 5%.
2. Ripple/Noise measured with a 1 µF ceramic and a 10 µF electrolytic capacitor.
3. Capacitive load is tested at minimal V_{in} and constant resistive load.
4. Transient recovery and response are tested at normal V_{in} and 100 % ~ 25 % load, 25 % load step change.
5. Measured Input reflected ripple current with a simulated source inductance of 8.2 µH and a source capacitor C_{in} (47 µF, ESR < 1.0 Ω at 100 kHz).
6. An external filter is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
7. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
8. "Nature Convection" is usually about 30 ~ 65 LFM but is not equal to still air (0 LFM).

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Acal BFi Germany GmbH
Assar-Gabrielsson-Straße 1
63128 Dietzenbach, Germany

Tel. +49 6074 4098-0
Fax +49 6074 4098-777
vertrieb.rsg@acalbfi.de
www.rsg-electronic.com

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