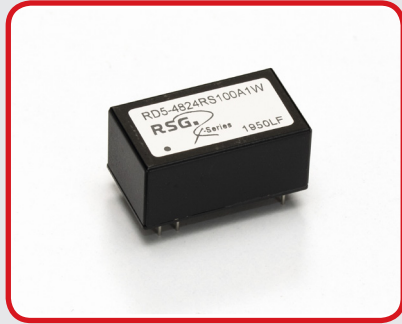


# RD5-RS/RD100W

10.0W Regulated Single & Dual Output DC/DC Converter



Picture similar



- 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
- 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
Capacitor Load	See table
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 Stand By Current	-
OFF Idle Current	-

## General Specifications

Efficiency	See table typ.
I/O Isolation Voltage (60 sec)	1600VDC
Isolation Voltage Metal 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/UL/EN60950-1, IEC/UL/EN62368-1 (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

## Physical Specifications

Case Material	Nickel-coated Copper
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"

## Absolute Maximum Ratings (1)

Input Surge Voltage (100 ms)	
24V Models	50VDC max.
48V Models	100VDC max.
Soldering Temperature (2)	260°C max.

## 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	-

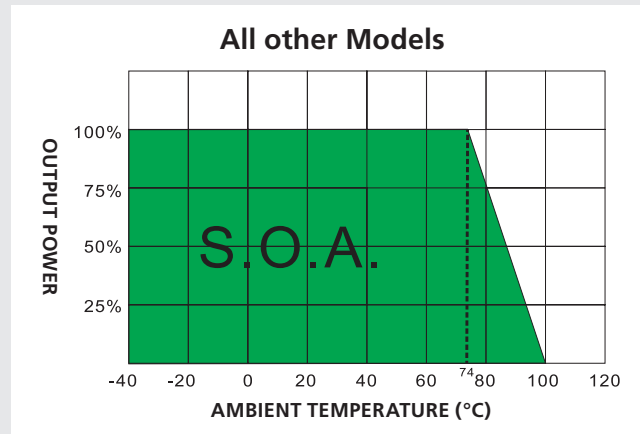
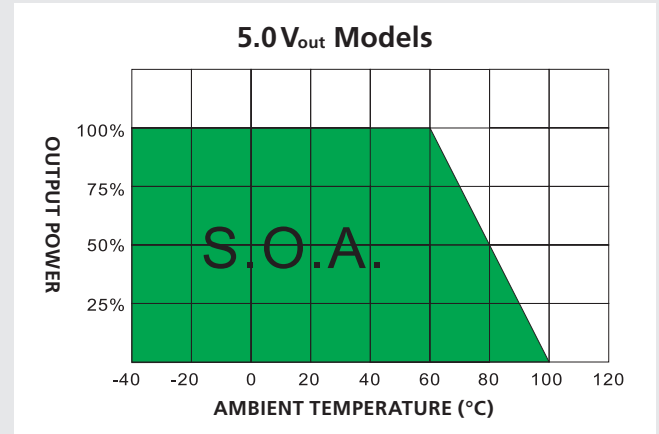
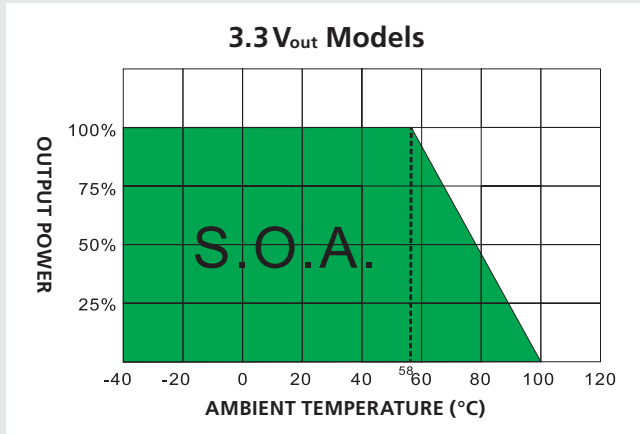
(1) These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability. (2) 1.5 mm from case 10 sec max. All specifications typical at TA = 25 °C, nominal input voltage and full load unless otherwise specified.

The information and specification contained in this data sheet are believed to be correct at time of publication. However RSG accepts no responsibility for consequences arising from printing errors or inaccuracies. **Specifications are subject to change without notice.**

## Number structure RD5

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

## Derating Curves



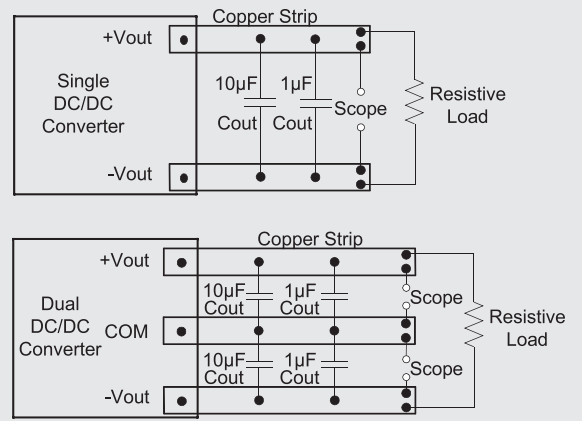
## Model Selection Guide

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @Full Load (%, typ.)	Capacitor Load @Full Load (µF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. Load (mA)	Full Load (mA)		
RD5-2403RS100A1W	24 (9~36)	10	464	3.3	0	1400	80	3300
RD5-2405RS100A1W	24 (9~36)	10	502	5	0	1200	83	2200
RD5-2412RS100A1W	24 (9~36)	10	479	12	0	500	87	1000
RD5-2415RS100A1W	24 (9~36)	10	479	15	0	400	87	680
RD5-2424RS100A1W	24 (9~36)	10	479	24	0	250	87	330
RD5-2412RD100A1W	24 (9~36)	10	478	±12	0	±909	87	±680
RD5-2415RD100A1W	24 (9~36)	10	478	±15	0	±600	87	±470
RD5-4803RS100A1W	48 (18~75)	7	232	3.3	0	±250	80	3300
RD5-4805RS100A1W	48 (18~75)	7	251	5	0	±200	83	2200
RD5-4812RS100A1W	48 (18~75)	7	239	12	0	±125	87	1000
RD5-4815RS100A1W	48 (18~75)	7	239	15	0	1400	87	680
RD5-4824RS100A1W	48 (18~75)	7	239	24	0	1200	87	330
RD5-4812RD100A1W	48 (18~75)	7	239	±12	0	500	87	±680
RD5-4815RD100A1W	48 (18~75)	7	239	±15	0	400	87	±470

## Test Configurations

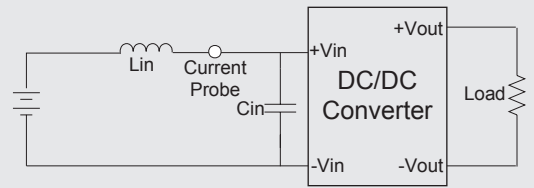
### Output Ripple & Noise Measurement Test

To reduce ripple and noise, it's recommended to connect a  $1\ \mu\text{F}$  ceramic disk capacitor and a  $10\ \mu\text{F}$  electrolytic capacitor to output.



### Input Reflected Ripple Current Test

Input reflected ripple current is measured with a source inductor  $L_{in}$  ( $8.2\ \mu\text{H}$ ) and a source capacitor  $C_{in}$  ( $47\ \mu\text{F}$ ,  $\text{ESR} < 1.0\ \Omega$  at  $100\ \text{kHz}$ ) at nominal input and full load.

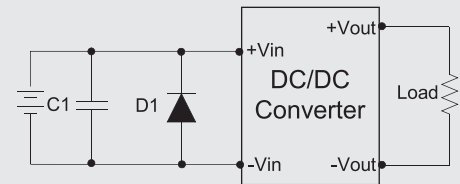


### EFT & Surge Test

The suggested filter capacitor:

$24\ \text{V}_{in}$  models: Nippon - chemi - con KY series,  $220\ \mu\text{F}/100\text{V}$  and a TVS,  $58\ \text{V}$ ,  $3\ \text{kW}$

$48\ \text{V}_{in}$  models: Nippon - chemi - con KY series,  $220\ \mu\text{F}/100\text{V}$  and a TVS,  $120\ \text{V}$ ,  $3\ \text{kW}$



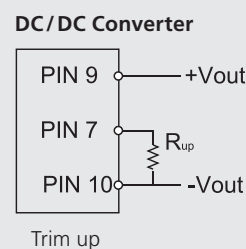
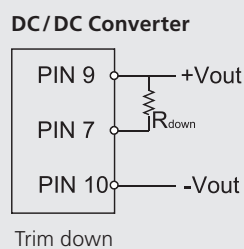
	C1	D1
$24\ \text{V}_{in}$ models	$220\ \mu\text{F}/100\text{V}$	TVS, $58\ \text{V}$ , $3\ \text{kW}$
$48\ \text{V}_{in}$ models	$220\ \mu\text{F}/100\text{V}$	TVS, $120\ \text{V}$ , $3\ \text{kW}$

## Design Configurations

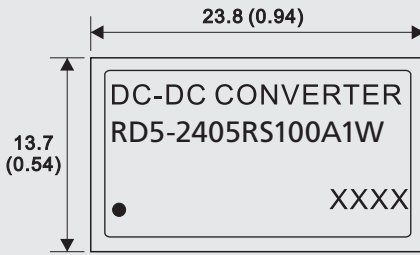
### Output Voltage Adjustment (Single output models only)

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

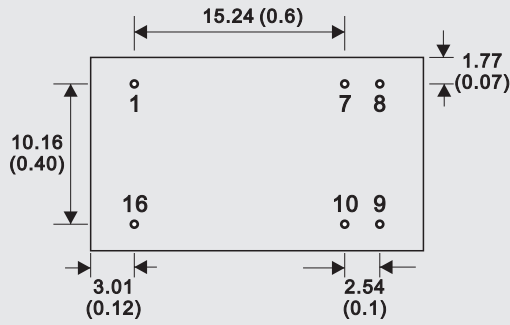
Pin 7 via a resistor to Pin 10 ( $-V_{out}$ ),  $V_o$  trim up.



## Mechanical Specifications

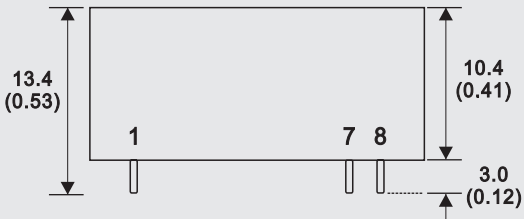


Top view



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:  $0.5 \pm 0.05$  ( $0.02 \pm 0.002$ )
2. Pin pitch and length tolerance:  $\pm 0.35$  ( $\pm 0.014$ )
3. Pin to case tolerance:  $\pm 0.5$  ( $\pm 0.02$ )
4. Case tolerance:  $\pm 0.5$  ( $\pm 0.02$ )

Note:

1. Cross regulation: one load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within  $\pm 5\%$ .
2. Ripple/Noise measured with a  $1\mu\text{F}$  ceramic and a  $10\mu\text{F}$  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  $8.2\mu\text{H}$  and a source capacitor  $C_{in}$  ( $47\mu\text{F}$ ,  $\text{ESR} < 1.0\Omega$  at 100kHz).
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).