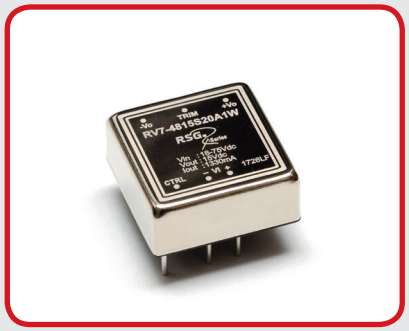
RV7-S/D30W

30W Regulated Single & Dual Output DC/DC Converter



Picture similar

- **1" x 1" Package**
- **Wide 4:1 Input Range**
- **1600VDC Isolation**
- **No Minimum Load Required**
- **Efficiency up to 92%**
- **Operating Temperature Range -40°C ~ +100°C max.**
- **Adjustable Output Voltage**
- **Over Current Protection, Over and Under Voltage Protection**
- **Metal Case, Optional with Heat-sink**
- **Soft Start**
- **Remote On/Off Control**

Output Specifications	
Voltage Accuracy	±1%, max.
Output Voltage Adjustability (Trim)	Single Output: ±10% max.
Maximum Output Current	See table
Line Regulation	Single & Dual ±0.5% max.
Load Regulation	from 0% to 100% Load: ±0.5 ~ ±1% max. Dual: ±1%,max.(balanced load)
Cross Regulation (Dual Output)	±5%
Over Voltage Protection	118 ~ 125% of Vout typ.
Over Current Protection	170% of FL typ.
Short Circuit Protection	Indefinite (Automatic Recovery)
Ripple & Noise (20 MHz bandwidth)	60 ~ 75mV 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	30ms typ.
No-Load/Full-Load Input Current	See table
Input Filter	C/L (see filter details on following pages)
Input Reflected Ripple Current	30mA pk-pk typ.
Remote ON	3.0 ~ 12VDC or open circuit
Remote OFF	0 ~ 1.2VDC or short circuit pin 2 and 3
OFF Idle Current	5mA typ.
Surge Voltage (100 ms) †)	
24V Models 48V Models	50VDC max. 100VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	1600VDC
Isolation Voltage Metal Case/Input&Output	1600VDC
I/O Isolation Capacitance	2000pF typ.
I/O Isolation Resistance	1000M Ohm, min
Switching Frequency	270 ~ 330kHz typ.
Humidity	95% rel H
Reliability Calculated MTBF	>370KHrs (MIL-HDBK-217 f)
Safety Standard(s)	UL60950-1 (approval), UL62368-1 (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 (optional Heat-sink)
Soldering Profile and Peak Temperature	Wave Flow: 260°C (1.5 mm from case), 10s, max.

Physical Specifications	
Case Material	Copper Black Base Material: Non-conductive Black Plastic (UL94V-0 rated)
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	19.0g
Case Dimensions	1.00" x 1.00" x 0.40"

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 RSG accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.

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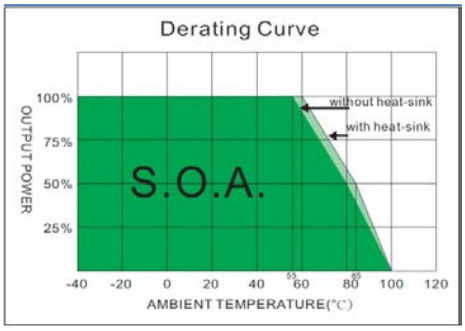
RV7-S/D30W

NUMBER STRUCTURE

RV7 - XX XX X XX A X W X

- **RV7** – Name/Package: RV7 = 1″ x 1″
- **XX** – Input: 24=9.0-36V, 48=18-75V
- **XX** – Output: 03=3.3V, 05=5.0V, 12=12V, 15=15V
- **X** – Type: S = Single Output, D = Dual Output
- **XX** – Power (W): 30=3.00
- **A** – Code: internal
- **X** – Isolation (kVDC): 1= 1.6
- **W** – W = 4:1 input Range
- **X** – K = Option mit Kühlkörper



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL (%, typ.)	Capacitor Load @FL (µF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
RV7-2403S30A1W	9-36, 24V Nominal	10	1093.75	3.3	0	7000	88	10000
RV7-2405S30A1W	9-36, 24V Nominal	10	1404.49	5	0	6000	89	7200
RV7-2412S30A1W	9-36, 24V Nominal	10	1404.49	12	0	2500	89	1200
RV7-2415S30A1W	9-36, 24V Nominal	10	1373.62	15	0	2000	91	1000
RV7-4803S30A1W	18-75, 48V Nominal	8	540.73	3.3	0	7000	89	10000
RV7-4805S30A1W	18-75, 48V Nominal	8	694.44	5	0	6000	90	7200
RV7-4812S30A1W	18-75, 48V Nominal	8	694.44	12	0	2500	90	1200
RV7-4815S30A1W	18-75, 48V Nominal	8	679.34	15	0	2000	92	1000
RV7-2412D30A1W	9-36, 24V Nominal	10	1404.49	±12	0	±1250	89	±750
RV7-2415D30A1W	9-36, 24V Nominal	10	1373.62	±15	0	±1000	91	±500
RV7-4812D30A1W	18-75, 48V Nominal	8	694.44	±12	0	±1250	90	±750
RV7-4815D30A1W	18-75, 48V Nominal	8	686.81	±15	0	±1000	91	±500

1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Tested by minimal Vin and constant resistive load.
3. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
4. Measured Input reflected ripple current with a simulated source inductance of 12uH and a source capacitor Cin(47uF, ESR<1.0© at 100KHz).
5. The remote on/off control pin is referenced to -Vin (pin2).
6. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
7. "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).
8. Input filter components are used to help meet conducted emissions (refer to the EMI Filter of design & feature configuration).
9. An external filter capacitor is required if the module has to meet EN61000-4-4,EN61000-4-5:
   24Vin Models: recommended is an aluminum electrolytic capacitor (Nippon chemi-con KY series, 330uF/100V) and a TVS (SMDJ58A, 58V, 3000W peak pulse power) to connect in parallel.
   48Vin Models: recommended is an aluminum electrolytic capacitor (Nippon chemi-con KY series, 330uF/100V) and a TVS (SMDJ120A, 120V, 3000W peak pulse power) to connect in parallel.

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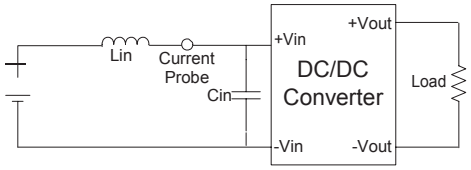
TEST CONFIGURATIONS

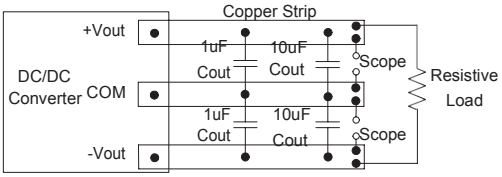
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12uH) and a source capacitor Cin(47uF, ESR<1.0© at 100KHz) at nominal input and full load.



Output Ripple & Noise Measurement Test

To reduce ripple and noise, it is recommended to use a 1uF ceramic disk capacitor and a 10uF ceramic disk capacitor to at the output.



DESIGN & FEATURE CONFIGURATIONS

Over Voltage Protection

The module includes an internal output over voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over voltage set point, the module will activate the control loop of internal circuit to clamp the output voltage.

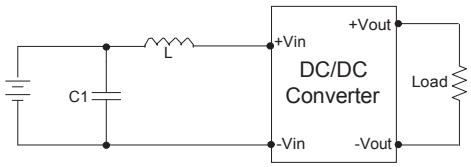
Over Temperature Protection

The over temperature protection consists of circuitry that provides protection from thermal damage. If the temperature exceeds the over temperature threshold the module will shut down.

The module will try to restart after shut down, If the over temperature condition still exists during restart, the module will shut down again. This restart trial will continue until the temperature is within specification.

EMI Filter

Input filter components (C1,L) are used to help meet conducted emissions .
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



	C1	L
RV7-24XXXXX	1206, 3.3uF/100V	0.82uH
RV7-48XXXXX	1206, 1uF/100V	2.2uH

Over Current Protection

The module includes an internal over current protection circuit, which will endure current limiting for an unlimited duration during output over load condition. If the output current exceeds the OCP set point, the module will shut down automatically (hiccup).

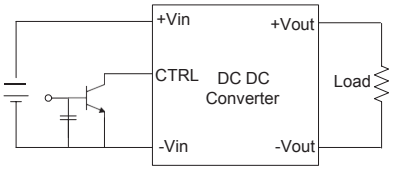
The module will try to restart after shut down.
If the over load condition still exists, the module will shut down again.

CTRL Module ON / OFF

Positive logic turns on the module during high logic and off during low logic.

Ctrl module on/off can be controlled by an external switch between the ctrl terminal and -Vin terminal.
The switch can be an open collector or open drain

For positive logic if the ctrl feature is not used, please leave the ctrl pin floating.



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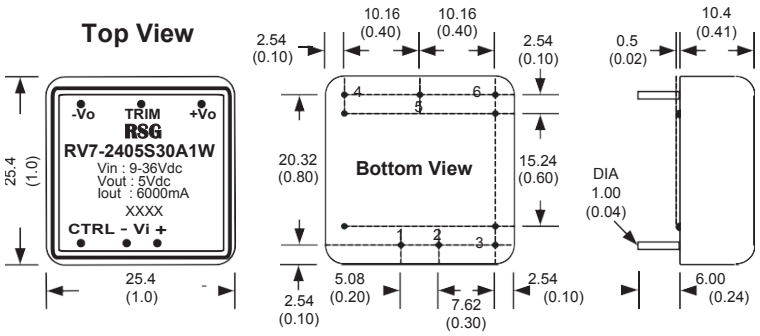
MECHANICAL SPECIFICATIONS

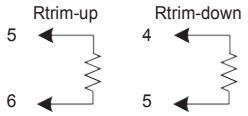


PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	+Vout	+Vout
5	Trim	Com
6	-Vout	-Vout

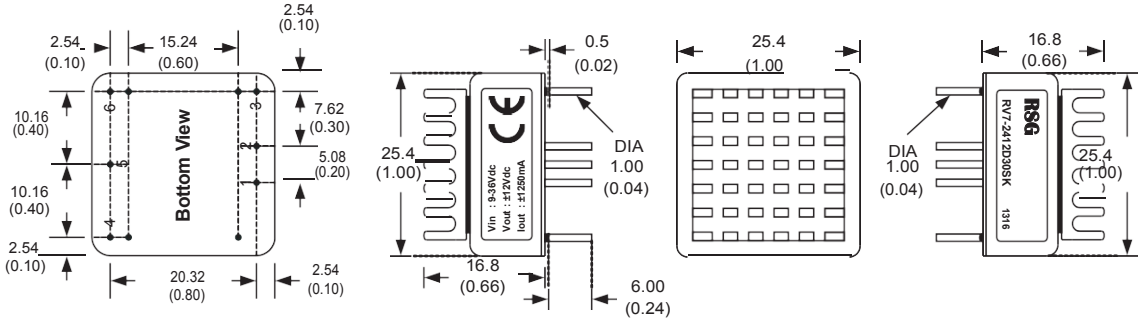
All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. (single output models only)



With Heat-sink



Order code: RV7-...30A1WK (contains: heat-sink, thermal pad)
Material: Aluminum
Finish: Anodic treatment (black)
Weight: 2.9 g (0.1oz) (without converter)

Note:
1. Converters will be supplied with heat-sinks already mounted. Please contact RSG for quotation.

The models listed above are standard types. If you need special specifications or have questions regarding packing(Tube or Tape&Reel) or need application support, please contact our specialists: sales@rsg-electronic.de or +49 69-984047-0

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