

RV7-S/D30W

- 1" x 1" Package
- Wide 4:1 Input Range
- 1600VDC Isolation
- Over Temperature Protection
- Continuous Short Circuit Protection
- Over Voltage Protection
- Over Load Protection
- Efficiency up to 92%
- Operating Temperature Range -40° ~ +85°C
- Metal Case, Optional with Heat-sink
- Soft Start
- Remote on/off Control



RoHS

| OUTPUT SPECIFICATION | |
|--|--|
| Voltage accuracy: | ±1.0% |
| Line regulation: | Single & Dual ± 0.5% max. |
| LOAD REGULATION: | from 0% to 100% Load: ±0.5 - 1% max. |
| Cross Regulation (Dual Output): | ± 5% |
| Over Voltage Protection (Zener diode clamp): | Zener Diode Clamp |
| Over Current Protection: | 170% of I _L , typ.. |
| Short Circuit Protection : | Indefinite (Automatic Recovery) |
| Ripple noise (20Mhz bandwidth): | 60-75mV pk-pk max. |
| Temperature coefficient: | ±0.02%/°C |
| Capacitor load: | See table |
| Transient Recovery Time: | 250us, typ. |
| Transient Response: | (Deviation) ±3-5% max. |
| INPUT SPECIFICATIONS | |
| Voltage Range: | See table |
| Start up Time: | 30ms, typ. |
| Max. Input Current: | See table |
| No-Load/Full-Load Input Current: | See table |
| Input Filter: | PI Type |
| Input Reflected Ripple Current : | 30mA pk-pk typ. |
| Remote On/Off (positive logic): | On: 3.0~12VDC or open circuit, OFF: 0~1.2VDC or Short circuit pin 2 and 3, OFF idle current: 2mA typ. |
| OFF idle current: | See table typ. |
| GENERAL SPECIFICATIONS | |
| Efficiency: | See table typ. |
| I/O Isolation Voltage (60sec): | 1600VDC, Input/Output, Case/Input & Output |
| I/O Isolation Capacitance: | 2000pF typ. |
| I/O Isolation Resistance: | 1000M Ohm |
| Switching Frequency: | 270kHz-330kHz, typ. |
| Humidity: | 95% rel H |
| Reliability Calculated MTBF : | > 370KHrs (MIL-HDBK-217 f) |
| Safety Standard: (designed to meet): | IEC 60950-1 |

| ENVIRONMENTAL SPECIFICATION | |
|--------------------------------|---|
| Operating Temperature range: | -40°C ~ +100°C (see Derating Curve) |
| Maximum Case Temperature: | 105°C |
| Storage Temperature : | -55°C ~ +125°C |
| Cooling : | Nature Convection (with Heat-sink) |
| 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 Case-DIP: | 19.0g |
| Dimension DIP: | 1.0" x 1.0" x 0.4" |
| ABSOLUTE MAXIMUM RATINGS (1) | |
| Input Surge Voltage (100ms)/ | |
| 24V Models: | -0.7~50VDC |
| 48V Models: | -0.7~100VDC |
| Soldering Temperature: | 260°C max. |
| EMC SPECIFICATIONS (2) | |
| Radiated-/Conducted Emissions: | IEC 61000-4-2 Perf.Criteria A |
| ESD: | IEC 61000-4-3 Perf.Criteria A |
| RS: | IEC 61000-4-4 Perf.Criteria A |
| EFT: | IEC 61000-4-5 Perf.Criteria A |
| SURGE: | IEC 61000-4-6 Perf.Criteria A |
| CS: | IEC 61000-4-8 Perf.Criteria A |
| PFMF | IEC 61000-4-8 Perf.Criteria A |

1) These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

2) (1.5mm from case 10sec Max.)

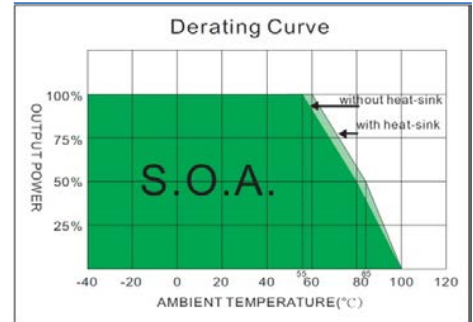
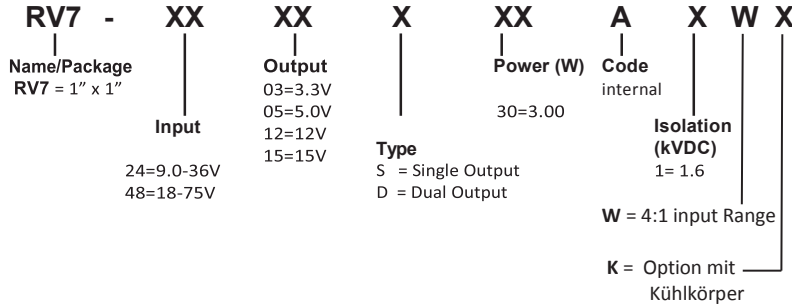
3) All specifications typical at TA= 25°C, nominal input voltage and full load unless otherwise specified.

4) 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.

RV7-S/D30W

NUMBER STRUCTURE



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 |

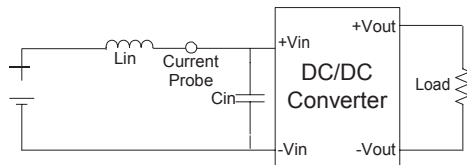
- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Tested by minimal Vin and constant resistive load.
- Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
- Measured Input reflected ripple current with a simulated source inductance of 12uH and a source capacitor Cin(47uF, ESR<1.0@ at 100KHz).
- The remote on/off control pin is referenced to -Vin(pin2).
- Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
- "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0LFM).
- Input filter components are used to help meet conducted emissions,
Which application refer to the EMI Filter of design & feature configuration.
- An external filter capacitor is required if the module has to meet EN61000-4-4,EN61000-4-5.
The RV7-24XXXX30 recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 330uF/100V) and a TVS (SMDJ58A,58V,3000Watt peak pulse power) to connect in parallel.
The RV7-48XXXX30 recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 330uF/100V) and a TVS (SMDJ120A,120V,3000Watt peak pulse power) to connect in parallel.

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TEST CONFIGURATIONS

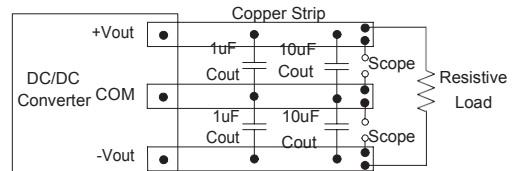
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12uH) and a source capacitor C_{in} (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.

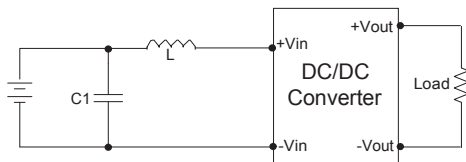
Over Temperature Protection

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 |
|--------------|------------------|--------|
| RV7-24XXXXXX | 1206, 3.3uF/100V | 0.82uH |
| RV7-48XXXXXX | 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).

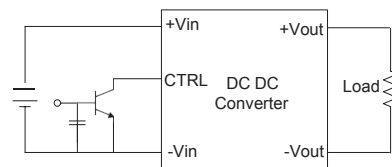
The module will try to restart after shut down. If the over load condition still exists, the module will shut down again.

CTRL Module ON / OFF

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

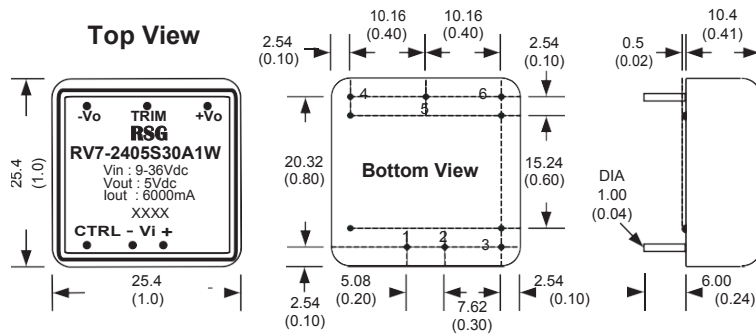
Ctrl module on/off can be controlled by an external switch between the ctrl terminal and -Vin terminal. The switch can be an open collector or open drain

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



MECHANICAL SPECIFICATIONS

RV7-S/D30W

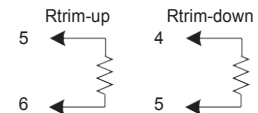


| PIN CONNECTIONS | | |
|-----------------|--------|-------|
| PIN NUMBER | SINGLE | DUAL |
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | CTRL | CTRL |
| 4 | +Vout | +Vout |
| 5 | Trim | Com |
| 6 | -Vout | -Vout |

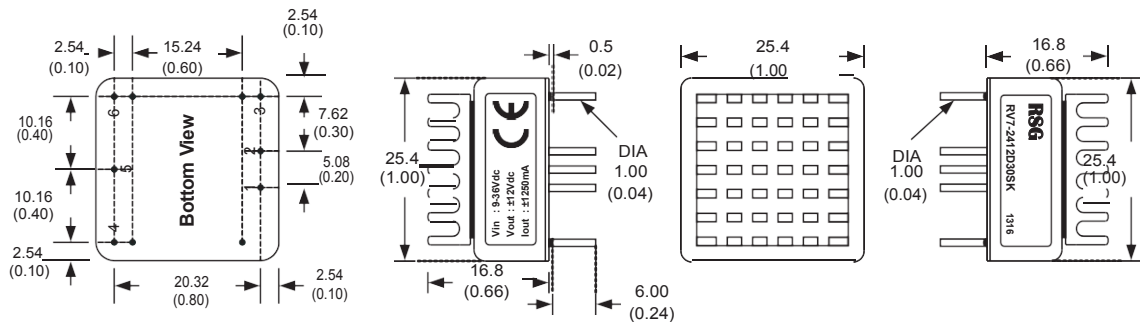
- All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ± 0.05 (0.04 ± 0.002)
 2. Pin pitch tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)
 4. Stand-off tolerance: ± 0.1 (± 0.004)

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