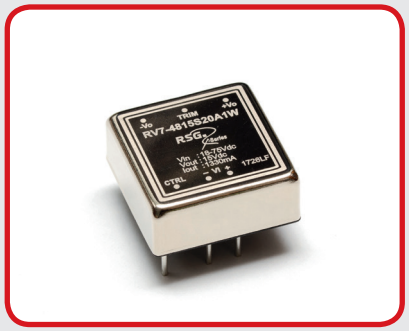
RV7-S/D20

20W Regulated Single & Dual Output DC/DC Converter



Picture similar

RoHS

- 1" x 1" Package
- Wide 2:1 Input Range
- 1600VDC Isolation
- No Minimum Load Required
- Efficiency up to 90%
- Operating Temperature Range -40°C ~ +75°C
- Adjustable Output Voltage
- Over Current Protection, Over and Under Voltage Protection
- EMI filter meets EN55032 class A without external components
- 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	Single: ±0.5% max. Dual: ±1%,max.(balanced load)
Cross Regulation (Dual Output)	±5%
Over Voltage Protection	118 ~ 125% of Vout typ.
Over Current Protection	140% of FL typ.
Short Circuit Protection	Indefinite (hiccup) (Automatic Recovery)
Ripple & Noise (20 MHz bandwidth)	75 ~ 100mV pk-pk max.
Temperature Coefficient	±0.02%/°C
Transient Recovery Time	250µs typ.
Transient Response Deviation	±3% 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) †)	
12V Models 24V Models 48V Models	25VDC max. 50VDC max. 100VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	1600VDC
Isolation Voltage Metal Case/Input&Output	1600VDC
I/O Isolation Capacitance	1500pF typ.
I/O Isolation Resistance	1000M Ohm, min
Switching Frequency	330kHz typ.
Humidity	95% rel H
Reliability Calculated MTBF	>560khrs (MIL-HDBK-217 f)
Safety Standard(s)	UL60950-1 (approval), UL62368-1 (meet)

Environmental Specifications	
Operating Temperature Range	-40°C ~ +75°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	Nickel-coated Copper 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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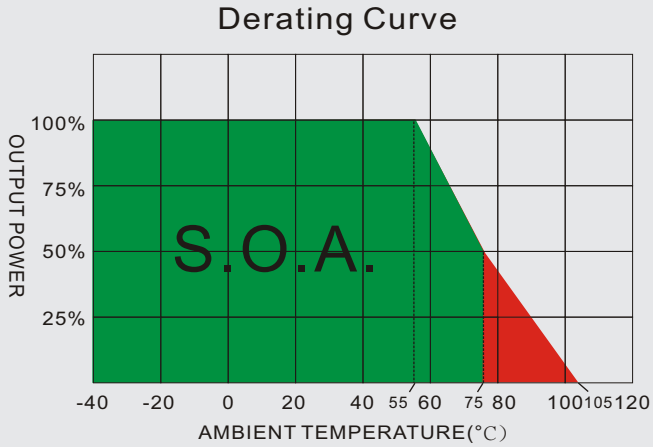
Number structure RV7

RV7	–	24	05	S	15	A	1	(W)	(K)
Name / package		**V-input nom.**	**V-output**	**Output type**	**Power**	**Int. Code**	**Isolation**	**Wide-Input**	**Heat-Sink**
RV7 = 1" x 1"		12 = 9V~18V 24 = 18V~36V or 9V~36V 48 = 36V~75V or 18V~75V	03 = 3.3V 05 = 5V … 15 = 15V	S = Single D = Dual	15 = 15W 20 = 20W … 30 = 30W	Logistics Code	1 = 1.6 kVDC	_ = 2:1 W = 4:1	_ = without K = with



Model Selection Guide

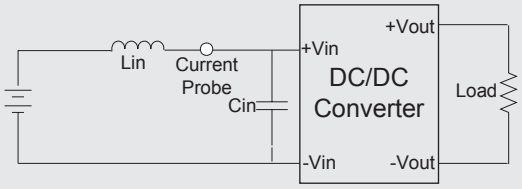
Model Number	Input	Input Current		Output	Output Current		Efficiency	Capacitor Load
	Voltage Range (V DC)	No-Load (mA, max.)	Full Load (mA, typ.)	Voltage (V DC)	Min. Load (mA)	Full Load (mA)	@ Full Load (%, typ.)	@ Full Load (µF, max.)
RV7-1203S20A1	9~18, 12V Nominal	60	1439	3.3	0	4500	86	7000
RV7-1205S20A1	9~18, 12V Nominal	60	1852	5	0	4000	90	5000
RV7-1212S20A1	9~18, 12V Nominal	30	1873	12	0	1670	89	850
RV7-1215S20A1	9~18, 12V Nominal	30	1873	15	0	1330	89	700
RV7-2403S20A1	18~36, 24V Nominal	34	720	3.3	0	4500	86	7000
RV7-2405S20A1	18~36, 24V Nominal	35	936	5	0	4000	89	5000
RV7-2412S20A1	18~36, 24V Nominal	25	936	12	0	1670	89	850
RV7-2415S20A1	18~36, 24V Nominal	25	936	15	0	1330	89	700
RV7-4803S20A1	36~75, 48V Nominal	25	360	3.3	0	4500	86	7000
RV7-4805S20A1	36~75, 48V Nominal	25	468	5	0	4000	89	5000
RV7-4812S20A1	36~75, 48V Nominal	15	468	12	0	1670	89	850
RV7-4815S20A1	36~75, 48V Nominal	15	463	15	0	1330	85	700
RV7-1212D20A1	9~18, 12V Nominal	30	1873	±12	0	±833	89	±470
RV7-1215D20A1	9~18, 12V Nominal	30	1873	±15	0	±667	89	±330
RV7-2412D20A1	18~36, 24V Nominal	30	936	±12	0	±833	89	±470
RV7-2415D20A1	18~36, 24V Nominal	30	936	±15	0	±667	89	±330
RV7-4812D20A1	36~75, 48V Nominal	20	468	±12	0	±833	89	±470
RV7-4815D20A1	36~75, 48V Nominal	20	468	±15	0	±667	89	±330

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 69-984047-0

Test Configurations

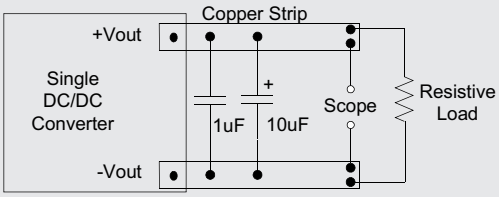
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12 μH) and a source capacitor Cin(47 μF, ESR<1.0Ω at 100kHz) at nominal input and full load.



Output Ripple & Noise Measurement Test

Measured with a 1 μF MLCC and a 10 μF Tantalum capacitor.
The scope measurement bandwidth is 0-20 MHz.



Design & Feature Configurations

Over Voltage Protection

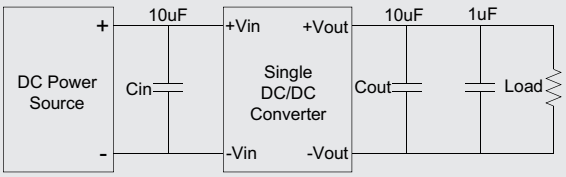
The module includes an internal output over voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over voltage set point, the module will activate the control loop of internal circuit to clamp the output voltage.

Over 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.

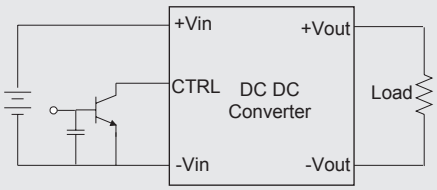
Output Ripple & Noise Reduction

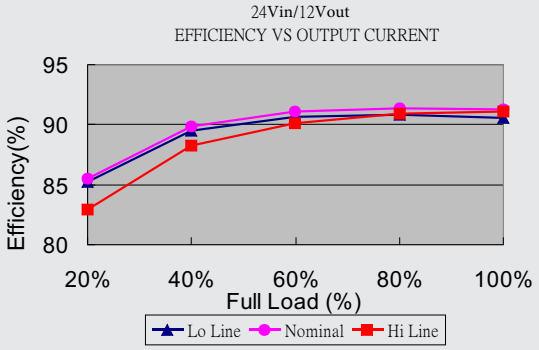
To reduce ripple and noise, it is recommended to use a 1 μF ceramic disk capacitor and a 10 μF electrolytic capacitor at the output.

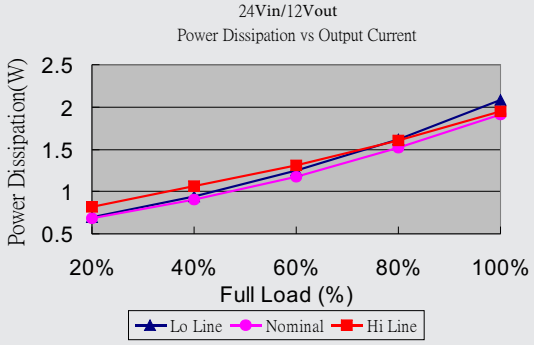


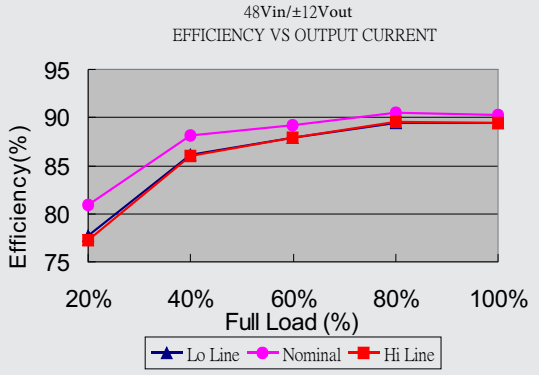
CTRL Module ON / OFF

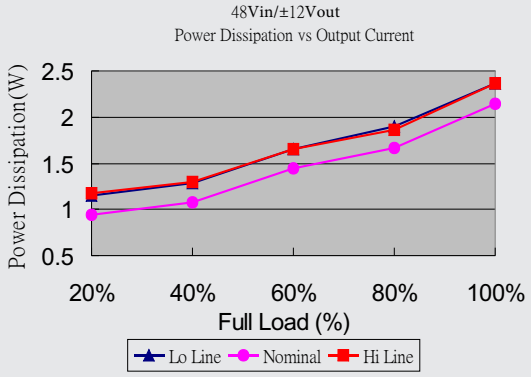
Positive logic turns on the module during high logic and off during low logic.
Ctrl module on/off can be controlled by an external switch between the ctrl terminal and -Vin terminal.
The switch can be an open collector or open drain.
For positive logic if the ctrl feature is not used, please leave the ctrl pin floating.



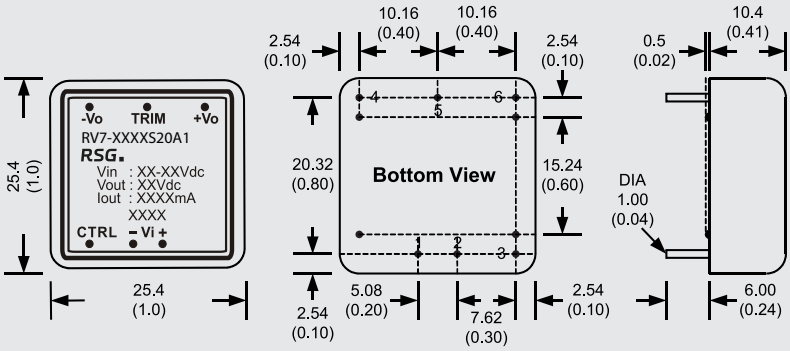








Mechanical Specifications

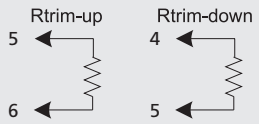


Pin Connections		
Pin Number	**Single**	**Dual**
1	+V Input	+V Input
2	-V Input	-V Input
3	CTRL	CTRL
4	+V Output	+V Output
5	Trim	Com
6	-V Output	-V Output

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. 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).



Notes

1. For Cross Regulation one load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Capacitive Load is tested by minimal Vin and constant resistive load.
3. Transient Recovery is 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 12 μH and a source capacitor Cin (47 μF, ESR<1.0Ω 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. "Natural Convection" is usually about 30-65 LFM and not equal to still air (0 LFM).
8. Input filter meets EN55032 Class A without external components.
9. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5. The recommended filter capacitor is Nippon chemi-con KY series, 220μF/100V).

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