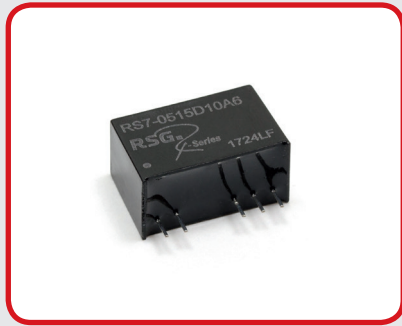


RSM-S/D20v2

2.0W Unregulated Single & Dual Output DC/DC Converter



Picture similar

- 7 Pin SIL Package
- $\pm 10\%$ Input Range
- Reinforced 4200VAC/6000VDC Isolation
- EN60601-1, ANSI/AAMI ES60601-1 medical safety (1xMOPP/2xMOOP)
- Efficiency up to 84%
- Operating Temperature Range $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Patient leakage current max. $2\mu\text{A}$
- Low Ripple and Noise
- Non Conductive Black Plastic Case

RoHS

Output Specifications	
Voltage Accuracy	See tolerance envelope graph
Maximum Output Current	See table
Line Regulation	$\pm 1.2 \sim 1.5\%$ max.(per $\pm 1\%$ Vin Change)
Load Regulation	from 10% to 100% Load: 15% to 20% max. –
Cross Regulation (Dual Output)	–
Short Circuit Protection	3s
Ripple & Noise (20 MHz bandwidth)	100mV typ., 150mV pk-pk max.
Temperature Coefficient	$\pm 0.02\%/^{\circ}\text{C}$
Capacitor Load	See table

Input Specifications	
Voltage Range	See table
Start-up Time	–
No-Load/Full-Load Input Current	See table
Input Filter	C/L (see filter details on following pages)
Input Reflected Ripple Current	200mA typ.

General Specifications	
Efficiency	See table typ.
I/O Isolation Voltage (60 sec)	4200VAC; 6000VDC
Out1/Out2 Isolation Voltage (Dual Separate)	–
I/O Isolation Capacitance	5pF typ.
I/O Isolation Resistance	1000M Ohm, min
Switching Frequency	100kHz typ.
Humidity	95% rel H
Reliability Calculated MTBF	>3.5Mhrs (MIL-HDBK-217 f)
Safety Standard(s)	EN60601-1, ANSI/AAMI ES60601-1 (meet)

Environmental Specifications	
Operating Temperature range	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ (see Derating Curve)
Maximum Case Temperature	–
Storage Temperature	$-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$
Cooling	Natural Convection

Physical Specifications	
Case Material	Black flame-retardant, heat-resistant plastic (UL94 V-O)
Pin Material SIP Case	–
Pin Material DIP Case	–
Potting Material	–
Weight SIP Case	4.2g typ.
Weight DIP Case	–
Dimensions SIP Case	0.77" x 0.39" x 0.49"
Dimensions DIP Case	–

Absolute Maximum Ratings (1)	
Input Surge Voltage (100 ms)	
5V Models	9VDC max.
12V Models	18VDC max.
15V Models	21VDC max.
24V Models	30VDC max.
Soldering Temperature (2)	Pin Welding Resistance 300°C max. (Welding spot is 1.5mm away from the casing, 10 seconds)

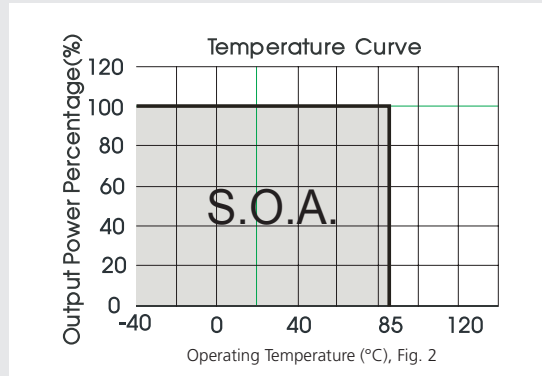
EMC Specifications	
Radiated / Conducted Emissions	EN60601-1-2/CISPR 11 Group1 Class B see EMI Filter
ESD	IEC 61000-4-2 Perf.Criteria A
RS	–
EFT	–
SURGE	–
CS	–
PFMF or Voltage Dip/Drop/Interruption	–

(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 $T_A = 25^{\circ}\text{C}$, 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 RSM series

RSM	–	12	15	S	10	D	6	(v2)
Name/package	V-input nom.	V-output	Output type	Power	Int. Code	Isolation		
RSM = SIL7 Medical	03 = 3.3V 05 = 5V ... 24 = 24V	03 = 3.3V 05 = 5V ... 24 = 24V	S = Single D = Dual	10 = 1.00W ... 20 = 2.00W	Logistics Code	6 = 6.0kVDC		



Model Selection Guide

Model Number	Input		Output		Efficiency	Capacitor Load (µF)
	Voltage (VDC) Nom. (Range)	max. Current (mA) full/no load	Voltage (V DC)	Current (mA) max./min.	@ Full Load (%, Min./Typ.)	max.
RSM-0505S20D6v2	5 (4.5-5.5)	520/35	5	400/40	73/77	1000
RSM-0512S20D6v2	5 (4.5-5.5)	520/35	12	167/17	75/79	470
RSM-0515S20D6v2	5 (4.5-5.5)	520/35	15	133/14	75/79	470
RSM-1205S20D6v2	12 (10.8-13.2)	217/15	5	400/40	72/76	1000
RSM-1212S20D6v2	12 (10.8-13.2)	217/15	12	167/17	75/79	470
RSM-1215S20D6v2	12 (10.8-13.2)	217/15	15	133/14	77/81	470
RSM-1505S20D6v2	15 (13.5-16.5)	171/18	5	400/40	73/77	1000
RSM-1515S20D6v2	15 (13.5-16.5)	171/18	15	133/14	78/82	470
RSM-2405S20D6v2	24 (21.6-26.4)	106/10	5	400/40	75/79	1000
RSM-2412S20D6v2	24 (21.6-26.4)	106/10	12	167/17	78/82	470
RSM-2415S20D6v2	24 (21.6-26.4)	106/10	15	133/14	80/84	470
RSM-0505D20D6v2	5 (4.5-5.5)	520/35	±5	±200/±20	74/78	470
RSM-0509D20D6v2	5 (4.5-5.5)	520/35	±9	±111/±12	74/78	470
RSM-0512D20D6v2	5 (4.5-5.5)	520/35	±12	±83/±9	74/78	220
RSM-0515D20D6v2	5 (4.5-5.5)	520/35	±15	±67/±7	76/80	220
RSM-1205D20D6v2	12 (10.8-13.2)	217/15	±5	±200/±20	70/74	470
RSM-1209D20D6v2	12 (10.8-13.2)	217/15	±9	±111/±12	76/80	470
RSM-1212D20D6v2	12 (10.8-13.2)	217/15	±12	±83/±9	76/80	220
RSM-1215D20D6v2	12 (10.8-13.2)	217/15	±15	±67/±7	73/77	220
RSM-1505D20D6v2	15 (13.5-16.5)	171/18	±5	±200/±20	73/77	470
RSM-1509D20D6v2	15 (13.5-16.5)	171/18	±9	±111/±12	76/80	470
RSM-1515D20D6v2	15 (13.5-16.5)	171/18	±15	±67/±7	69/73	220
RSM-2405D20D6v2	24 (21.6-26.4)	106/10	±5	±200/±20	75/79	470
RSM-2409D20D6v2	24 (21.6-26.4)	106/10	±9	±111/±12	77/81	470
RSM-2412D20D6v2	24 (21.6-26.4)	106/10	±12	±83/±9	78/82	220
RSM-2415D20D6v2	24 (21.6-26.4)	106/10	±15	±67/±7	77/81	220

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

Product Characteristic Curve

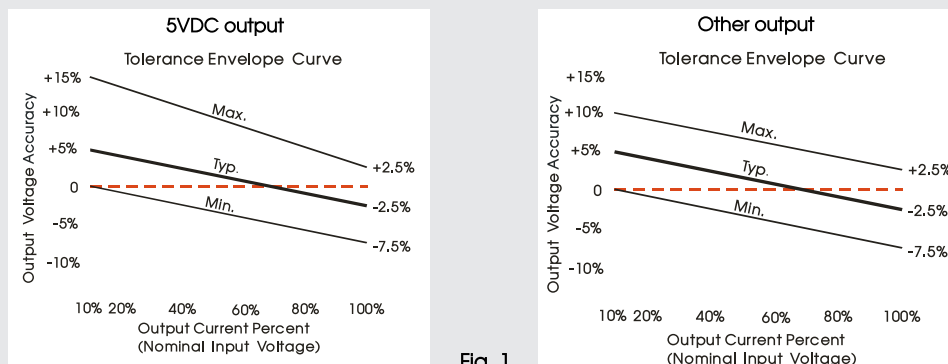
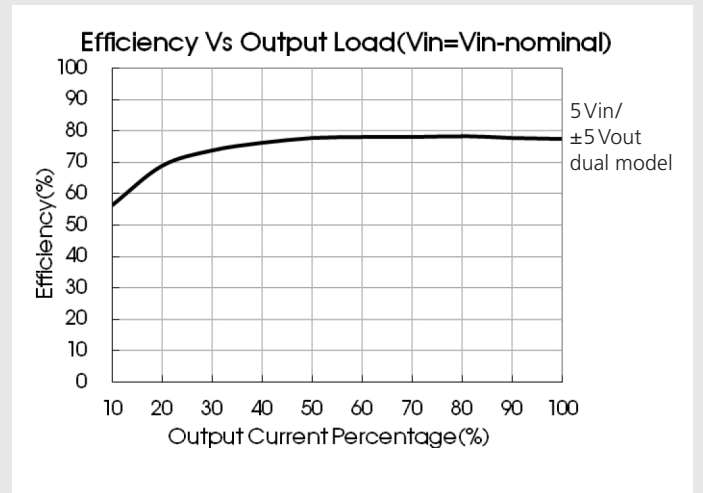
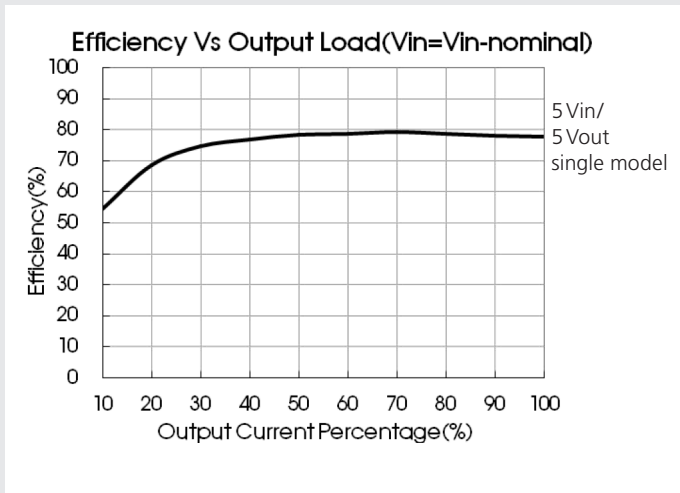
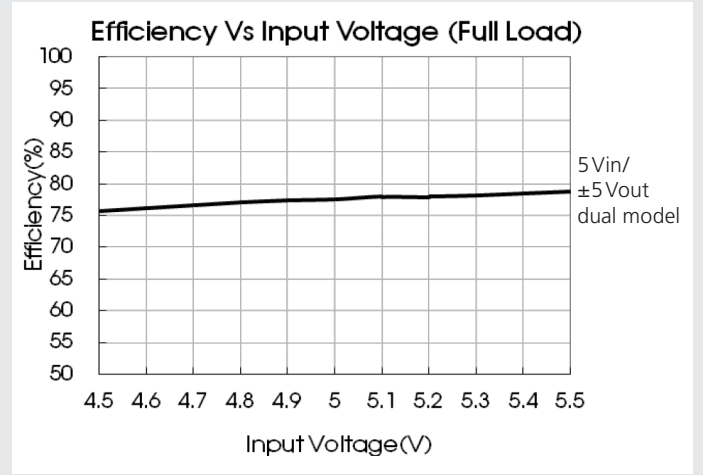
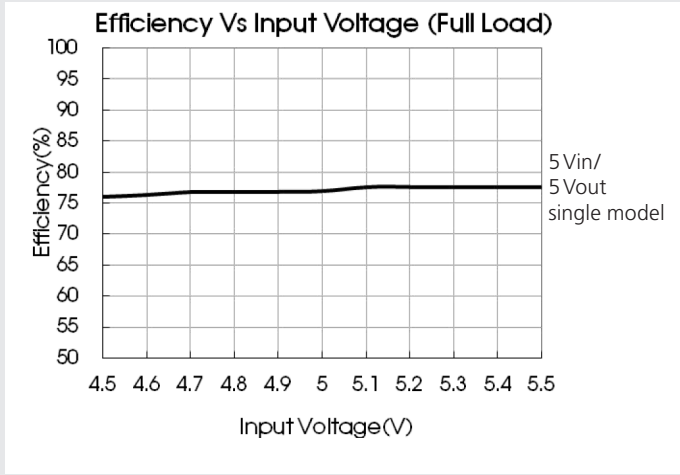


Fig. 1

Electrical Characteristic Curves

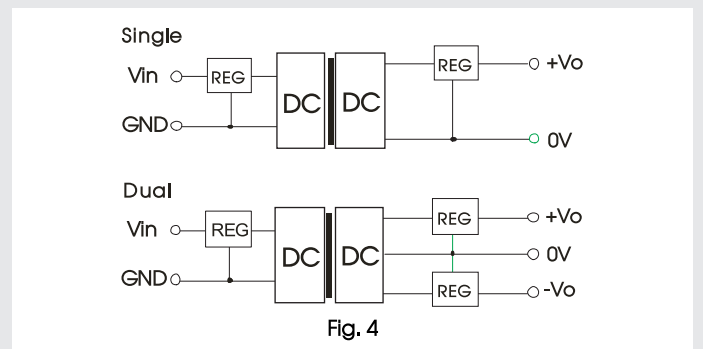
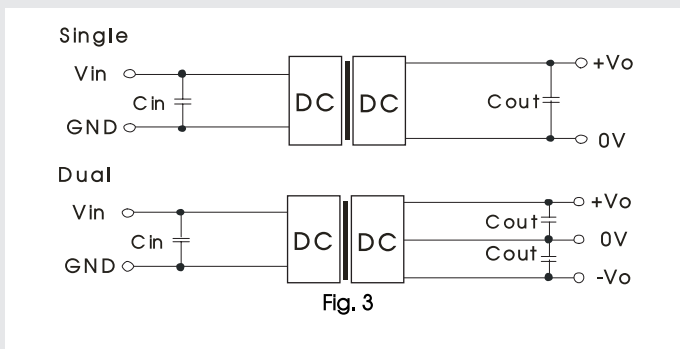


Design Reference

1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.3. Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

For a tight output voltage regulation, including overvoltage, overcurrent and over temperature protection, we recommend the use of a linear regulator that is connected in series to the input and/or output terminals as shown in Fig. 4.



Recommended input and output capacitor values (Table 1)					
V_{IN} (VDC)	C_{IN} (μ F)	Single V_{OUT} (VDC)	C_{OUT} (μ F)	Dual V_{OUT} (VDC)	C_{OUT} (μ F)
5	10	5	10	±5	4.7
12/15	4.7	12	2.2	±9	2.2
24	2.2	15	1	±12/±15	1

2. EMC compliance circuit (CLASS B)

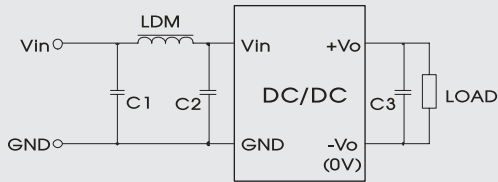


Fig. 5

Recommended EMC filter values (Table 2)

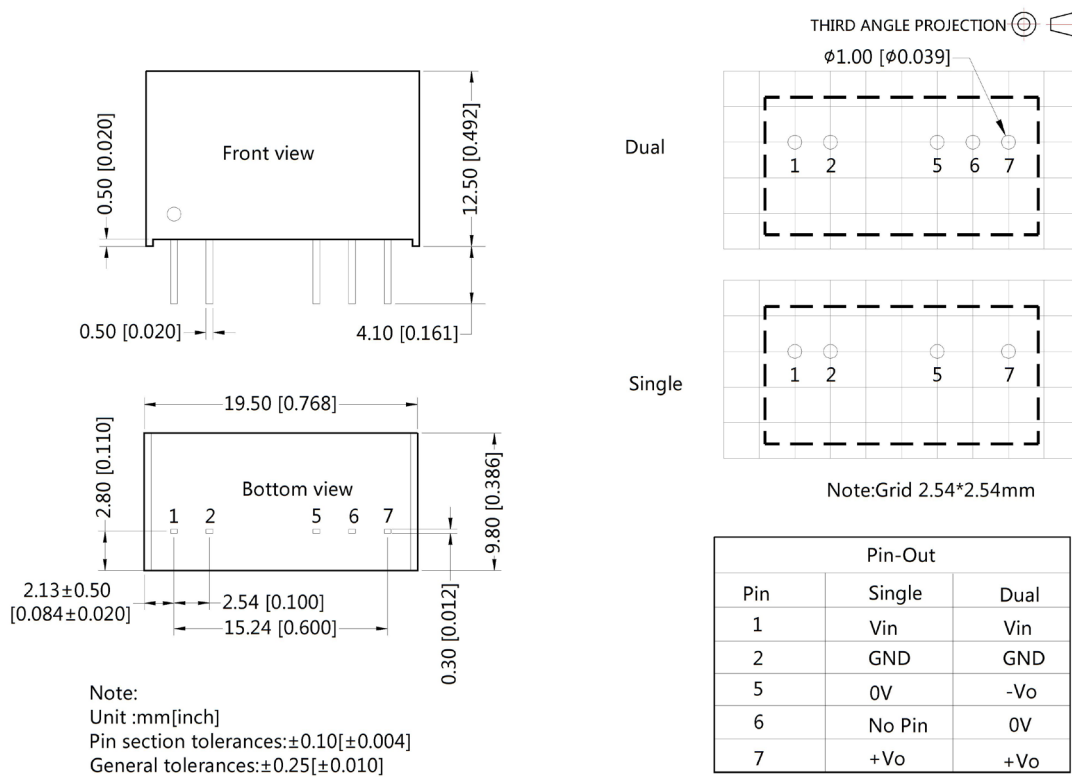
Vin (VDC)		5/12/15	24
EMI	C1, C2	4.7 μF/50V	
	C3	Refer to the Cout in Fig. 3	
	LDM	6.8 μH	15 μH

Note: For 15 Vin/±15 Vout Dual model C1/C2 is 10 μF/25V and LDM is 22 μH.

3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10 % rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side. (The sum of the efficient power and resistor consumption power is not less than 10 %).

Mechanical Specifications



Notes

1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet.
2. The maximum capacitive loads offered were tested at input voltage range and full load.
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25, humidity<75%RH with nominal input voltage and rated output load.