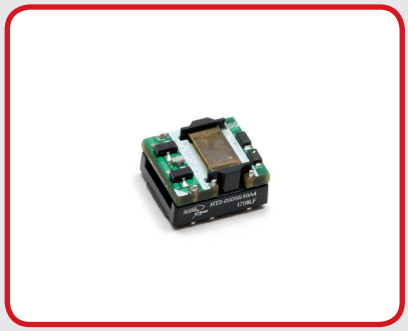
RT2-S20

2.0W Unregulated Single Output DC/DC Converter



Picture similar

- **8 Pin (5) SMD Package**
- **±10% Input Range**
- **4200VDC High Isolation**
- **EMI Complies with EN55032 Class B**
- **Efficiency up to 81%**
- **High Operating Temperature Range -40°C ~ +105°C**
- **Short Circuit Protection Automatic Recovery**
- **Rated working voltage for 250Vrms and 400VDC**
- **Non Conductive Black Plastic Case**

CE
RoHS

Output Specifications	
Voltage Accuracy	See tolerance envelope curve
Maximum Output Current	See table
Line Regulation	±1.2% max. (per ±1% Vin Change)
Load Regulation	from 10% to 100% Load: ±14% to ±15% max. –
Cross Regulation (Dual Output)	–
Short Circuit Protection	0.5s, max.
Ripple & Noise (20 MHz bandwidth)	150mV pk-pk max.
Temperature Coefficient	±0.03%/°C

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	20mA pk-pk typ.
Surge Voltage (100 ms) †)	
3.3V Models 5V Models	5VDC max. 9VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	4200VDC Qualification tested
Out1/Out2 Isolation Voltage (Dual Separate)	–
I/O Isolation Capacitance	25pF typ.
I/O Isolation Resistance	1000M Ohm, min
Switching Frequency	40 ~ 80kHz
Humidity	95% rel H
Reliability Calculated MTBF	>6.5MHrs (MIL-HDBK-217 f)
Safety Standard(s)	IEC/EN60950-1 (designed to meet)

Environmental Specifications	
Operating Temperature range	-40°C ~ +105°C (see Derating Curve)
Maximum Case Temperature	–
Storage Temperature	-55°C ~ +125°C
Cooling	Natural Convection
Soldering Profile and Peak Temperature	Pb-free Reflow: 245°C, 10s, max. (IPC/JEDEC J-STD-020D.1, MSL 1)

Physical Specifications	
Case Material	Non-conductive Black Plastic (UL94V-0 rated)
Pin Material SIP Case	–
Pin Material DIP Case	0.5mm C519R-H Solder -coated
Potting Material	n.c. black plastic (UL94V-V0)
Weight SIP Case	–
Weight DIP Case	1.5g typ.
Dimensions SIP Case	–
Dimensions DIP Case	0.50" x 0.44" x 0.27"

EMC Specifications	
Radiated / Conducted Emissions	EN55032 Class B 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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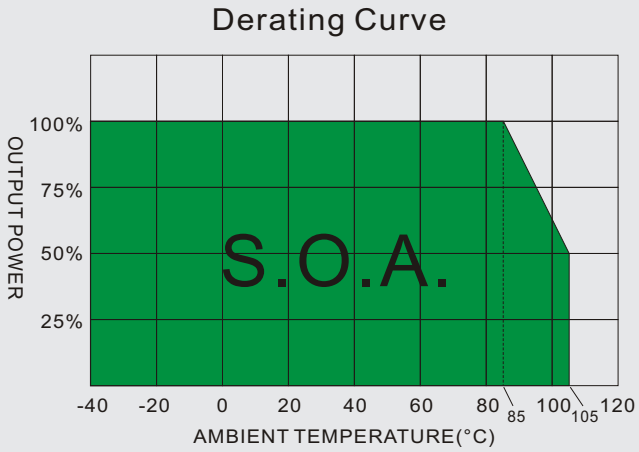
Number structure RT2

RT2	–	03	05	_	S	10	A	4
Name/package		V-input nom.	V-output	Regulation	Output type	Power	Int. Code	Isolation
RT2 = SMT-8 (open-frame)		03 = 3.3 V 05 = 5 V	03 = 3.3 V 05 = 5 V	_ = unreg.	S = Single	10 = 1.00 W 20 = 2.00 W	Logistics Code	4 = 4.2 kV DC



Model Selection Guide

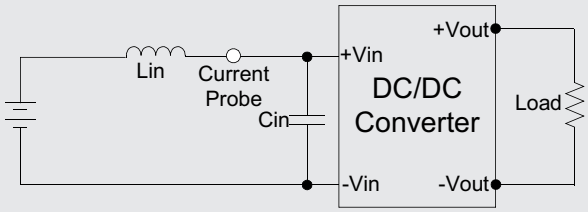
Model Number	Input		Output		Efficiency	Capacitor Load (µF)
	Voltage (VDC) Nom. (Range)	max. Current (mA) full/no load	Voltage (V DC)	Current (mA) max.	@ Full Load (%, Typ.)	max.
RT2-0303S20A4	3.3	650/60	3.3	500	77	470
RT2-0305S20A4	3.3	777/60	5	400	78	470
RT2-0503S20A4	5	446/45	3.3	500	76	470
RT2-0505S20A4	5	513/45	5	400	78	470

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

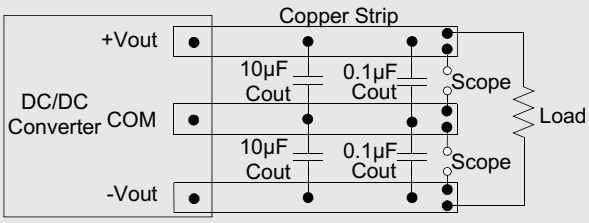
Input Reflected Ripple Current Test Step

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



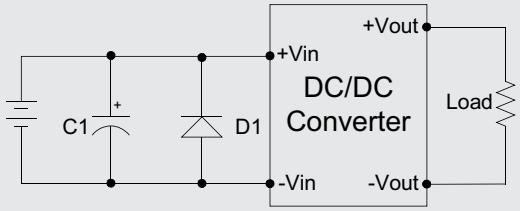
Output Ripple & Noise Measurement Test

Use a 10µF electrolytic capacitor and 0.1µF ceramic capacitor. The scope measurement bandwidth is 0-20MHz.



EFT & Surge Filter

Input components (C1, D1) are used to help meet surge test requirement for the module.

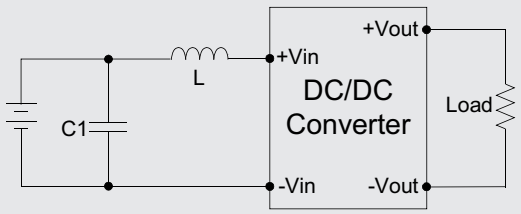


D1:Transient Voltage Suppression Diodes

	C1	D1
3.3 Vin Models	220µF/35V	SMDJ6.0A
5Vin Models	330µF/50V	SMDJ9.0A

EMI Filter

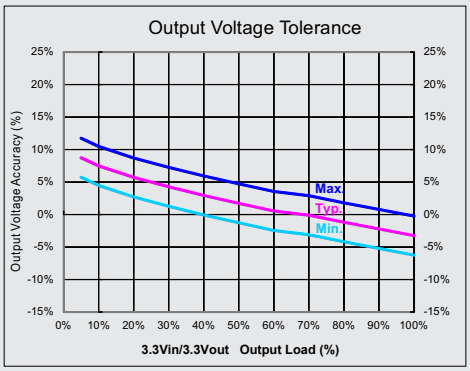
Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module and all leads should be minimized to decrease radiated noise.

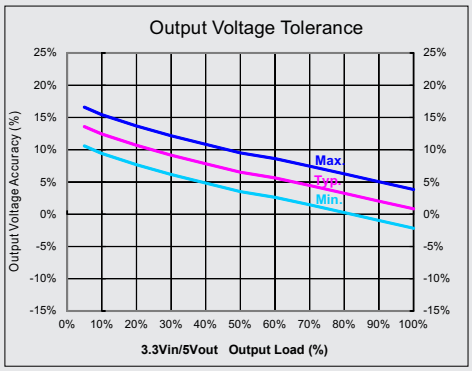


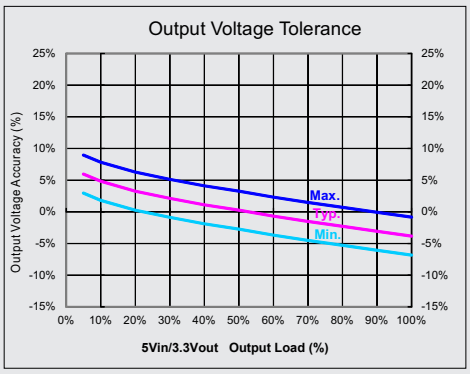
C1	L
1206,22µF/10V	6.8µH

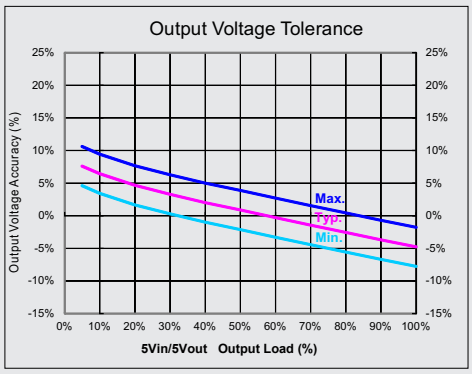
Tolerance Envelope and Efficiency Curves

Tolerance Envelope Curves

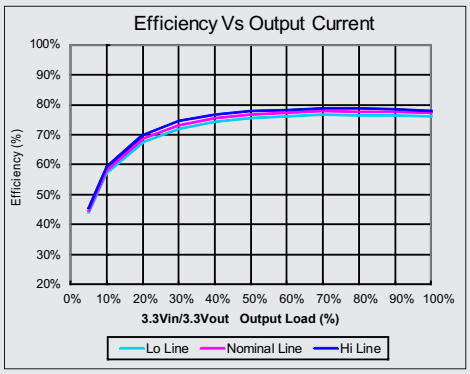


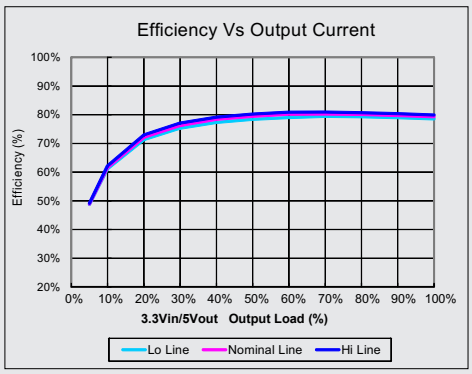


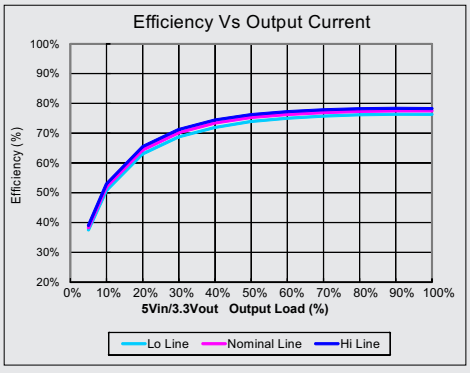


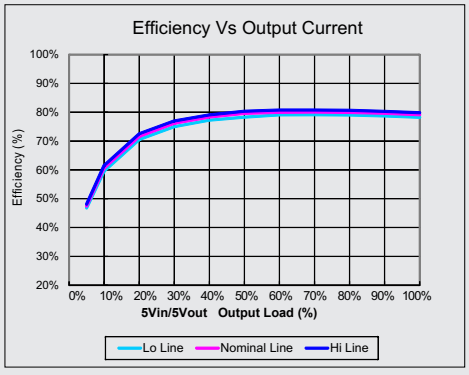


Efficiency vs. Output Curves

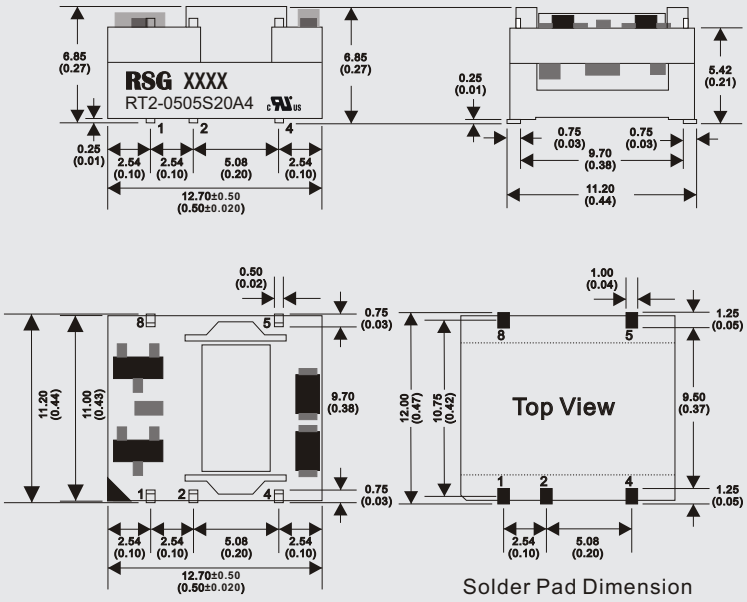








Mechanical Specifications



Pin	Single
1	-Vin
2	+Vin
4	-Vout
5	+Vout
8	N.C.

SMD 8Pin Package

Notes : All dimensions are typical in millimeters (inches).
1. Not marked Tolerances: ±0.25 (±0.01)
2. N.C = No Connection

Notes

1. Ripple/Noise measured with a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
2. Capacitive load is tested at minimal Vin and constant resistive load.
3. Input reflected ripple current is measured with a simulated source inductance of 12μH and a source capacitor Cin (47μF, ESR<1.0Ω at 100kHz).
4. Natural Convection is usually about 30-65 LFM but not equal to still air (0 LFM).
5. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
6. Input filter components are required to help meet conducted emission class B, refer to the EMI Filter of design & feature configuration.
7. Input components (C1, D1) are used to help meet surge test requirement for the module. Recommended C1 is Nichicon UHE series and D1 is Littelfuse SMDJ series.
8. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
9. RT2 converters are not internally fused, to meet UL requirements an anti-surge input line fuse with the following ratings should always be used:
   3.3Vin: 2.0A (Slow Burning Fuse)
   5.0Vin: 1.0A (Slow Burning Fuse)
   All fuses should be UL recognized and rated to at least the maximum allowable DC input voltage.
10. It is not recommended to use water-washing process on these SMT units.

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