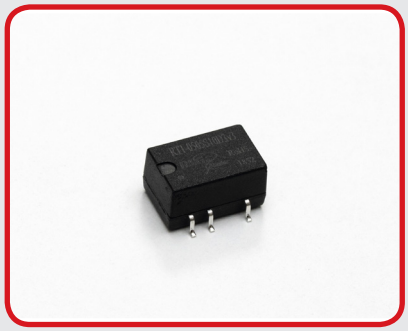
RT1-S10[F]v3

1.0W Unregulated Single Output DC/DC Converter



Picture similar

- **8 Pin (5 or 8) SMD Package**
- **±10% Input Range**
- **1500 or 3000*)VDC Isolation**
- **Very low no-load input current (5mA)**
- **Efficiency up to 85%**
- **High Operating Temperature Range -40°C ~ +105°C**
- **Continuous Short Circuit Protection**
- **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	±1.2 ~ 1.5% max.(per ±1% Vin Change)
Load Regulation	from 10% to 100% Load: 5% to 15% typ.
Cross Regulation (Dual Output)	–
Short Circuit Protection	Continuous, self-recovery
Ripple & Noise (20 MHz bandwidth)	30-50mV typ., 100mV pk-pk max.
Temperature Coefficient	±0.02%/°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	15mA Typ.
Surge Voltage (100 ms) †)	
5V Models	9VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	1500 ~ 3000*)VDC
Out1/Out2 Isolation Voltage (Dual Separate)	–
I/O Isolation Capacitance	20pF typ.
I/O Isolation Resistance	1000M Ohm, min
Switching Frequency	270kHz typ.
Humidity	95% rel H
Reliability Calculated MTBF	>3.5MHrs (MIL-HDBK-217 f)
Safety Standard(s)	–

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. / 217°C <60s (IPC/JEDEC J-STD-020D.1, MSL 1)

Physical Specifications	
Case Material	Black flame-retardant heat-proof epoxy resin (UL94 V-O)
Pin Material SIP Case	–
Pin Material DIP Case	–
Potting Material	Epoxy resin (UL94V-V0)
Weight SIP Case	–
Weight DIP Case	1.4g typ.
Dimensions SIP Case	–
Dimensions DIP Case	0.52" x 0.45" x 0.29"

EMC Specifications	
Radiated / Conducted Emissions	EN55032 Class B see EMI Filter
ESD	IEC 61000-4-2 Perf.Criteria B
Rad. RF	–
EFT	–
Surge	–
Cond. RF	–
PFMF	–
VD/SI/VV	–

*) Full-pin model (Option "F") only available with 1500VDC

†) 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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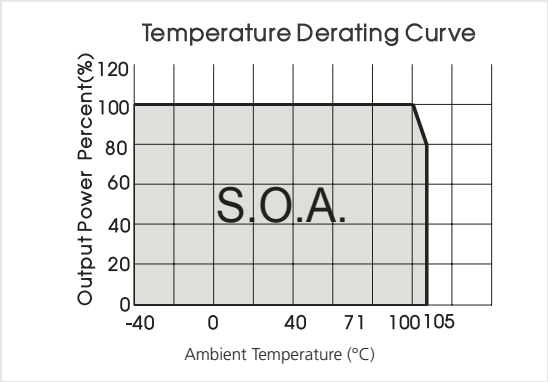
we energize electronics!

Number structure RT1

RT1	–	03	15	S	10	D	1	(F)	(v2)
Name / package		**V-input nom.**	**V-output**	**Output type**	**Power**	**Int. Code**	**Isolation**	**Pin Count**	
RT1 = SMT-8		03 = 3.3 V 05 = 5 V … 24 = 24 V	03 = 3.3 V 05 = 5 V … 24 = 24 V	S = Single	02 = 0.25 W 10 = 1.00 W … 20 = 2.00 W	Logistics Code	1 = 1.5 kV DC 3 = 3.0/3.5 kV DC	_ = 5 pins F = 8 pins	



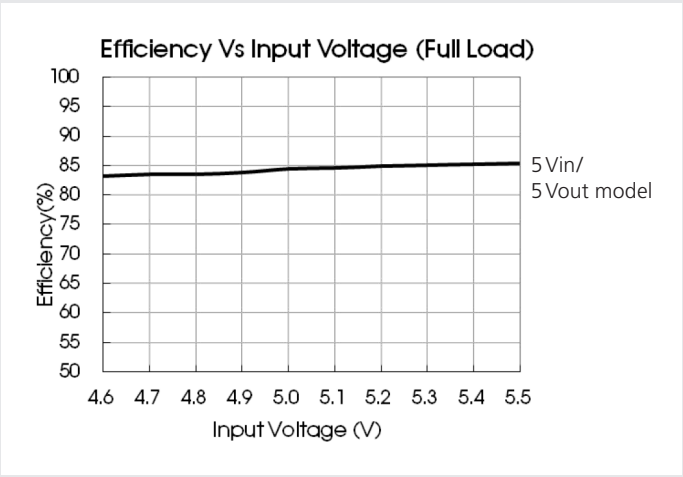
Model Selection Guide

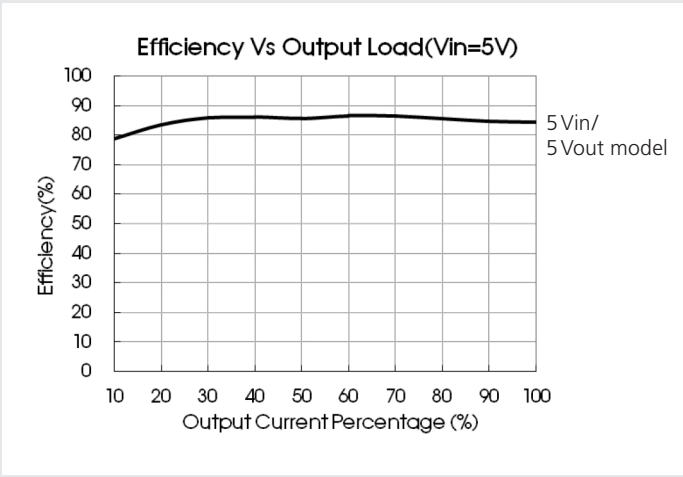
Suffix X = 1 means 1.5 kV DC and X = 3 means 3.0 kV DC Isolation Voltage

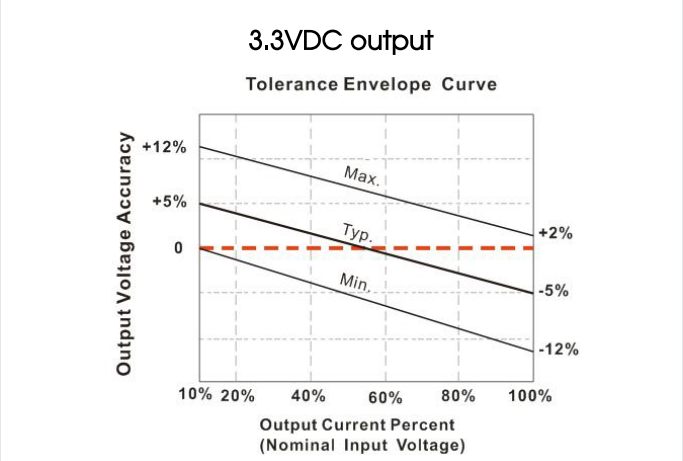
Model Number	Input		Output		Efficiency	Capacitor Load (µF)
	Voltage (VDC) Nom. (Range)	max. Current (mA) full/no load	Voltage (V DC)	Current (mA) max./min.	@ Full Load (%, Min./Typ.)	max.
RT1-0503S10DX[F]*)v3	5 (4.5~5.5)	286/10	3.3	303/30	70/74	2400
RT1-0505S10DX[F]*)v3	5 (4.5~5.5)	286/10	5	200/20	78/82	2400
RT1-0509S10DX[F]*)v3	5 (4.5~5.5)	254/20	9	111/12	79/83	1000
RT1-0512S10DX[F]*)v3	5 (4.5~5.5)	254/20	12	84/9	79/83	560
RT1-0515S10DXv3	5 (4.5~5.5)	254/30	15	67/7	79/83	560
RT1-0524S10DXv3	5 (4.5~5.5)	254/30	24	42/4	81/85	220

*) Full-pin model (Option "F") only available with 1500VDC 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

Electrical Characteristic Curves







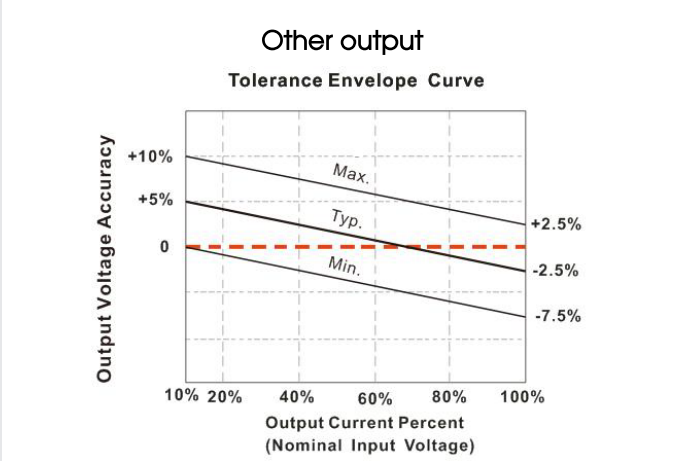


Fig. 1

Design Reference

1. Typical application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.3. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in table below.

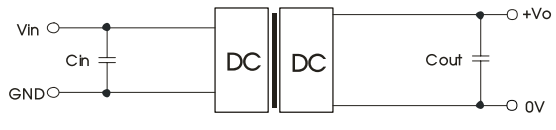


Fig.3

Recommended capacitive load value table (Table 1)			
Vin (VDC)	Cin (μF)	V_o (VDC)	Cout (μF)
5	4.7	3.3/5	10
		9	4.7
		12	2.2
		15	1
		24	0.47

2. EMC solution-recommended circuit

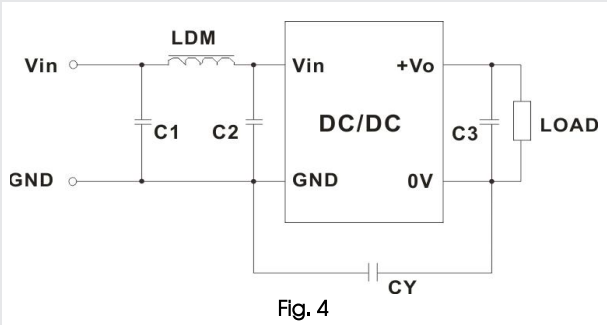


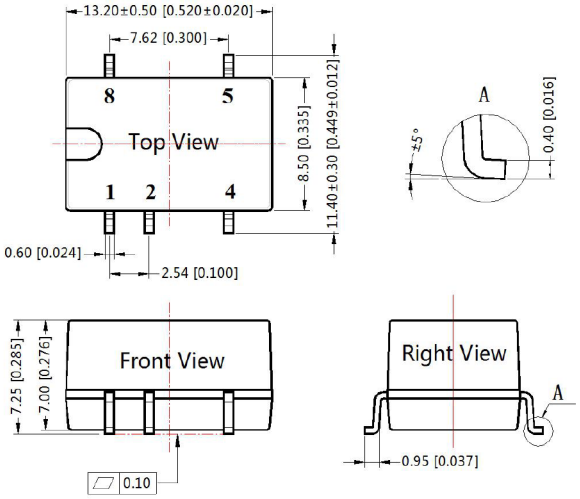
Fig. 4

EMC recommended circuit value table (Table 2)					
Input voltage	Output voltage		3.3/5/9	12/15/24 (1.5 kVDC models)	12/15/24 (3.0 kVDC models)
5 VDC	EMI	C1/C2	4.7 μF/25 V		
		CY	–	1 nF/2 kVDC HEC C1206X102K202T JOHANSON 202R18W102KV4E	1 nF/4 kVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
		L3	Refer to the Cout in table 1		
		LDM	6.8 μH		

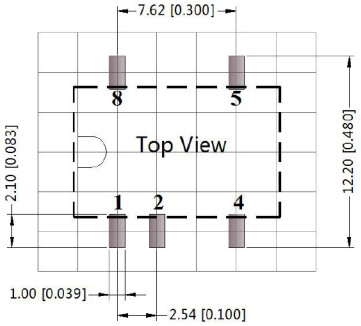
Note: In the case of actual use, the requirements for EMI are high, it is subject to CY.

Mechanical Specifications

THIRD ANGLE PROJECTION



Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: Pin to be isolated from circuitry
Note: Full-pin model (Option "F") features pins 3, 6 and 7, which are NC.

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.

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