RT1-S10v2

1.0W Unregulated Single Output DC/DC Converter

Picture similar

- **8 Pin (5) SMD Package**
- **±10% Input Range**
- **1500 or 3000VDC Isolation**
- **High efficiency designs**
- **Efficiency up to 80%**
- **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 18% typ. –
Cross Regulation (Dual Output)	–
Short Circuit Protection	Continuous, self-recovery, not for RT1-03xx, 24xx, 0524
Ripple & Noise (20 MHz bandwidth)	60mV typ., 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	15mA Typ.
Surge Voltage (100 ms) †)	
3.3V Models 5V Models 12V Models 15V Models 24V Models	5VDC max. 9VDC max. 18VDC max. 21VDC max. 30VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	1500 ~ 3000VDC
Out1/Out2 Isolation Voltage (Dual Separate)	–
I/O Isolation Capacitance	20pF 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)	–

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	1.6g typ.
Dimensions SIP Case	–
Dimensions DIP Case	0.50" x 0.44" 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	–

†) 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.

RSG Electronic Components GmbH
Sprendlinger Landstr. 115
D-63069 Offenbach, Germany

Tel. +49 69 984047-0
Fax +49 69 984047-77
info@rsg-electronic.de
www.rsg-electronic.de

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Fig. 1
Temperature Derating Curve

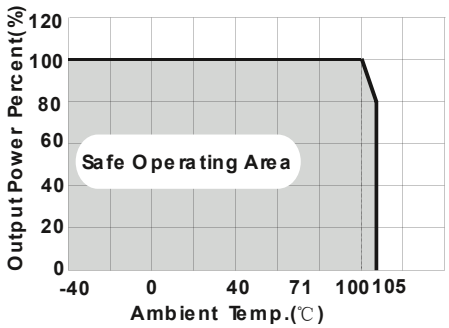

Fig. 2

Model Selection Guide

Part No.	Input Voltage (VDC) Nominal (Range)	Output Voltage (VDC)	Output Current (mA)(Max./Min.)	Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load (µF)
RT1-0303S10DXv2	3.3 (2.97-3.63)	3.3	303/30	65/69	220
RT1-0305S10DXv2		5	200/20	70/74	
RT1-0309S10DXv2		9	111/12	76/80	
RT1-0312S10DXv2		12	84/9	76/80	
RT1-0315S10DXv2		15	67/7	76/80	
RT1-0324S10DXv2		24	42/4	76/80	
RT1-0503S10DXv2	5 (4.5-5.5)	3.3	303/30	68/72	
RT1-0505S10DXv2		5	200/20	76/80	
RT1-0506S10DXv2		6	167/17	76/80	
RT1-0509S10DXv2		9	111/12	76/80	
RT1-0512S10DXv2		12	84/9	76/80	
RT1-0515S10DXv2		15	67/7	76/80	
RT1-0524S10DXv2		24	42/4	76/80	
RT1-1203S10DXv2	12 (10.8-13.2)	3.3	303/30	68/72	
RT1-1205S10DXv2		5	200/20	76/80	
RT1-1209S10DXv2		9	111/12	76/80	
RT1-1212S10DXv2		12	84/9	76/80	
RT1-1215S10DXv2		15	67/7	76/80	
RT1-1224S10DXv2		24	42/4	76/80	
RT1-1505S10DXv2	15 (13.5-16.5)	5	200/20	76/80	
RT1-1509S10DXv2		9	111/12	76/80	
RT1-1515S10DXv2		15	67/7	76/80	
RT1-2403S10DXv2	24 (21.6-26.4)	3.3	303/30	67/71	
RT1-2405S10DXv2		5	200/20	76/80	
RT1-2409S10DXv2		9	111/12	76/80	
RT1-2412S10DXv2		12	84/9	76/80	
RT1-2415S10DXv2		15	67/7	76/80	
RT1-2424S10DXv2		24	42/4	76/80	

Note: Suffix „X" =
1 for 1.5kVDC Isoloation, 3 for 3.0kVDC Isoloation

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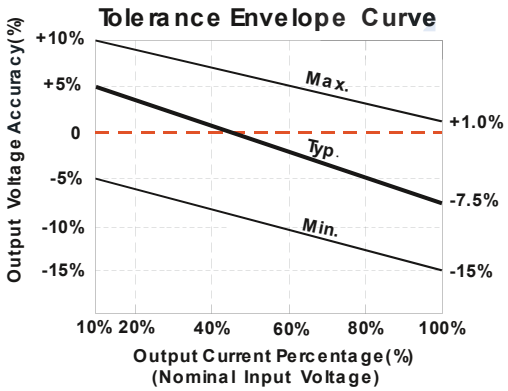
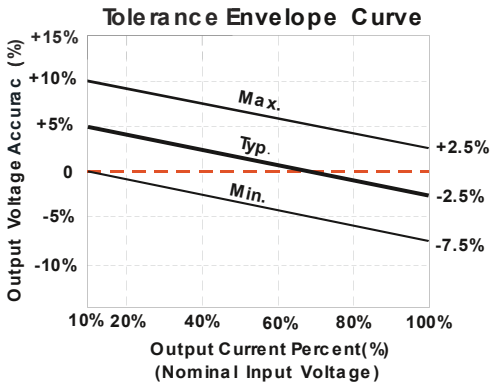
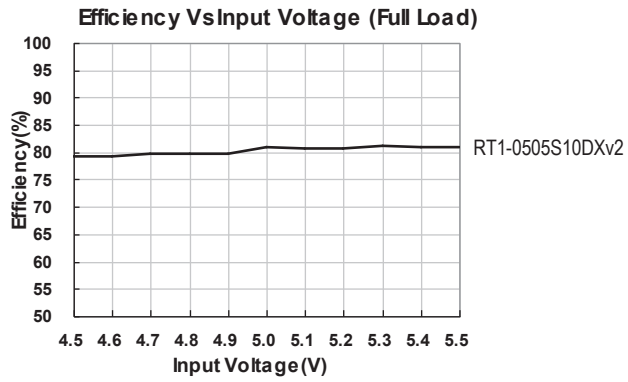
Product Characteristic Curve

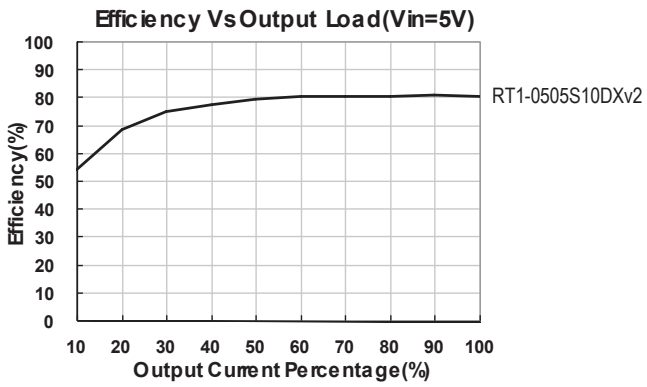
3.3VDC output

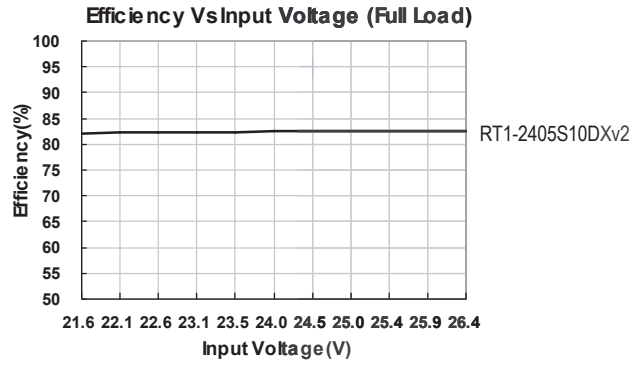


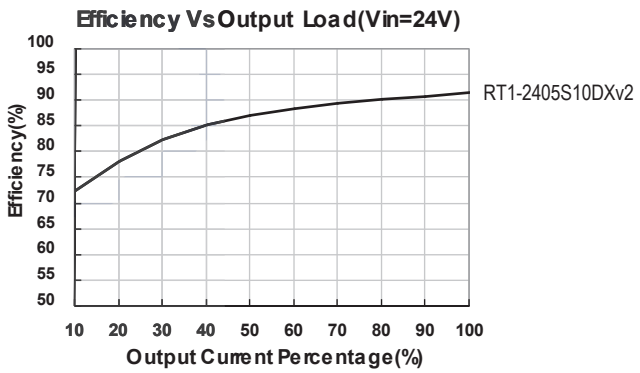
Other output











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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 1.

Fig.3

Recommended capacitive load value table (Table 1)

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
3.3	4.7	3.3	10
5	4.7	5/6	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1
--	--	24	0.47

2. EMC solution-recommended circuit

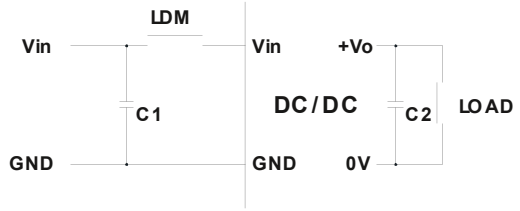

Fig. 4

Input voltage (VDC)		3.3/5/12/15/24
EMI	C1	4.7μF /50V
	C2	Refer to the Cout in Fig.3
	LDM	6.8μH

3. Output load requirements

When using, the minimum load of the module output should not be less than 10% of the nominal load. In order to meet the performance parameters of this datasheet, please connect a 10% dummy load in parallel at the output end, the dummy load is generally a resistor, Please note that the resistor needs to be used in derating.

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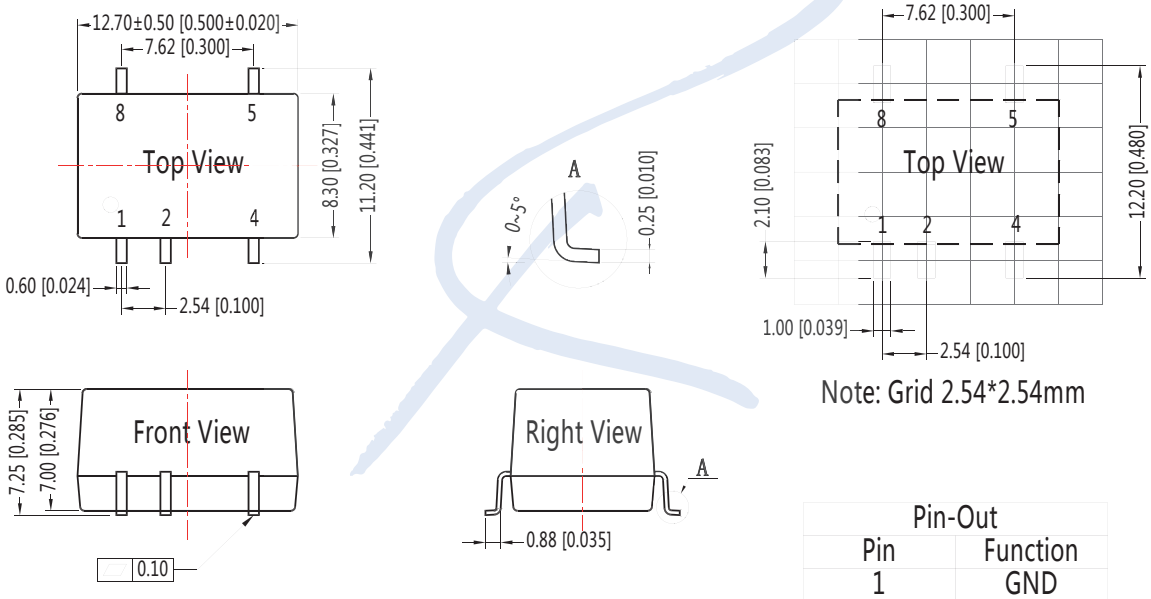
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

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

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

NC: No Connection

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;
The maximum capacitive load offered were tested at nominal input voltage and full load;
Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
All index testing methods in this datasheet are based on our Company´ s corporate standards;
The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
We can provide product customization service;
Specifications are subject to change without prior notice.

The models listed here are just standard type. If you need a product with special specification or you have questions regarding packing standards (Tube oder Tape/Reel) as well as application support, please contact our specialists: sales@rsg-electronic.de or +49 69-984047-41/-28

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