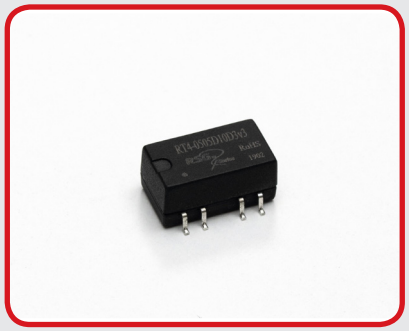
RT4-D10v3

1.0W Unregulated Dual Output DC/DC Converter



Picture similar

- **10 Pin (6) SMD Package**
- **±10% Input Range**
- **1500 or 3000VDC Isolation**
- **EMI Complies with EN55032 Class B**
- **Efficiency up to 85%**
- **High Operating Temperature Range -40°C ~ +105°C**
- **Continuous Short Circuit Protection**
- **No-load input current as low as 5mA**
- **Non Conductive Black Plastic Case**

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: 5% to 10% typ. –
Cross Regulation (Dual Output)	–
Short Circuit Protection	Continuous, self-recovery
Ripple & Noise (20 MHz bandwidth)	30mV - 50mV Ripple & Noise pk-pk typ.
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) †)	

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	270kHz
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	Non-conductive Black Plastic (UL94V-0 rated)
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	0.60" 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.

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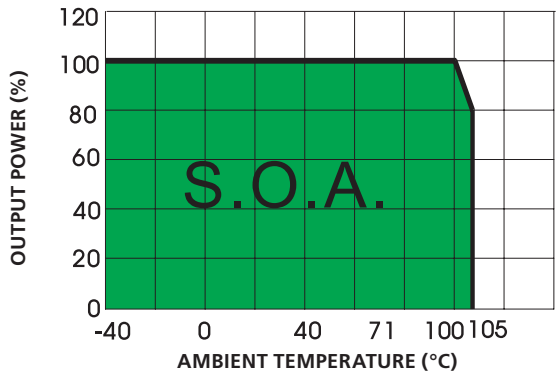
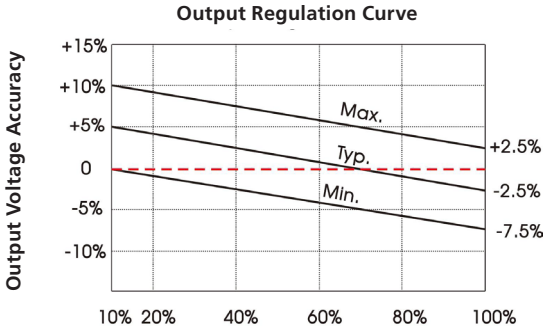
Number structure RT4

RT4	–	05	12	_	D	10	D	1	(v3)
Name / package		**V-input nom.**	**V-output**	**Regulation**	**Output type**	**Power**	**Int. Code**	**Isolation**	
RT4 = SMT-10		03 = 3.3 V 05 = 5 V … 24 = 24 V	05 = 5 V 09 = 9 V … 24 = 24 V	_ = unreg.	D = Dual	10 = 1.00 W	Logistics Code	1 = 1.5 kV DC 3 = 3.0 kV DC	

Derating Curve



Electrical Characteristic Curves

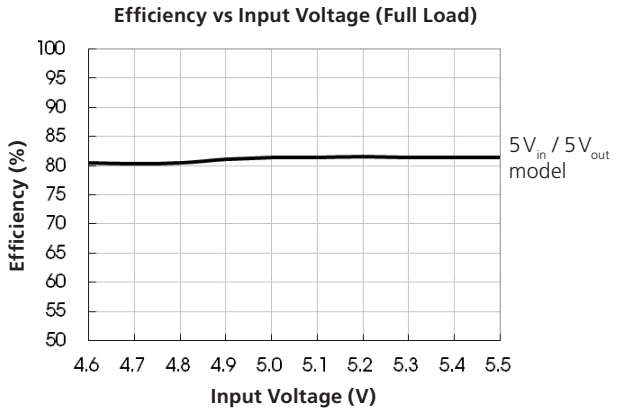


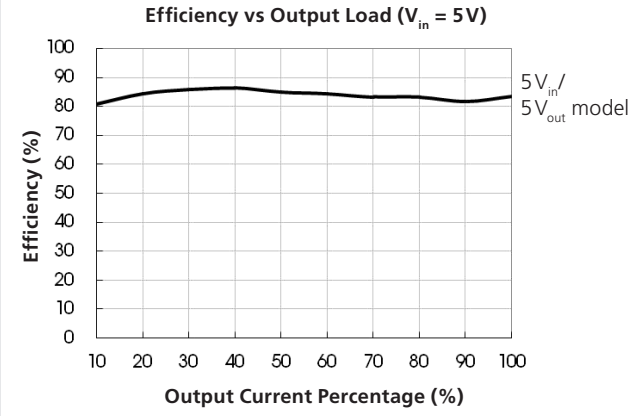
Model Selection Guide

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.
RT4-0505D10DXv3	5 (4.5~5.5)	257/10	±5	±100/±10	78/82	1200
RT4-0509D10DXv3	5 (4.5~5.5)	254/20	±9	±56/±6	79/83	470
RT4-0512D10DXv3	5 (4.5~5.5)	254/20	±12	±42/±5	79/83	220
RT4-0515D10DXv3	5 (4.5~5.5)	254/30	±15	±34/±4	79/83	220
RT4-0524D10DXv3	5 (4.5~5.5)	254/30	±24	±21/±3	81/85	100

Electrical Characteristic Curves





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

Design Reference

1. Typical application circuit

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.
The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Fig. 4).

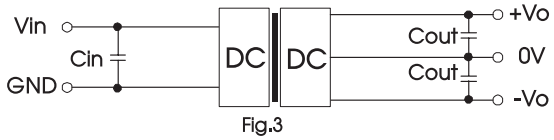


Fig.3

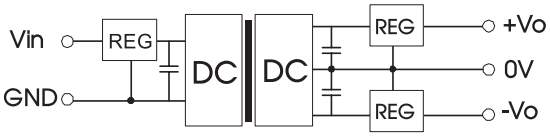


Fig.4

Recommended capacitive load value table (Table 1)			
V_{in} (VDC)	C_{in} (μF)	V_0 (VDC)	C_{out} (μF)
5	4.7	±5	4.7
		±9	2.2
		±12	1
		±15 / ±24	1

2. EMC compliance circuit

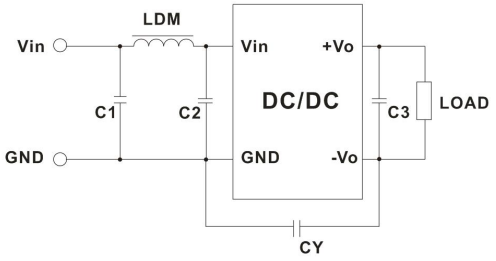
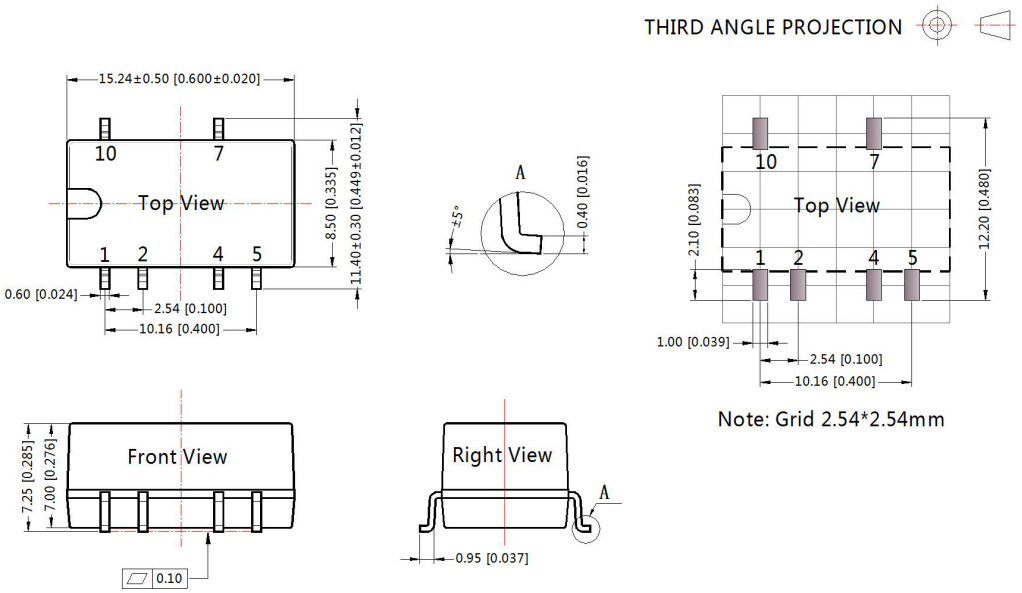


Fig. 5

EMC recommended circuit value table (Table 2)					
Input voltage	Output voltage		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
		C3	Refer to the C_{out} in table 1		
		LDM	6.8 μH		

Mechanical Specifications



Note: Grid 2.54*2.54mm

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

Pin	
1	GND
2	V Input
4	0V
5	–V Output
7	+V Output
10	N C

NC: Pin to be isolated from circuitry

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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