

RT9-RS30D1v2

SMD - DIP 16 Package

- Wide range of input voltage (2:1)
- Ultra-small size, SMD package
- 1.5KVDC isolation
- Short circuit protection(automatic recovery)
- Operating temperature range:-40°C ~ +85°C
- High power density
- Meet UL94-V0
- EN60950 Approval



RoHS

The RT9-RS30D1v2 series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board. These products apply to where:

- 1) These products apply to where: Input voltage ranges≤2:1;
- 2) 1.5KV input and output isolation;
- 3) Regulated and low ripple noise is required.

SELECTION GUIDE

Certification	Part No.	Input Voltage (VDC)		Output		Efficiency (%Min/Typ.) @ Full Load	Max. Capacitive Load [®] (µF)
		Nominal (Range)	Max. ①	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
RoHS	RT9-1203RS30D1v2	12 (9-18)	22	3.3	909/46	72/74	3700
	RT9-1205RS30D1v2			5	600/30	73/75	3300
	RT9-1212RS30D1v2			12	250/12	75/77	1800
	RT9-1215RS30D1v2			15	200/10	77/79	1000
	RT9-2403RS30D1v2	24 (18-36)	40	3.3	909/46	72/74	3700
	RT9-2405RS30D1v2			5	600/30	74/76	3300
	RT9-2412RS30D1v2			12	250/12	79/81	1800
	RT9-2415RS30D1v2			15	200/10	78/80	1000
	RT9-4805RS30D1v2	48 (36-75)	80	5	600/30	75/77	3300
	RT9-4812RS30D1v2			12	250/12	78/80	1800
	RT9-4815RS30D1v2			15	200/10	78/80	1000

Note:

- ①. Absolute maximum rating without damage on the converter, but it isn't recommended;
- ②. For dual output converter, the given value is the same for each output.

INPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input current	12VDC input	--	334/18	343/25	mA
	24VDC input	--	165/10	169/14	
	48VDC input	--	82/5	84/18	
Input Surge Voltage (1sec. max.)	12VDC input	-0.7	--	25	VDC
	24VDC input	-0.7	--	50	
	48VDC input	-0.7	--	100	
Starting Voltage	12VDC input	4.5	8	9	VDC
	24VDC input	11	16	18	
	48VDC input	24	33	36	
Input Filter		Pi filter			
Hot Plug		Unavailable			

OUTPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5% to 100% load	--	±1	±3	%

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No load output Voltage Accuracy	Vo ≤ 5V	--	±1.5	±5	
	Vo > 5V	--	±1.5	±3	
Linear Regulation	Full load, the input voltage is from low voltage to high voltage	--	±0.2	±0.4	
Load Regulation	5%-100% load	--	±0.2	±0.75	
Transient Recovery Time	25% load step change	--	0.5	1	ms
Transient Response Deviation		--	±2	±5	%
Temperature Coefficient	Full load	--	±0.02	±0.03	%/°C
Ripple & Noise*	20MHz bandwidth	--	45	60	mV p-p
Short circuit Protection	Continuous, self-recovery				

Note: *Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation.

GENERAL SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1	--	nF
Operating Temperature	Derating if the temperature is e85°C (see Fig. 1)	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Casing Temperature Rise	Ta=25°C	--	+25	--	
Hand Soldering	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	+300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency(PFM mode)	100% load, nominal input voltage	--	350	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours
Reflow Soldering Temperature		Peak temp. ≤ 240°C, maximum duration time ≤ 60s at 217°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			

PHYSICAL SPECIFICATIONS

Casing Material	Black flame-retardant and heat-proof epoxy resin (UL94-V0)
Dimensions	23.86*13.70*7.50 mm
Weight	5.2g(Typ.)
Cooling	Free convection

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B/CLASS B (see Fig.3 for recommended circuit)		
	RE	CISPR22/EN55022 CLASS B/CLASS B (see Fig.3 for recommended circuit)		
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (see Fig.3 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	±2KV (see Fig.3 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29	0-70%	perf. Criteria B

PRODUCT CHARACTERISTIC CURVE

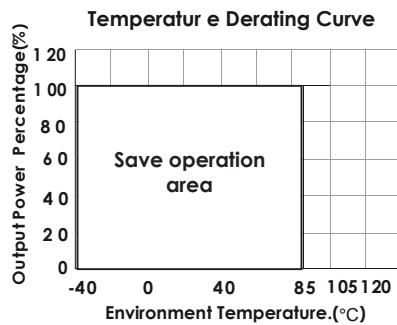
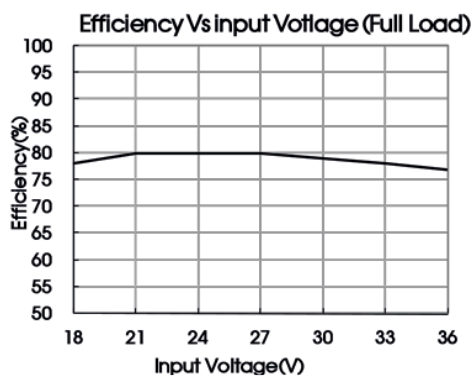
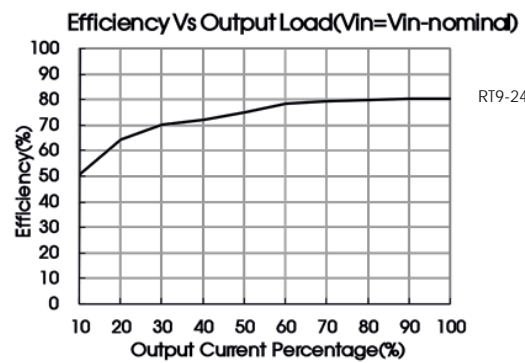


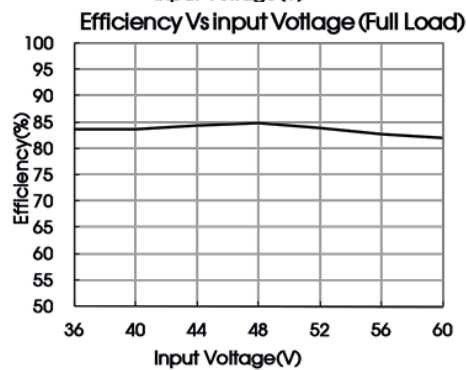
Fig. 1



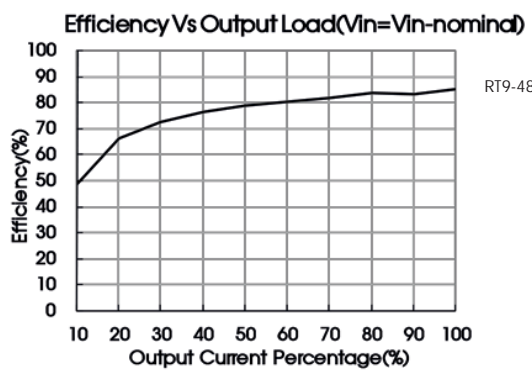
RT9-2405RS30D1V2



RT9-2405RS30D1V2



RT9-4815RS30D1V2



RT9-4815RS30D1V2

DESIGN REFERENCE

1. Outputload requirements

To ensure that the module can work efficiently and reliably, its output min. load shall be no lower than 5% of the rated load when using, or the output ripple may increase rapidly. Ensure that the product working load must be higher than 5% of the rated load.

2. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

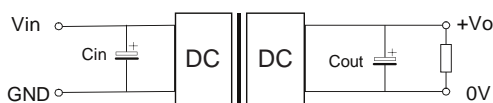


Fig. 2

Vin	12V	24V&48V
Cin	100µF	10µF~47µF
Cout	10µF	

3. EMC solution-recommended circuit

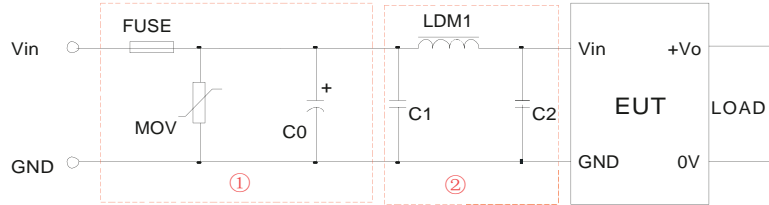


Fig. 3

Parameter description:

Model	Vin:12V	Vin:24V	Vin:48V
FUSE	Choose according to practical input current		
MOV	--	S14K35	S14K60
LDM1	12 μ H		
C0	680 μ F/25V	120 μ F/50V	120 μ F/100V
C1	4.7 μ F/50V		4.7 μ F/100V
C2	4.7 μ F/50V		4.7 μ F/100V

Note: ①.Part ① in the Fig. 3 is used for EMS test and part ② for EMI filtering; selected based on needs.

②.If there is no recommended parameters, the model no require the external component.

EMC solution-recommended circuit PCB layout

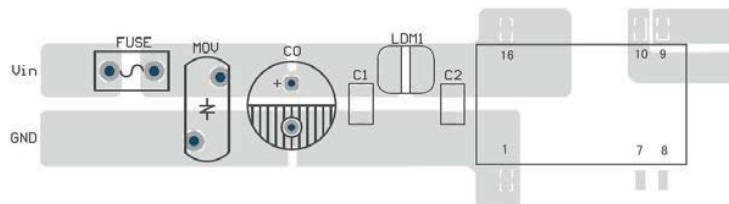


Fig. 4

4. Input current

When it is used in unregulated power supply, be sure that the fluctuating range of the power supply and the rippled voltage do not exceed the module standard. Input current of power supply should afford the flash startup average current of this kind of DC/DC module (Figure 2).

General: Vin:12V I_{ave} =640mA
 Vin:24V I_{ave} =316mA
 Vin:48V I_{ave} =156mA

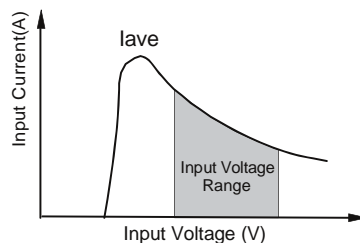


Fig. 5

5. It is not recommended to increase the output power capability by connecting two or more converters in parallel.

The models listed above are standard types. If you need special specifications or have questions regarding packing (Tube or Tape&Reel) or need application support, please contact our specialists: sales@rsg-electronic.de or +49 69-984047-0