

2W, DC/DC Power Converter

SDM02T



Introduction

The SDM02T series are unregulated DC/DC converters offered in compact SMD package with 1.5KVDC isolation. These converters feature high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range -40 ~ +105°C. They are widely used in distributed power system in industrial applications where isolation and voltage converting is needed.

Features

- Rated power: 2W max
- Input voltage range $\pm 10\%$
- Unregulated output
- High efficiency up to 85%
- Isolation voltage 1.5KVDC
- Small no load input current
- Operating temperature range: -40 ~ +105°C ambient
- RoHS compliant
- Industrial standard SMD package
- Continuous short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty

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Part numbers

Model Number	Input Voltage [VDC] $\pm 10\%$	Output Voltage (VDC)	Output Current (mA) Max	Output Current (mA) Min	Efficiency (%) Typ.	Capacitive Load (μ F) Max.
SDM02T0505	5	5	400	40	83	2400
SDM02T0507	5	7	286	29	84	1000
SDM02T0509	5	9	222	22	84	1000
SDM02T0512	5	12	167	17	84	560
SDM02T0515	5	15	133	13	84	560
SDM02T0524	5	24	83	8	84	220
SDM02T1205	12	5	400	40	83	2400
SDM02T1209	12	9	222	22	84	1200
SDM02T1212	12	12	167	17	84	560
SDM02T1215	12	15	133	13	84	560
SDM02T1224	12	24	83	8	84	220
SDM02T1505	15	5	400	40	83	2400
SDM02T1509	15	9	222	22	84	1200
SDM02T1512	15	12	167	17	84	560
SDM02T1515	15	15	133	13	84	560
SDM02T1524	15	24	83	8	84	220
SDM02T2405	24	5	400	40	83	2400
SDM02T2409	24	9	222	22	83	1200
SDM02T2412	24	12	167	17	84	560
SDM02T2415	24	15	133	13	85	560
SDM02T2424	24	24	83	8	85	220

* Only typical models are listed. Other models may be available upon request.

* Operating with less than 10% of rated load will not cause permanent damage to the converters, but the performances data may not fall into the specifications, and reliable operating is not assured.

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Electrical characteristics

Unless otherwise indicated, specifications are measured at $T_A=25^{\circ}\text{C}$, nominal input voltage, full load after warm up.

Parameter	Condition	Min.	Type	Max.	Unit	Note
Input current Full load	V _{IN} =5V	-	477	-	mA	
	V _{IN} =12V		196			
	V _{IN} =15V		161			
	V _{IN} =24V		98			
Input current No load		-	8	-	mA	
Reflected Ripple Current		-	30	-	mA	
Surge voltage 1 second max	V _{IN} =5V	-0.7	-	9	VDC	
	V _{IN} =12V	-0.7		18		
	V _{IN} =15V	-0.7		21		
	V _{IN} =24V	-0.7		30		
Output voltage accuracy	All models	Refer to graphic in “Characteristic Curves” section				
Line regulation For V _{IN} change of ±1%		-	-	±1.2	%	
Load regulation I _{OUT} =10% to 100% of I _{OUT, rated}	V _{OUT} =5V	-	10	15	%	
	V _{OUT} =7V		8	12		
	V _{OUT} =9V		8	10		
	V _{OUT} =12V		7	10		
	V _{OUT} =15V		6	10		
	V _{OUT} =24V		6	10		
Temperature coefficiency	Full load	-	±0.02	-	%/°C	

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Output ripple and noise	20MHz bandwidth	-	50	150	mVp-p	
Output short circuit protection		Continuous, automatic recovery				
Input filter		Capacitor				
Hot plug		None				

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current <1mA	Input to Output	1500	-	-	VDC
Isolation resistance Tested at 500VDC	Input to Output	1000	-	-	M ohm
Isolation capacitance 100KHz, 0.1V	Input to Output	-	20	-	pF
Operating temperature	See "Derating Curve"	-40	-	+105	°C
Storage temperature		-55	-	+125	°C
Temperature rise at case	Full load	-	25	-	°C
Storage humidity	Non-condensing	5	-	95	%RH
Switching frequency	Full load	-	260	-	KHz
Reflow soldering temperature		Peak temp. 217 - 245°C, maximum duration 60s			
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z			
Cooling method		Free air convection			
Design based on standards		IEC/EN/UL 62368-1			
Safety certifications		IEC/EN 62368-1			
EMC	Emissions Immunity	CISPR32, EN55032 Class B* IEC/EN61000-4-2, air ±8kV, contact ±4kV			

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MTBF	MIL-HDBK-217F	>3,500,000 Hours, T _A =25°C
Moisture sensitivity level (MSL)		IPC/JEDEC J-STD-020D.1 Level 1
Size		13.5 x 11 x 7.25 mm
Weight		1.6g Typ.

*External circuit is required in order to meet Class B, refer to Figure 2 in Recommended External Circuit.

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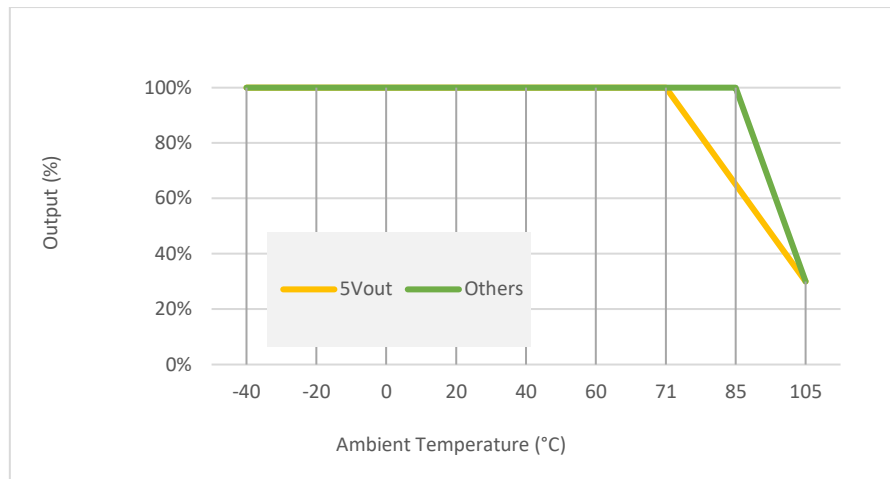
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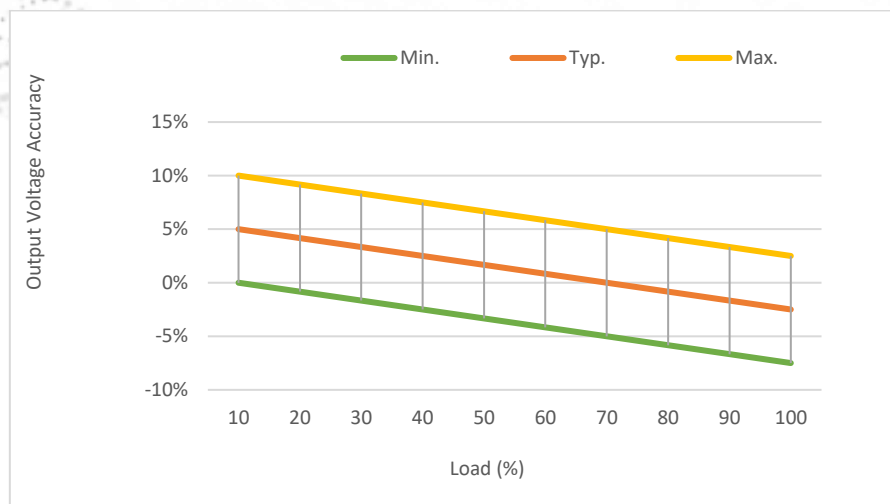
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



Output Voltage Accuracy vs Load



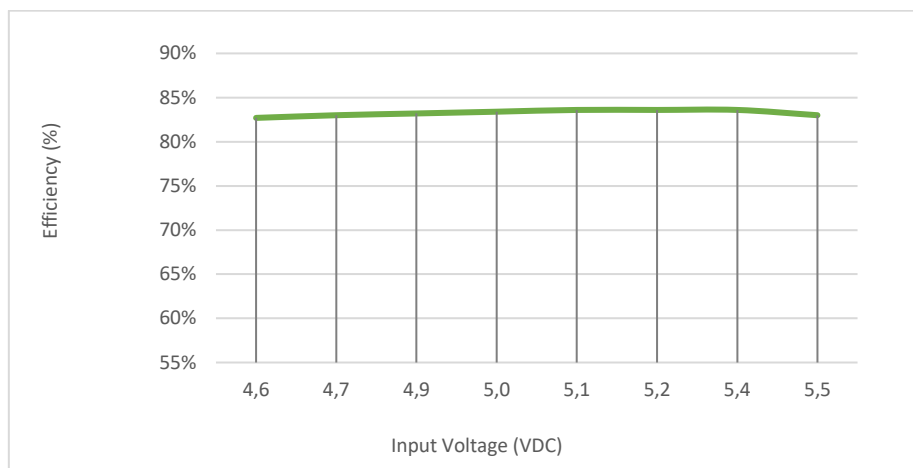
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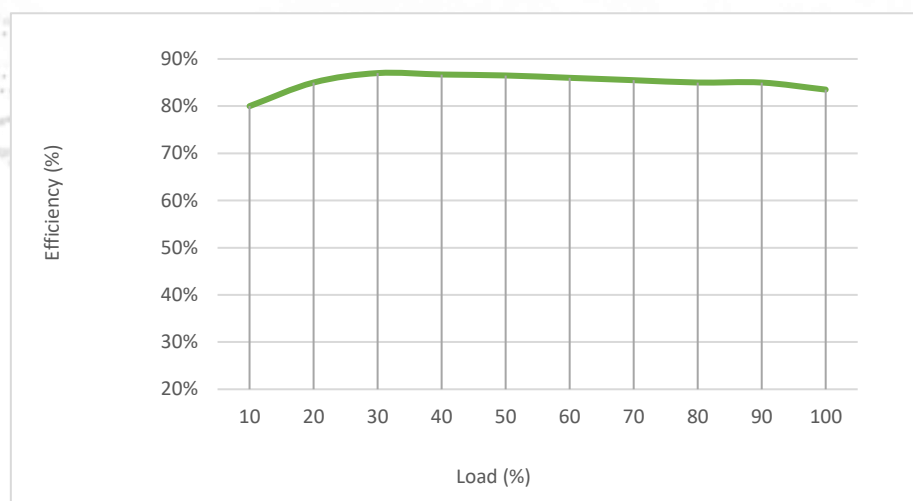
Efficiency Curves

Efficiency vs Input Voltage



SDM02T0505, with full Load

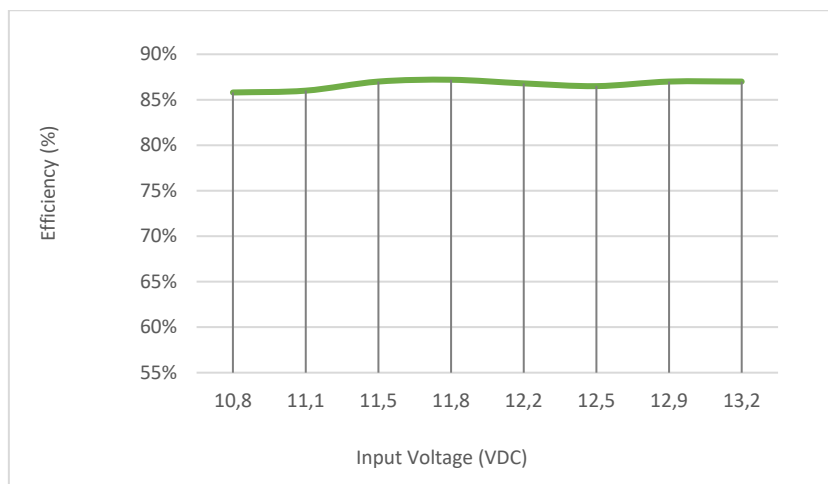
Efficiency vs Load



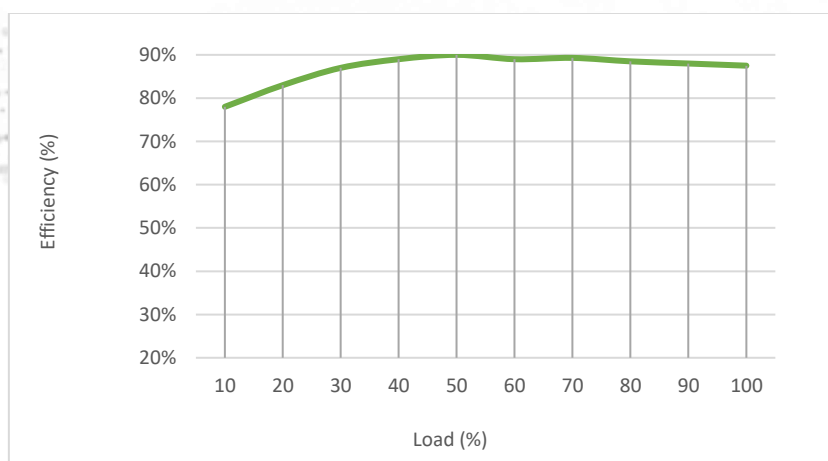
SDM02T0505, with nominal input voltage

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SDM02T1205, with full Load



SDM02T1205, with nominal input voltage

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Recommended External Circuit

Typical Application Circuit

*Typical application circuit is to further lower the input and output ripple. It is not required for general use.

*Recommended component specifications are typical values. Excessive external capacitive load may cause startup problem.

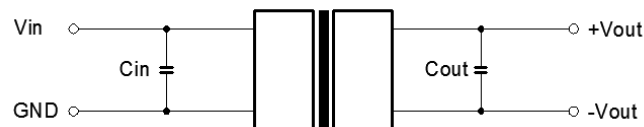


Figure 1: Typical External circuit

Recommended component spec

Input voltage	5V	12V	15V	24V
C_{IN}	4.7uF, 16V	2.2uF, 25V	1uF, 25V	1uF, 50V

Recommended component spec

Output voltage	5V	9V	12V	15V	24V
C_{OUT}	10uF, 16V	2.2uF, 25V	2.2uF, 25V	1uF, 25V	0.47uF, 50V

EMC Enhancement for EN55032 Class B

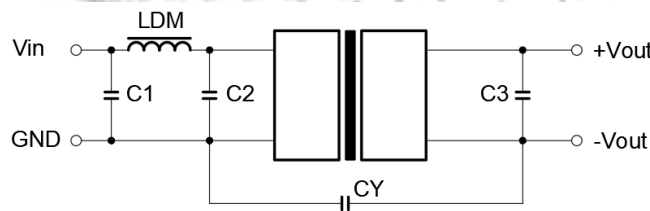


Figure 2: Circuit for EMC Enhancement

Recommended component spec

Component	LDM	C1, C2	CY	C3
C_{OUT}	6.8uH	4.7uF, 50V	270pF, 2KV	Refer to C_{OUT} in [Table 2]

*CY is omitted for 5V_{IN} models, with V_{OUT} = 3.3 ... 9V

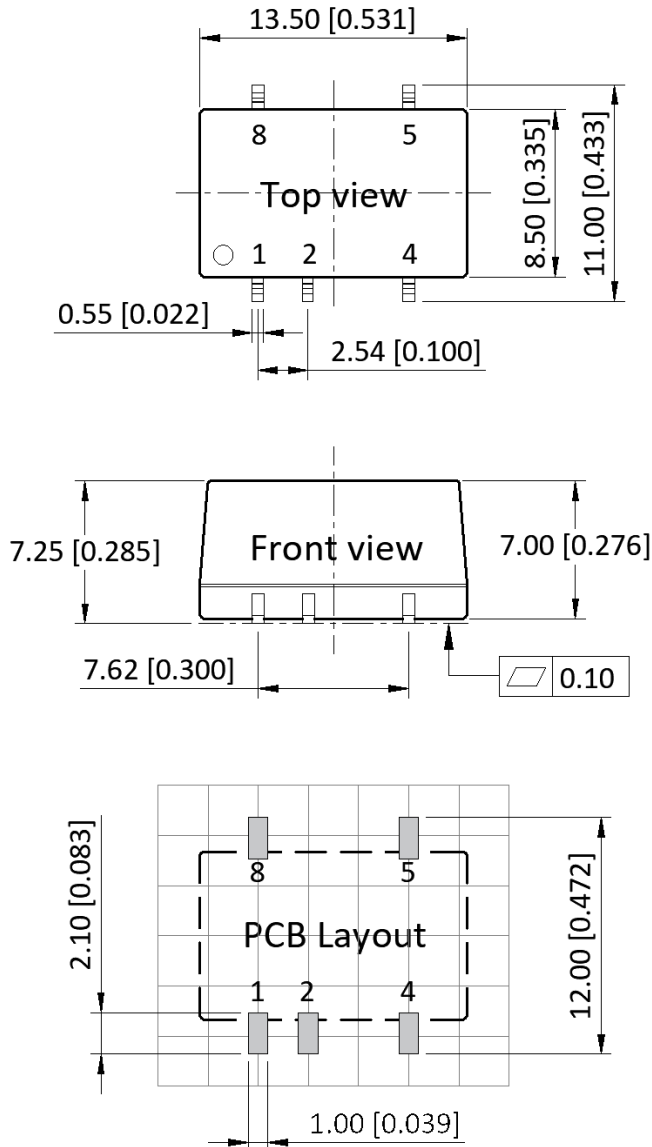
*C3 refer to C_{OUT} in

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Mechanical Specifications



Pin Definition

Pin #	Single Out	
1	GND	
2	V _{IN}	
4	0V	
5	+V _{OUT}	
8	No connection	

* Unless otherwise specified unit:
mm [inch]

* General tolerance: ± 0.50 [± 0.020]

* Pin thickness: ± 0.10 [± 0.004]

* Footprint grid 2.54 x 2.54 mm

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Ordering information

Ordering can be done via www.summit-electronics.com or via info@summit-electronics.com. Please contact us for more information. Customisation of the product is available on request.

Technical support

For all product questions please contact us via info@summit-electronics.com

Document revision

Rev	Date	Changes
2025v0.1	27-08-2025	First issue of document