1W, DC/DC Power Converter

SDM01T

Introduction

The SDM01T 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: 1W max
- Input voltage range ±10%
- Unregulated single output
- High efficiency up to 88%
- Isolation voltage 1.5KVDC
- Small no load input current
- Operating temperature range: -40 ~ +105°C ambient
- RoHS compliant
- Compact SMD package
- Continuous short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty

1W, DC/DC Power Converter
SDM01T

Part numbers

Model Number	Input Voltage [VDC] ±10%	Output Voltage (VDC)	Output Current (mA) Max	Output Current (mA) Min	Efficiency (%) Typ.	Capacitive Load (uF) Max.
SDM01T0303	3.3	3.3	303	0	80	3000
SDM01T0305	3.3	5	200	0	82	3000
SDM01T0309	3.3	9	111	0	83	1200
SDM01T0312	3.3	12	84	0	84	820
SDM01T0315	3.3	15	67	0	84	680
SDM01T0324	3.3	24	42	0	84	330
SDM01T0503	5	3.3	303	0	82	3000
SDM01T0505	5	5	200	0	85	3000
SDM01T0509	5	9	111	0	86	1200
SDM01T0512	5	12	84	0	86	820
SDM01T0515	5	15	67	0	86	680
SDM01T0524	5	24	42	0	87	330
SDM01T1203	12	3.3	303	0	82	3000
SDM01T1205	12	5	200	0	85	3000
SDM01T1209	12	9	111	0	86	1200
SDM01T1212	12	12	84	0	86	820
SDM01T1215	12	15	67	0	86	680
SDM01T1224	12	24	42	0	88	330
SDM01T1505	15	5	200	0	86	3000
SDM01T1512	15	12	84	0	87	820
SDM01T1515	15	15	67	0	88	680
SDM01T2403	24	3.3	303	0	82	3000

SDM01T2405	24	5	200	0	85	3000
SDM01T2409	24	9	111	0	86	1200
SDM01T2412	24	12	84	0	87	820
SDM01T2415	24	15	67	0	87	680
SDM01T2424	24	24	42	0	88	330

* 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.

Electrical characteristics

Unless otherwise indicated, specifications are measured at TA=25°C, humidity <75%, nominal input voltage and rated output load.

Parameter	Condition	Min.	Type	Max.	Unit	Note
Input current Full load	V_{IN}=3.3V V_{IN}=5V V_{IN}=12V V_{IN}=15V V_{IN}=24V	-	370 230 99 80 51	-	mA	
Input current No load		-	10	-	mA	
Reflected Ripple Current		-	15	-	mA	
Surge voltage 1 second max	V_{IN}=3.3V V_{IN}=5V V_{IN}=12V V_{IN}=15V V_{IN}=24V	-0.7 -0.7 -0.7 -0.7 -0.7	-	5 9 18 21 30	VDC	
Output voltage accuracy	All models	Refer to graphic in "Characteristic Curves" section				
Line regulation For V_{IN} change of ±1%	V_{OUT}=3.3V All others	-	-	±1.5 ±1.2	%	

Load regulation I_{OUT}=10% to 100% of $I_{OUT, rated}$	V_{OUT}=3.3V V_{OUT}=5V V_{OUT}=9V V_{OUT}=12V V_{OUT}=15V V_{OUT}=24V	-	15 10 9 8 7 6	20 15 10 10 10 10	%	
Temperature coefficiency	Full load	-	±0.02	-	%/°C	
Output ripple and noise	20MHz bandwidth	-	60	120	mVp-p	
Output short circuit protection		Continuous, automatic recovery				
Input filter		Capacitor				
Hot plug		None				

* 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.

General Specifications

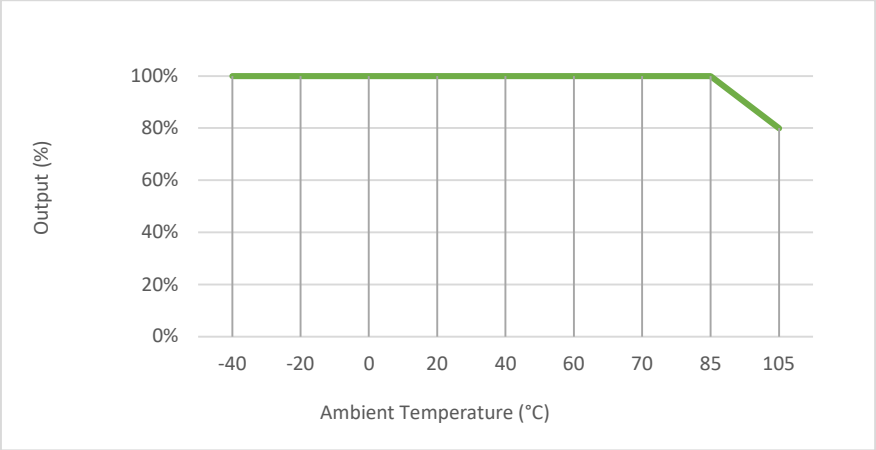
Parameters	Condition	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current <1mA	Input to Output	1500	-	-	VDC
Isolation resistance Tested at 500VDC	Input to Output	1000	-	-	M ohm
Isolation capacitance 100KHz, 0.1V	Input to Output	-	20	-	pF
Operating temperature	See “Derating Curve”	-40	-	+105	°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	-	220	-	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 with External Circuit IEC/EN61000-4-2, air ±8kV, contact ±6kV, Criteria B
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.

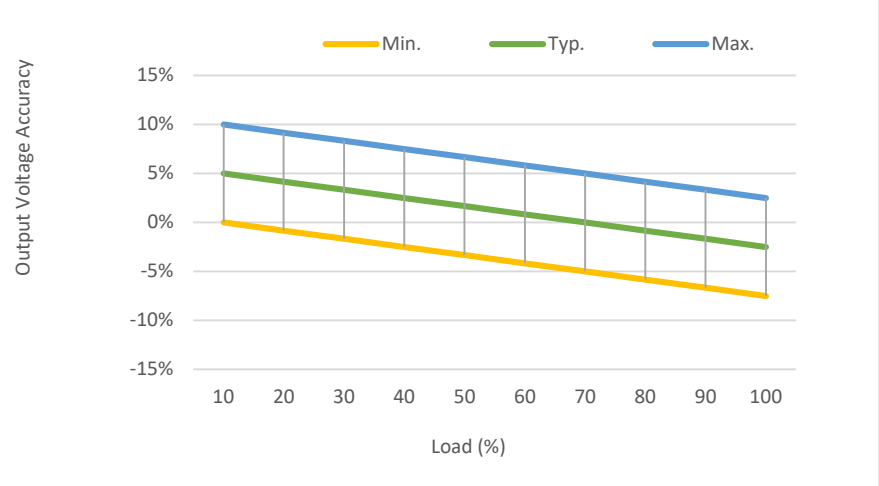
Characteristics Curves

Derating Curve

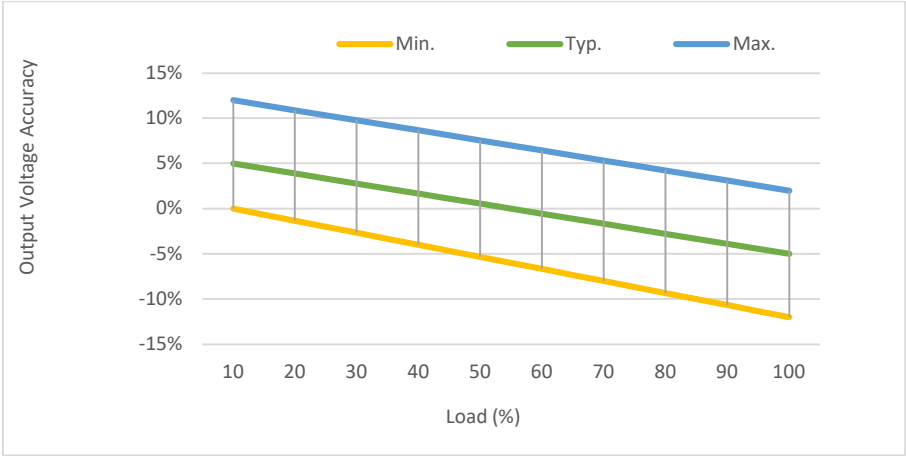
Output vs Ambient Temperature



Output Voltage Accurancy vs Load

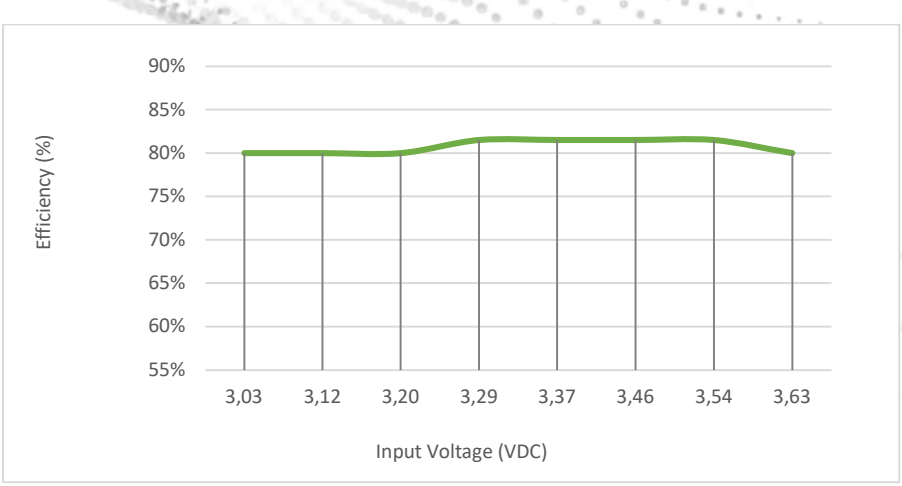


None 3.3V output models



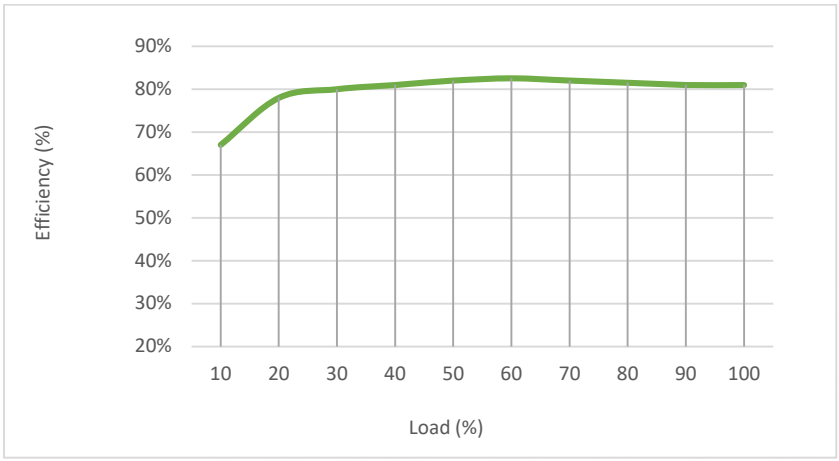
3.3V output models

Efficiency Curves
Efficiency vs Input Voltage



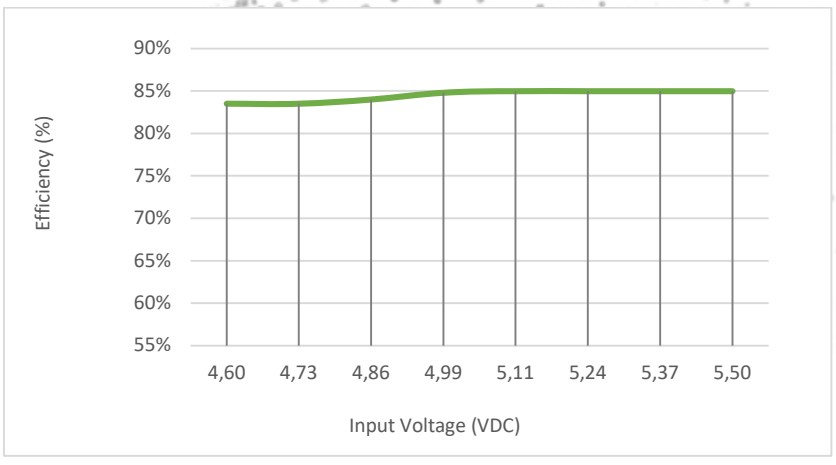
SDM01T, with full Load

Efficiency vs Load



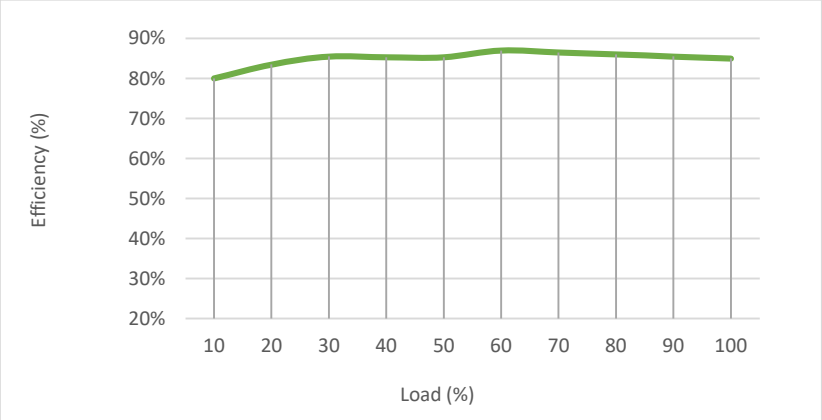
SDM01T, with nominal input voltage

Efficiency vs Input Voltage



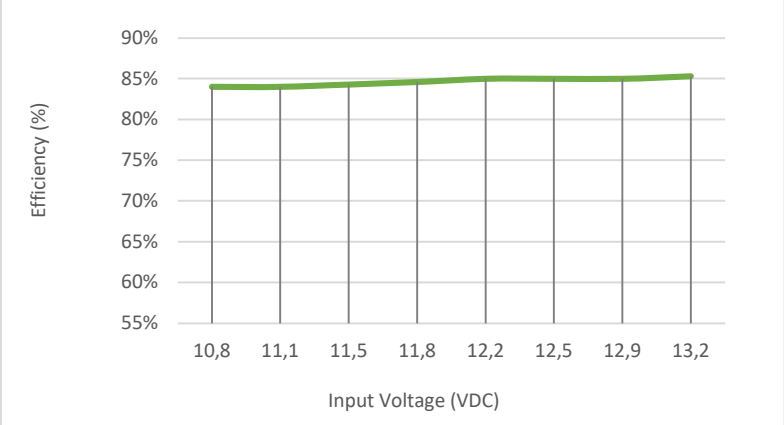
SDM01T, with full Load

Efficiency vs Load



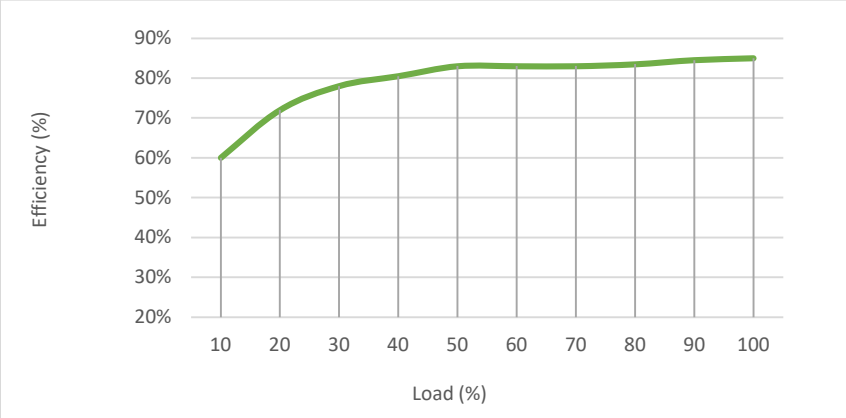
SDM01T, with nominal input voltage

Efficiency vs Input Voltage



SDM01T, with full Load

Efficiency vs Load



SDM01T, with nominal input voltage

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.

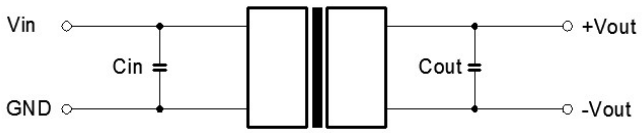


Figure 1: Typical External circuit

Recommended component spec

Input voltage	3.3, 5V	12V	15V	24V
C_{IN}	4.7uF, 16V	2.2uF, 25V	2.2uF, 25V	1uF, 50V

Recommended component spec

Output voltage	3.3, 5V	9V	12V	15V	24V
C_{OUT}	10uF, 16V	4.7uF, 16V	2.2uF, 25V	1uF, 25V	0.47uF, 50V

Circuit for EMC Enhancement

*Use this application circuit to meet Class B EMC performance.

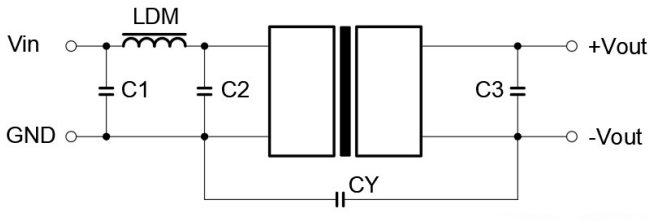


Figure 2: Circuit for EMC Enhancement

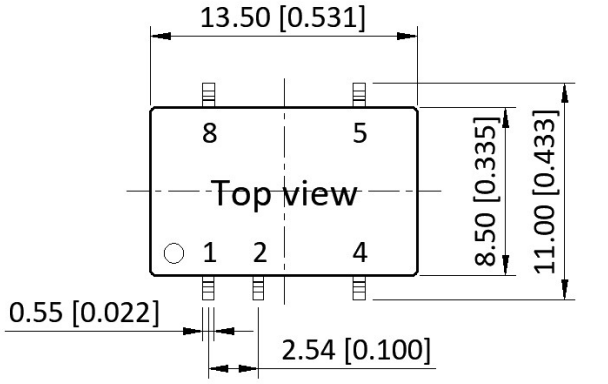
Recommended component spec

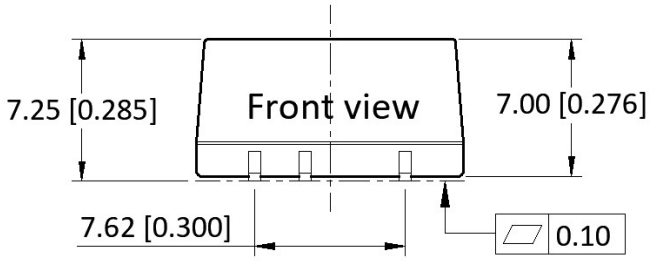
Component	LDM	C1, C2	CY	C3
C_{OUT}	6.8uH	4.7uF, 50V	270pF, 2KV	Refer to C_{OUT} in [Table 2]

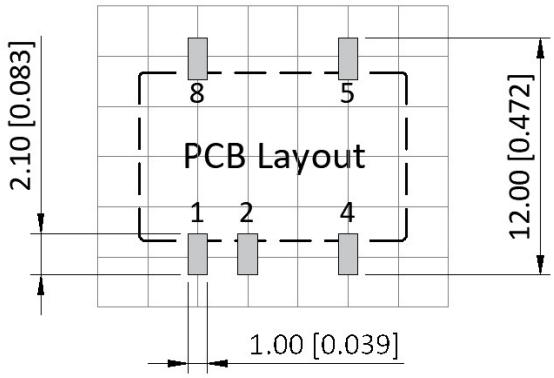
*__CY__ is omitted for $5V_{IN}$ models, with V_{OUT} = 3.3 … 9V

*__C3__ refer to C_{OUT} in

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

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.

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

Document revision

Rev	Date	Changes
2025v0.1	26-08-2025	First issue of document