

1W, DC/DC Power Converter

SDF01N

SUMMIT
ELECTRONICS



Introduction

The SDF01N series are DIP8 package DC/DC converters with unregulated single output, and 3KVDC isolation. These converters feature high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range. 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 $\pm 10\%$
- Unregulated single output
- High efficiency, up to 85%
- Small no load input current
- Isolation voltage 3KVDC
- Operating temperature range: $-40 \sim +105^{\circ}\text{C}$ ambient
- RoHS compliant
- Compact DIP8 package
- Continuous short circuit protection
- 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 (uF) Max.
SDF01N0303	3.3	3.3	303	30	75	2400
SDF01N0305	3.3	5	200	20	79	2400
SDF01N0503	5	3.3	303	30	74	2400
SDF01N0505	5	5	200	20	82	2400
SDF01N0509	5	9	111	12	83	1000
SDF01N0512	5	12	84	9	83	560
SDF01N0515	5	15	67	7	83	560
SDF01N0524	5	24	42	4	85	220
SDF01N0905	9	5	200	20	86	2400
SDF01N0909	9	9	111	12	87	1000
SDF01N0912	9	12	84	9	87	560
SDF01N0915	9	15	67	7	88	560
SDF01N0924	9	24	42	4	89	220
SDF01N1203	12	3.3	303	30	75	2400
SDF01N1205	12	5	200	20	80	2400
SDF01N1209	12	9	111	12	78	1200
SDF01N1212	12	12	83	9	80	560
SDF01N1215	12	15	67	7	81	560
SDF01N1505	15	5	200	20	80	2400
SDF01N1509	15	9	111	12	80	1200
SDF01N1515	15	15	67	7	81	560
SDF01N2403	24	3.3	303	30	75	2400
SDF01N2405	24	5	200	20	79	2400

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SDF01N2409	24	9	111	12	80	1200
SDF01N2412	24	12	83	9	81	560
SDF01N2415	24	15	67	7	81	560
SDF01N2424	24	24	42	5	81	220

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

* See SDF01N series for 1.5KVDC isolation models.

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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	$V_{IN}=3.3\text{V}$		406			
	$V_{IN}=5, 9\text{V}$		235			
	$V_{IN}=12\text{V}$	-	98	-	mA	
	$V_{IN}=15\text{V}$		79			
	$V_{IN}=24\text{V}$		50			
Input current No load	$V_{IN}=3.3\text{V}$		15	20		
	$V_{IN}=5\text{V}$	-	5	11	mA	
	$V_{IN}=9 \dots 15\text{V}$		3	7		
	$V_{IN}=24\text{V}$		2	5		
Reflected Ripple Current		-	30	-	mA	
Surge voltage 1 second max	$V_{IN}=3.3, 5\text{V}$	-0.7		9		
	$V_{IN}=9\text{V}$	-0.7	-	12	VDC	
	$V_{IN}=12, 15\text{V}$	-0.7		20		
	$V_{IN}=24\text{V}$	-0.7		30		
Output voltage accuracy	All models	Refer to graphic in "Characteristic Curves" section				
Line regulation For V_{IN} change of $\pm 1\%$	$V_{OUT}=3.3\text{V}$	-	-	± 1.5	%	
	All others			± 1.2		
Load regulation $I_{OUT}=10\%$ to 100% of $I_{OUT, rated}$	$V_{OUT}=3.3\text{V}$		8	20		
	$V_{OUT}=5\text{V}$	-	5	15	%	
	Others		3	10		
Temperature coefficient	Full load	-	± 0.02	-	$\%/^{\circ}\text{C}$	
Output ripple and noise		-	30	75	mVp-p	

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20MHz bandwidth						
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.

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit	Notes
Isolation voltage 1 minute, leakage current <1mA	I/P to O/P	3000	-	-	VDC	
Isolation resistance Tested at 500VDC	I/P to O/P	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	I/P to O/P	-	20	-	pF	
Operating temperature	See "Derating Curve"	-40	-	+105	°C	
Storage temperature		-55	-	+125	°C	
Temperature rise at case Full load	V _{OUT} =3.3V All others	-	25 15	-	°C	
Storage humidity	Non-condensing	5	-	95	%RH	
Switching frequency Full load		-	450	-	KHz	
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	300	°C	
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z				
Case material		Black plastic UL94-V0				
Cooling method		Free air convection				
Design based on standards		UL/EN/IEC 62368-1				

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Safety certifications		EN/IEC 62368-1
EMC	Emissions Immunity	CISPR32, EN55032 Class B* IEC/EN61000-4-2
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T _A =25°C
Size		12.9 x 10.7 x 8.2 mm
Weight		1.8g Typ.

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

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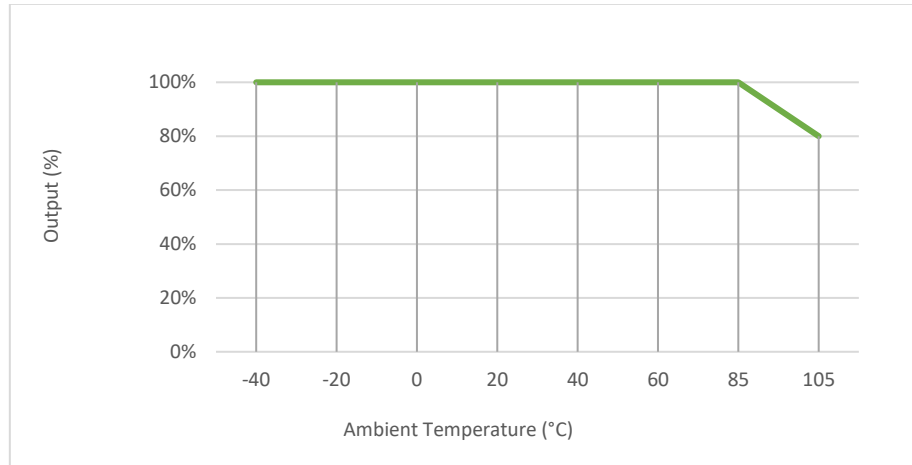
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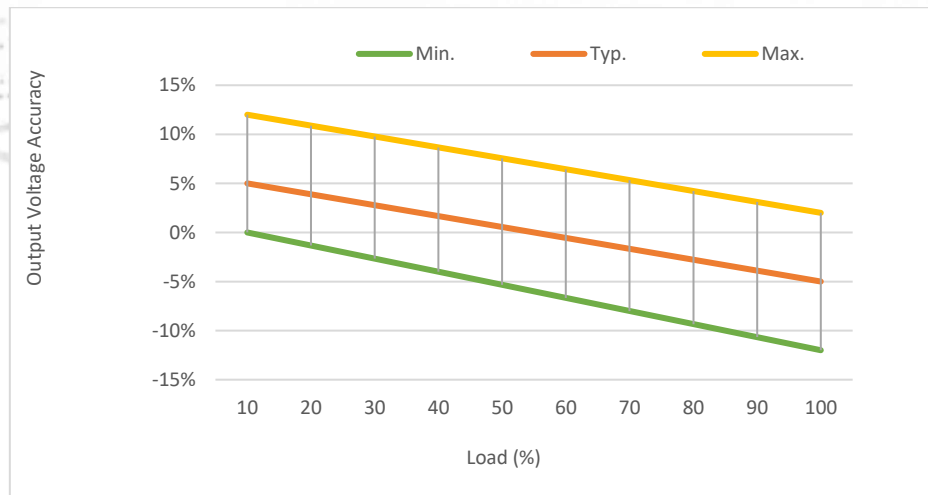
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



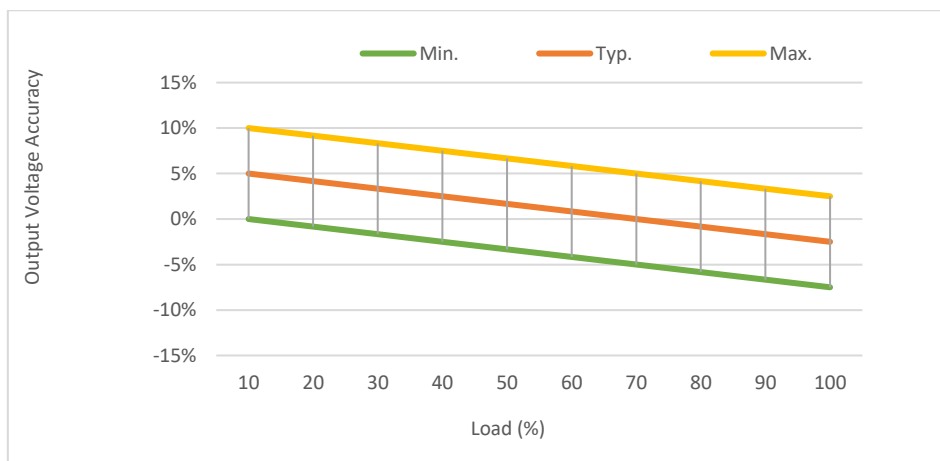
Output Voltage Accuracy vs Load



$V_{out}=3.3V$

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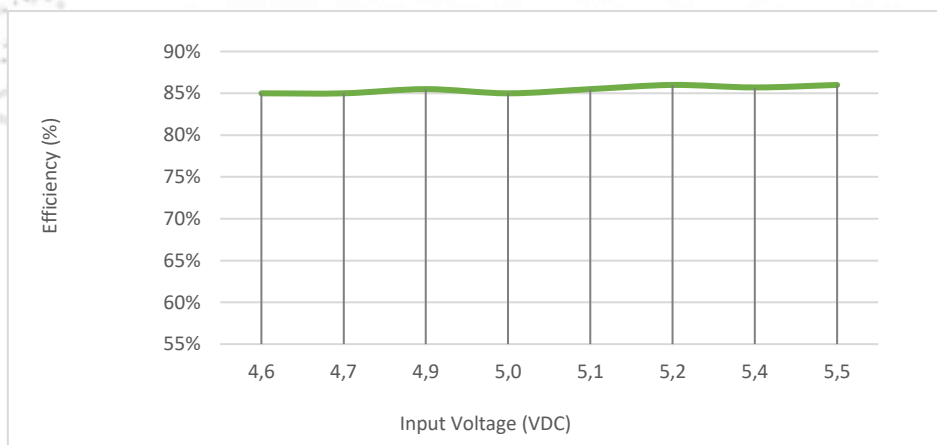
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None 3.3V output models

Efficiency Curves

Efficiency vs Input Voltage



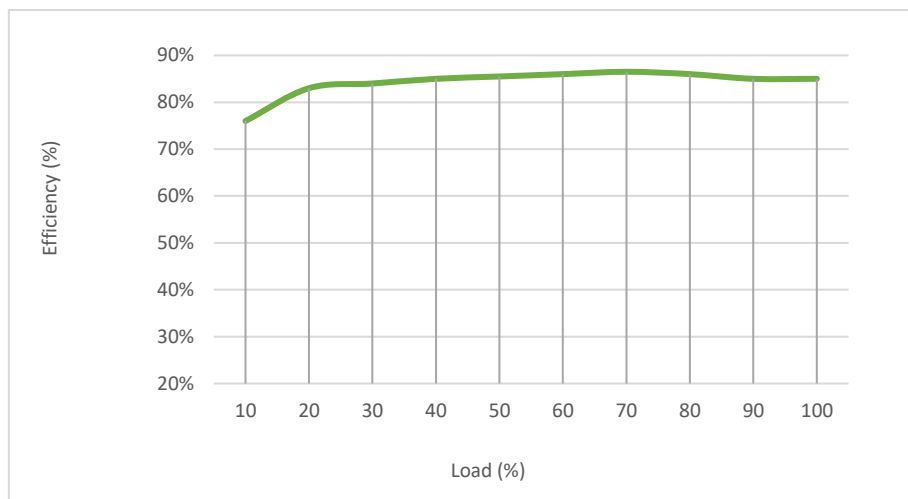
SDF01N, with full Load

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Efficiency vs Input Voltage



SDF01N, 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.

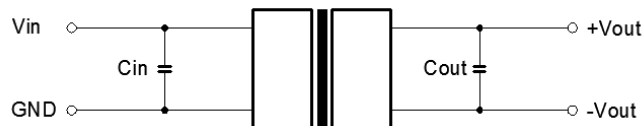


Figure 1: Typical External circuit

Recommended component spec

Input voltage	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	15, 24V
C _{OUT}	10uF, 16V	4.7uF, 25V	2.2uF, 25V	1uF, 50V

Circuit for EMC Enhancement

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

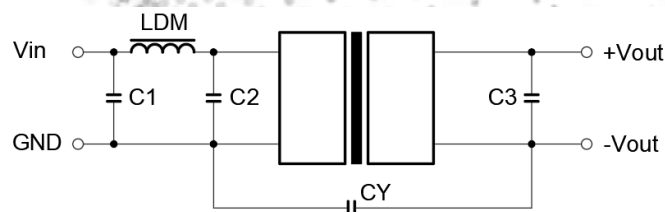


Figure 2: Circuit for EMC Enhancement

Recommended component spec

Item	LDM	C1, C2	CY
Spec	6.8uH	4.7uF, 50V	270pF, 4KV

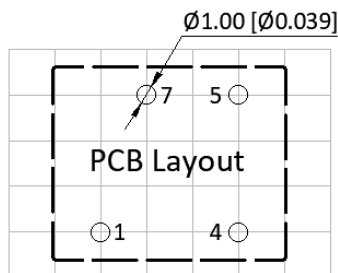
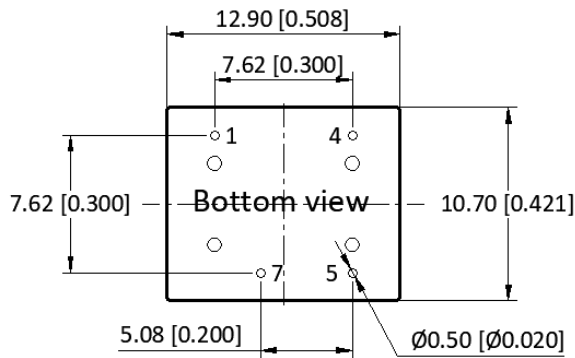
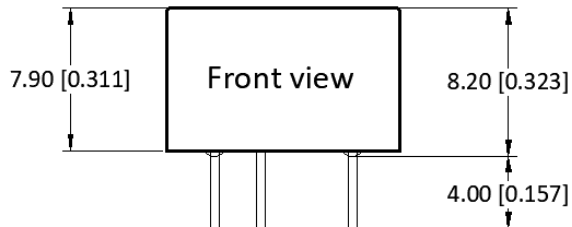
*C3 refer to C_{OUT} in [Table 2]

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Mechanical Specifications



Pin Definition

Pin #	Single Out	
1	GND	
4	V _{IN}	
5	+V _{OUT}	
7	0V	

* Unless otherwise specified unit:

mm [inch]

* General tolerance: ± 0.25 [± 0.010]

* 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