

2W, DC/DC Power Converter

SDF02D

SUMMIT
ELECTRONICS



Introduction

The SDF02D series are DIP14 package DC/DC converters with unregulated single or dual 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: 2W Max
- Input voltage range $\pm 10\%$
- Unregulated output
- High efficiency, up to 90%
- Small no load input current
- Isolation voltage 3KVDC
- Operating temperature range: $-40 \sim +105^{\circ}\text{C}$ ambient
- RoHS compliant
- Standard DIP14 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 (uF) Max.
SDF02D0303	3.3	3.3	400	40	82	2400
SDF02D0305	3.3	5	400	40	83	2400
SDF02D0309	3.3	9	222	22	84	1000
SDF02D0312	3.3	12	167	17	85	820
SDF02D0503	5	3.3	400	40	83	2400
SDF02D0505	5	5	400	40	85	2400
SDF02D0509	5	9	222	22	85	1000
SDF02D0512	5	12	167	17	86	820
SDF02D0515	5	15	133	13	87	680
SDF02D0524	5	24	83	8	88	560
SDF02D0503D	5	± 3.3	± 303	± 30	83	1000
SDF02D0505D	5	± 5	± 200	± 20	85	1000
SDF02D0509D	5	± 9	± 111	± 11	85	560
SDF02D0512D	5	± 12	± 83	± 8	86	560
SDF02D0515D	5	± 15	± 67	± 7	87	220
SDF02D0524D	5	± 24	± 42	± 4	87	100
SDF02D1203	12	3.3	400	40	84	2400
SDF02D1205	12	5	400	40	85	2400
SDF02D1209	12	9	222	22	86	1000
SDF02D1212	12	12	167	17	87	820
SDF02D1215	12	15	133	13	88	680
SDF02D1224	12	24	83	8	89	560
SDF02D1203D	12	± 3.3	± 303	± 30	84	1000

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SDF02D1205D	12	±5	±200	±20	85	1000
SDF02D1209D	12	±9	±111	±11	86	560
SDF02D1212D	12	±12	±83	±8	87	560
SDF02D1215D	12	±15	±67	±7	88	220
SDF02D1224D	12	±24	±42	±4	86	100
SDF02D1503	15	3.3	400	40	84	2400
SDF02D1505	15	5	400	40	85	2400
SDF02D1509	15	9	222	22	86	1000
SDF02D1512	15	12	167	17	87	820
SDF02D1515	15	15	133	13	88	680
SDF02D15224	15	24	83	8	89	560
SDF02D1505D	15	±5	±200	±20	85	1000
SDF02D1509D	15	±9	±111	±11	86	560
SDF02D1512D	15	±12	±83	±8	87	560
SDF02D1515D	15	±15	±67	±7	88	220
SDF02D2403	24	3.3	400	40	84	2400
SDF02D2405	24	5	400	40	86	2400
SDF02D2409	24	9	222	22	87	1000
SDF02D2412	24	12	167	17	88	820
SDF02D2415	24	15	133	13	89	680
SDF02D2424	24	24	83	8	90	560
SDF02D2403D	24	±3.3	±303	±30	84	1000
SDF02D2405D	24	±5	±200	±20	86	1000
SDF02D2409D	24	±9	±111	±11	87	560
SDF02D2412D	24	±12	±83	±8	88	560
SDF02D2415D	24	±15	±67	±7	89	220
SDF02D2424D	24	±24	±42	±4	86	100

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

* For dual output models, max capacitive load stipulated in the above list is for each output

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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	$V_{IN}=3.3\text{V}$	-	768	-	mA	
	$V_{IN}=5\text{V}$		506			
	$V_{IN}=12\text{V}$		208			
	$V_{IN}=15\text{V}$		167			
	$V_{IN}=24\text{V}$		104			
Input current		-	4	15	mA	
Reflected Ripple Current		-	15	-	mA	
Surge voltage 1 second max	$V_{IN}=3.3\text{V}$	-0.7	-	5	VDC	
	$V_{IN}=5\text{V}$	-0.7		9		
	$V_{IN}=12\text{V}$	-0.7		18		
	$V_{IN}=15\text{V}$	-0.7		21		
	$V_{IN}=24\text{V}$	-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	$V_{OUT}=3.3, 5\text{V}$	-	14 10	20 15	%	
	Others					
Temperature coefficient	Full load	-	-	± 0.03	$\%/^{\circ}\text{C}$	
Output ripple and noise	20MHz bandwidth	-	60	150	mVp-p	
Output short circuit protection		Continuous, automatic recovery				
Input filter		Capacitor				

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Hot plug		None
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* 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.

* Dual output models need to operate with balanced load. The load difference between two outputs over 10% may cause unstable operating of the converter.

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current <1mA	Input to Output	3000	-	-	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	-	-	95	%RH
Switching frequency	Full load	-	220	-	KHz
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	300	°C
Case material		Black plastic UL94-V0			
Cooling method		Free air convection			
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z			
Design based on standards		UL/EN/IEC 62368-1			
Safety certifications		EN/IEC 62368-1			
EMC	Emissions	CISPR32, EN55032 Class B with External Circuit			

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	Immunity	IEC/EN61000-4-2, Air ±8KV, Contact ±6KV, Criteria B
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T _A =25°C
Size		19.5 x 9.8 x 8.0 mm
Weight		2.4g Typ.

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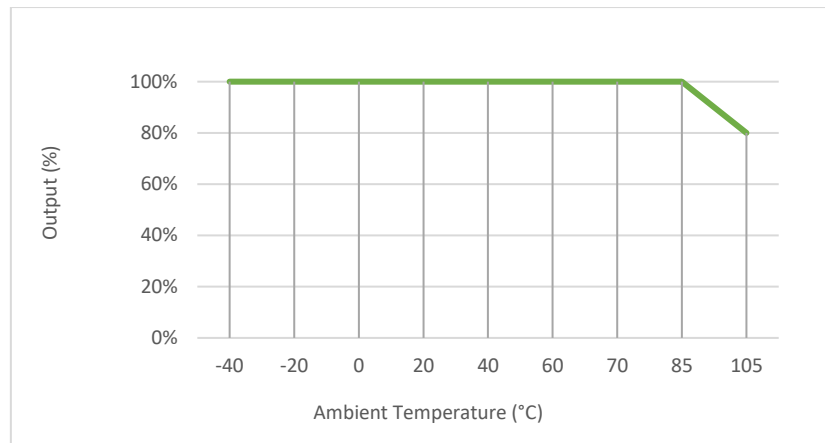
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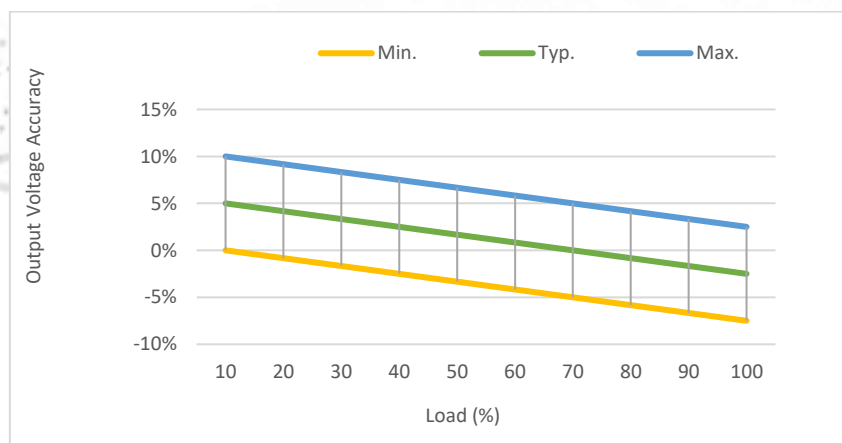
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



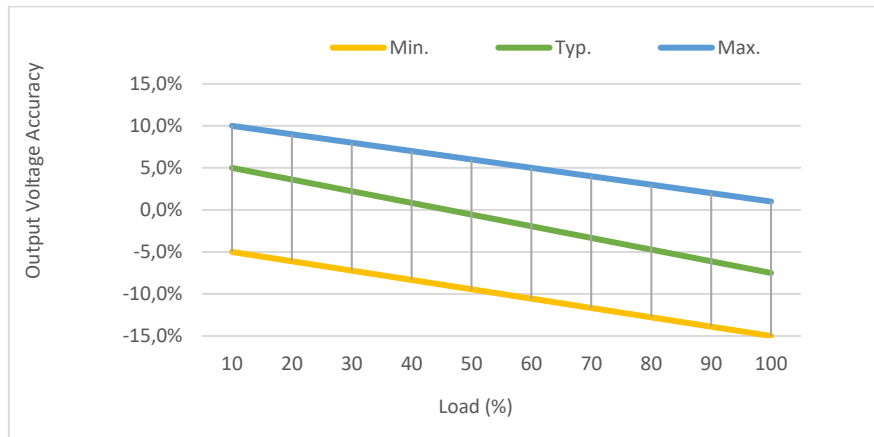
Output Voltage Accuracy vs Load



None 3.3V output models

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3.3V output models

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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.

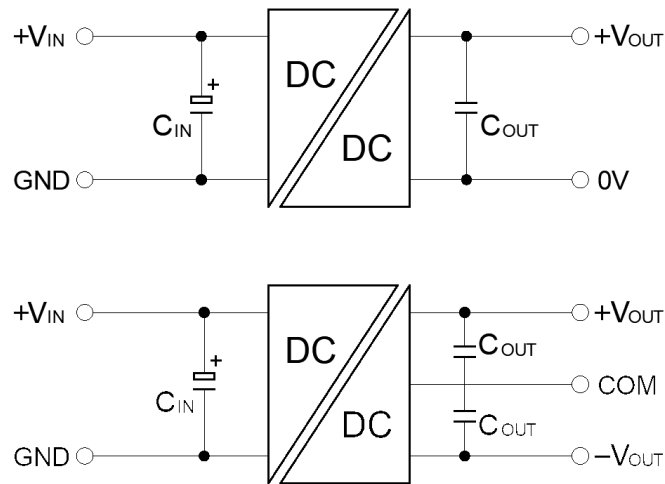


Figure 1: Typical External circuit

Recommended components

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

Recommended component spec

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

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EMC Enhancement for EN55032 Class B

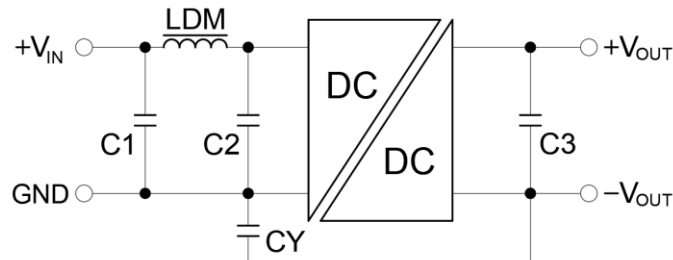


Figure 2: Circuit for EMC Enhancement

Recommended components

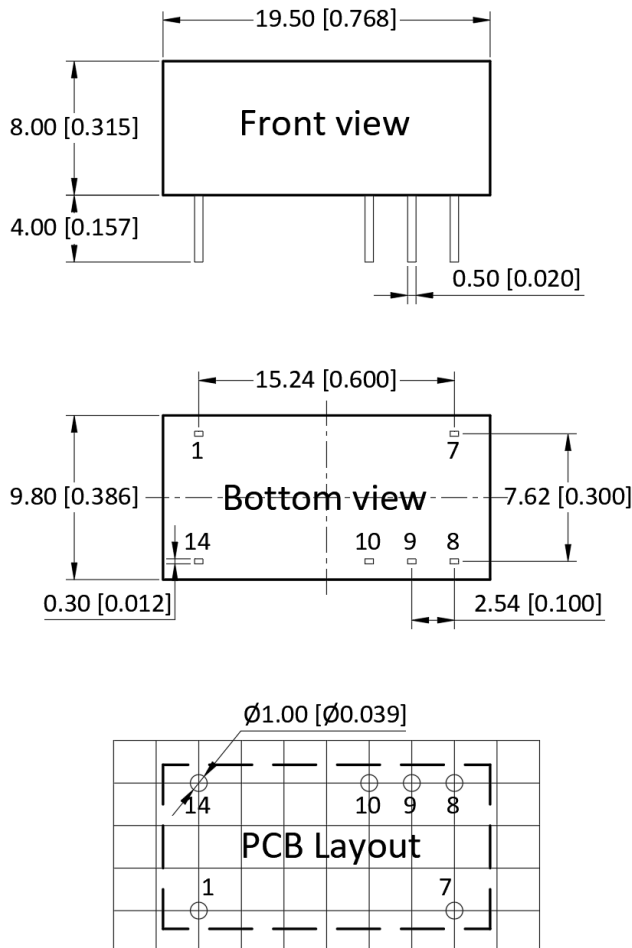
Item	Spec
LDM	6.8uH
C1, C2	4.7uF, 50V
CY	1nF, 4KV
C3	Refer to C_{OUT} in [Table 1]

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Mechanical Specifications



Pin Definition

Pin #	Single Out	Dual Out
1	GND	GND
7	NC	NC
8	+V _{OUT}	+V _{OUT}
9	No Pin	COM
10	0V	-V _O
14	V _{IN}	V _{IN}

* 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