

3W, DC/DC Power Converter

SDF03S

SUMMIT
ELECTRONICS



Introduction

The SDF03S series are unregulated SIP7 package DC/DC converters with single outputs, 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: 3W 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: $-40 \sim +85^{\circ}\text{C}$ ambient
- RoHS compliant
- Compact SIP7 package
- Continuous short circuit protection
- Designed to meet 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.
SDF03S0503	5	3.3	600	60	80	220
SDF03S0305	5	5	600	60	83	220
SDF03S0309	5	9	333	33	83	220
SDF03S1205	12	5	600	60	83	220
SDF03S1212	12	12	250	25	83	220
SDF03S1515	15	15	200	20	85	220

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

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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	$V_{IN}=5\text{V}$		714			
	$V_{IN}=12\text{V}$	-	284	-	mA	
	$V_{IN}=15\text{V}$		230			
Input current No load	$V_{IN}=5\text{V}$		10			
	$V_{IN}=12\text{V}$	-	15	-	mA	
	$V_{IN}=15\text{V}$		20			
Reflected Ripple Current		-	15	-	mA	
Surge voltage 1 second max	$V_{IN}=5\text{V}$	-0.7		9		
	$V_{IN}=12\text{V}$	-0.7	-	18	VDC	
	$V_{IN}=15\text{V}$	-0.7		21		
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	%	
	Others			± 1.2		
Load regulation $I_{OUT}=10\%$ to 100% of $I_{OUT, rated}$	$V_{OUT}=3.3\text{V}$	-	14	20	%	
	Others		10	15		
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				
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.

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current 1mA max	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	-	+85	°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
Cooling method		Free air convection			
Case material		Black plastic UL94-V0			
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 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			

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Size		19.65 x 7.05 x 10.10 mm
Weight		2.4g Typ.

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

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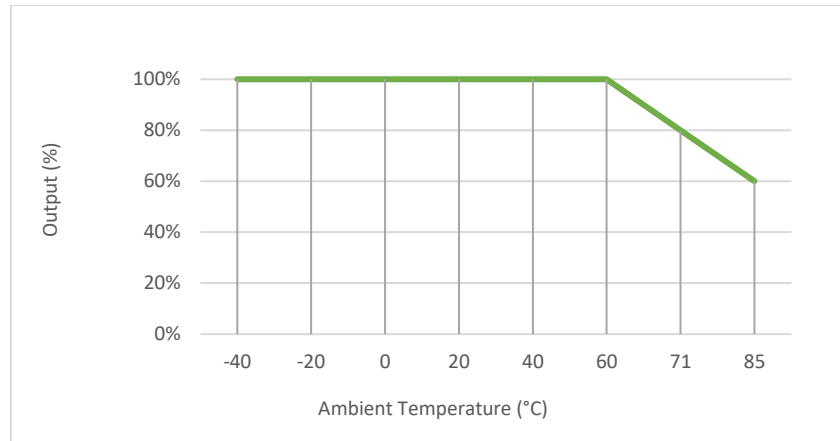
SDF03S



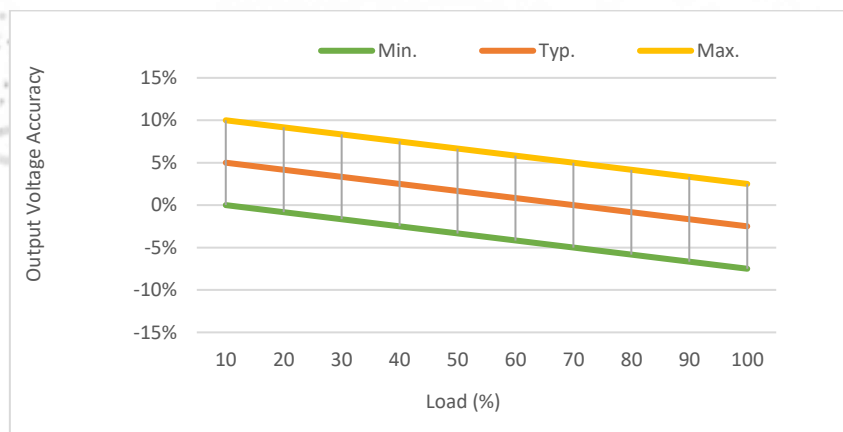
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



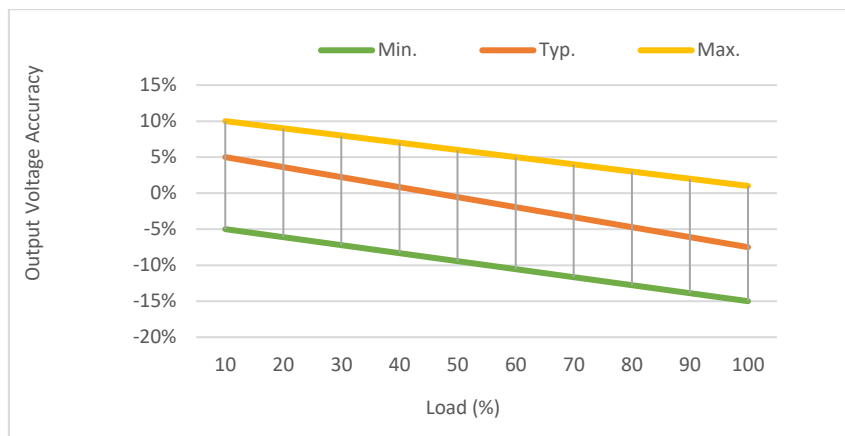
Output Voltage Accuracy vs Load



None 3.3V output models

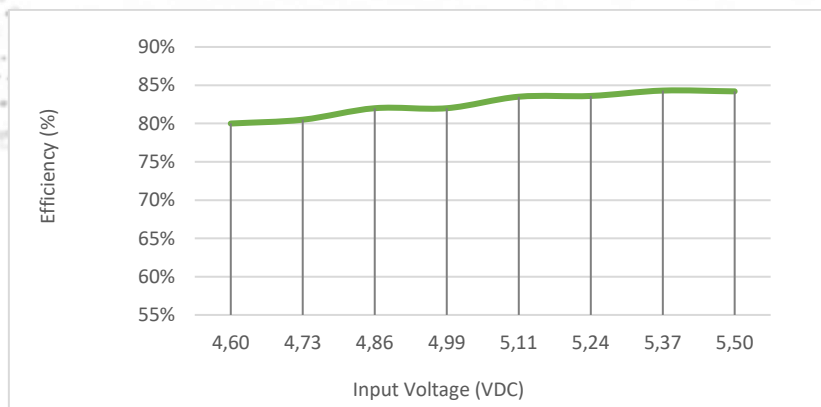
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3.3V output models

Efficiency vs Input Voltage



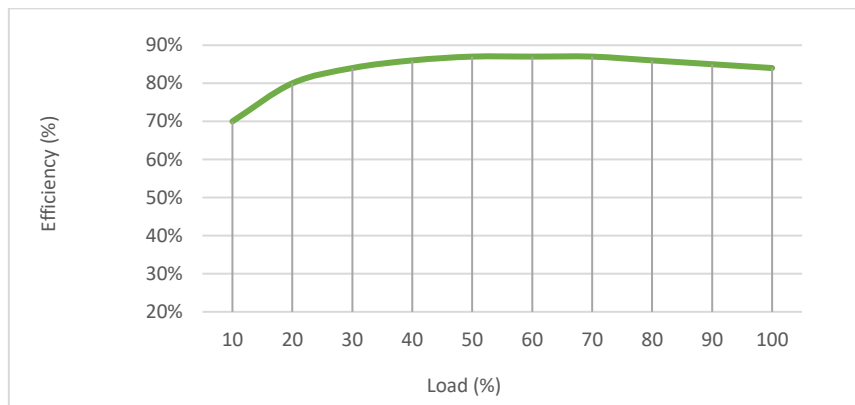
SDF03S, with full Load

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Efficiency vs Load



SDF03S, 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.

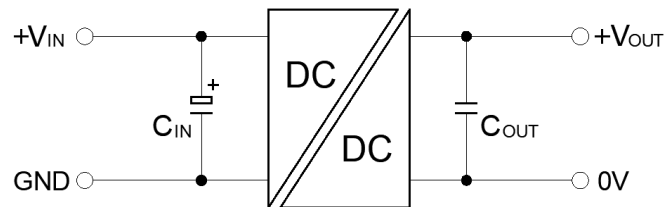


Figure 1: Typical External circuit

Recommended components

Input voltage	C _{IN}		Output voltage	C _{OUT}
5V	4.7uF, 16V		3.3, 5V	10uF, 16V
12, 15V	2.2uF, 25V		9, 12V	2.2uF, 25V
			15V	1uF, 25V

Recommended component spec

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

EMC Enhancement for EN55032 Class B

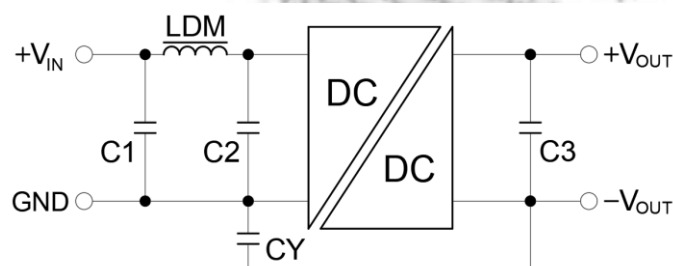


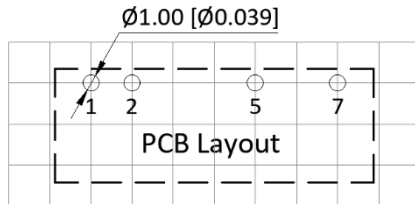
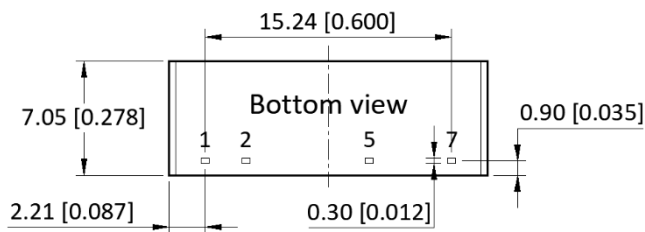
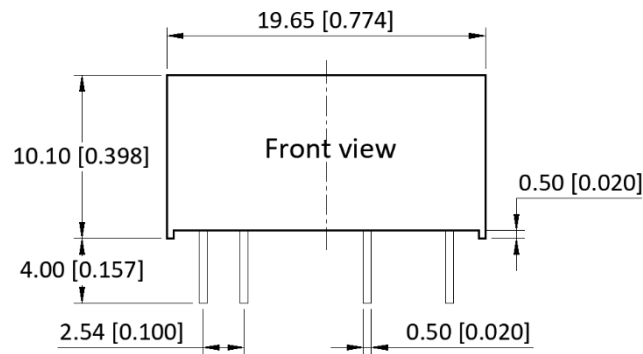
Figure 2: Circuit for EMC Enhancement

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Mechanical Specifications



Pin Definition

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

* 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