

0.5A, DC/DC Power Converter

SDX05S

SUMMIT
ELECTRONICS



Introduction

The SDX05S series are 0.5A rated non-isolated switching regulators, pin to pin compatible with LM78 family linear regulators. Unlike those linear regulators, the switching regulators are high efficiency. They do not need for any heatsinks because very little energy is wasted as heat. Besides, these converters accept ultra-wide input range, operate over wide ambient temperature range, and are continuous short circuit protected. These converters are especially suitable for applications where energy saving, space saving and high performance are essential.

Features

- Rated current: 0.5A Max
- Non-isolated, step-down switching regulator
- Input range: 4.75~36VDC
- Regulated single output
- High efficiency up to 95%
- Low ripple and noise
- No load input current only 0.2mA typ.
- Operating temperature range: -40 ~ +85°C ambient
- RoHS compliant
- Compact SIP3 package
- Compatible with LM78 linear regulators
- 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 Range [VDC]			V _{OUT} [VDC]	I _{OUT} [mA] Max.	Efficiency [%] Typ.		Capacitive Load [uF] Max.
	Nom.	Min.	Max.			Min. V _{IN}	Max. V _{IN}	
SDX05S033	24	4.75	36	3.3	500	86	80	680
SDX05S050	24	6.5	36	5	500	90	84	680
	12	7	31	-5	-300	80	80	330
SDX05S090	24	12	36	9	500	93	90	680
SDX05S120	24	15	36	12	500	94	91	680
	12	8	24	-12	-150	85	84	330
SDX05S150	24	19	36	15	500	95	93	680
	12	8	21	-15	-150	87	85	330

* Only typical models are listed. Contact our sales agent for availability of other 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	Notes
No load input current	V_{IN} = Min. to Max.	-	0.2	1.5	mA	
Output voltage accuracy Full load	$V_{OUT}=3.3\text{V}$ Others	-	± 2 ± 2	± 4 ± 3	%	
Line regulation	V_{IN} = Min. to Max.	-	± 0.2	± 0.4	%	
Load regulation $I_{OUT} = 10\% \sim 100\%$	$V_{OUT}=3.3, 5\text{V}$ Others	-	± 0.6 ± 0.3	-	%	
Temperature coefficient	$40^{\circ}\text{C} \sim +85^{\circ}\text{C}$	-	-	± 0.03	%/ $^{\circ}\text{C}$	
Output ripple and noise $I_{OUT} = 10\% \sim 100\%$	20MHz bandwidth	-	20	75	mVp-p	
Dynamic load response $I_{OUT}=25\% \sim 50\% \sim 75\%$ of $I_{OUT, rated}$	Peak deviation Recovery time	-	50 0.2	250 1	mV mS	
Output short circuit protection		Continuous, automatic recovery				
Reversed input		NOT protected				
Input filter		Capacitor				

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit
Operating temperature	See "Derating Curve"	-40	-	+85	°C
Storage temperature		-55	-	+125	°C
Storage humidity	Non-condensing	5	-	95	%RH
Switching frequency	Full load	550	-	850	KHz
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	260	°C
Case material		Black plastic UL94-V0			
Design based on standards		UL/EN/IEC 62368-1			
Safety certifications		EN/IEC 62368-1			
EMC	Emissions Immunity	CISPR32, EN55032 Class B* (external circuit required) IEC/EN61000-4-2, 3, 4, 6			
MTBF	MIL-HDBK-217F	>2,000,000 Hours, T _A =25°C			
Size & Weight		11.60 x 7.55 x 10.16 mm, 1.8g Typ.			

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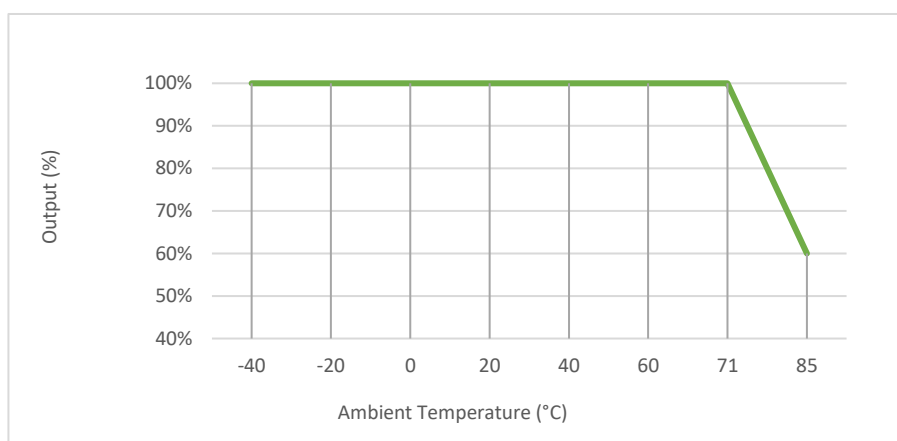
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Characteristics Curves

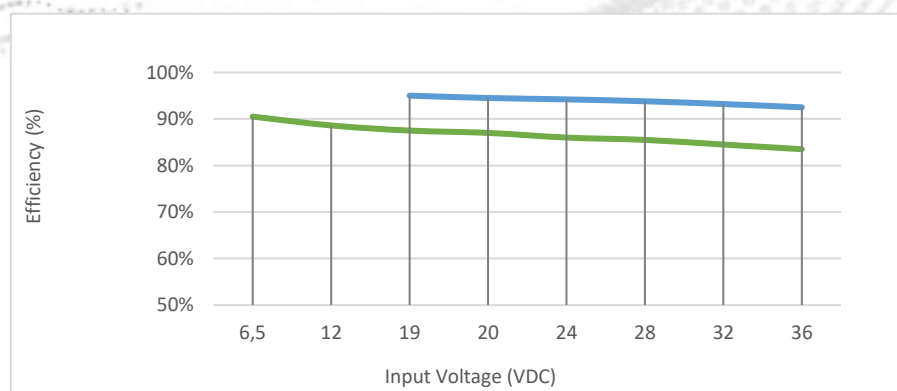
Derating Curve

Output vs Ambient Temperature



Efficiency vs Input Voltage

Full Load



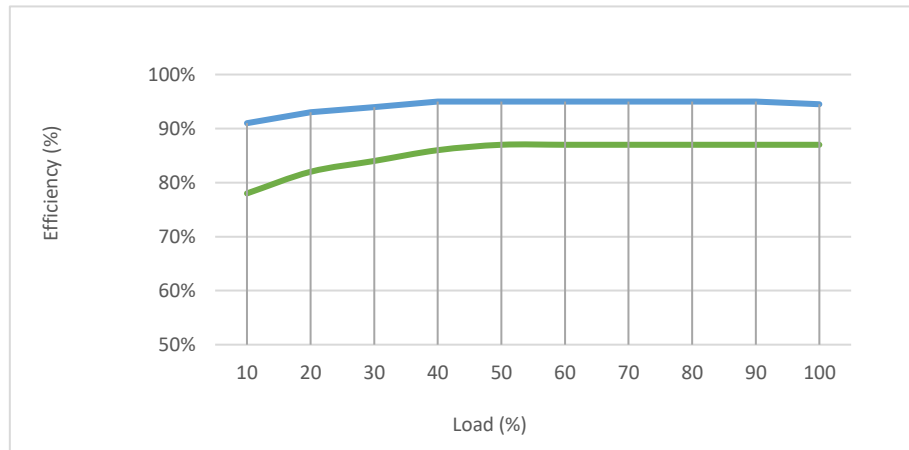
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Efficiency vs Load

Nominal input voltage



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Recommended External Circuit

Typical Application Circuit

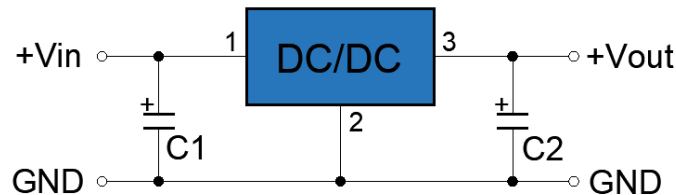


Figure 1: positive output application

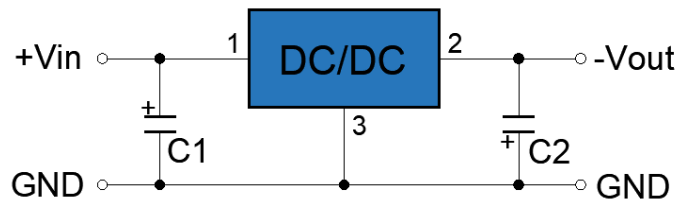


Figure 2: negative output application

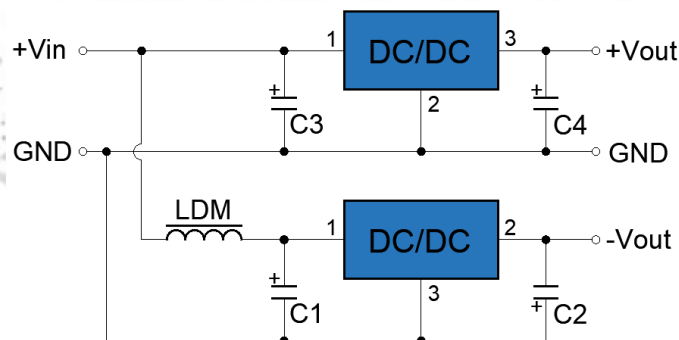


Figure 3: dual output application

Notes:

1. C1, C2, C3, C4 are ceramic capacitors, and mandatory for operating of the converters. They can also be tantalum or low ESR electrolytic capacitors. Recommended specs listed in the table on right can be changed according to the needs in the circuits. Recommended LDM is 10uH.
2. The converter can be used both for positive and negative output using the circuit connection shown above.
3. These converters are not allowed to use in parallel or hot plug without support from properly designed external circuits.

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Recommend component specifications

Model Number	C1, C3	C2, C4
SDX05S033	10uF, 50V	22uF, 10V
SDX05S050	10uF, 50V	22uF, 10V
SDX05S090	10uF, 50V	22uF, 16V
SDX05S120	10uF, 50V	22uF, 25V
SDX05S150	10uF, 50V	22uF, 25V

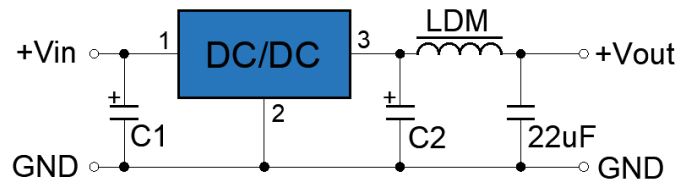
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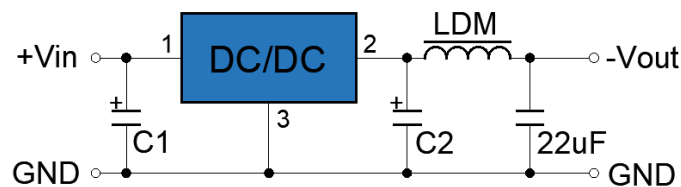
Recommended External Circuit (continued)

Output Filtering Circuit

* Connect "LC" filtering circuit as below can further reduce the output ripple. Recommended value for "L" is 10uH~47uH.



Positive output



Negative output

Figure 4, recommended output filtering circuit

Circuit for EMC Enhancement

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

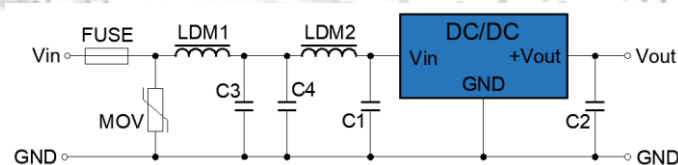


Figure 5: Circuit for EMC Enhancement

Recommended component spec

Component	MOV	LDM1	LDM2	C3	C4
Spec	20D470K	82uH	12uH	680uH, 50V	4.7uF, 50V

*C1 & C2 Refer to the same in [Table 1]

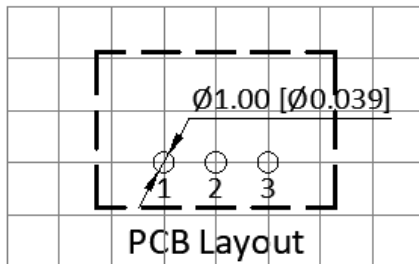
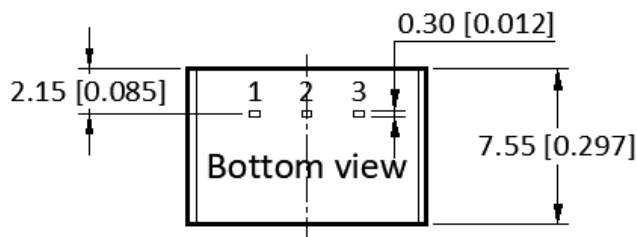
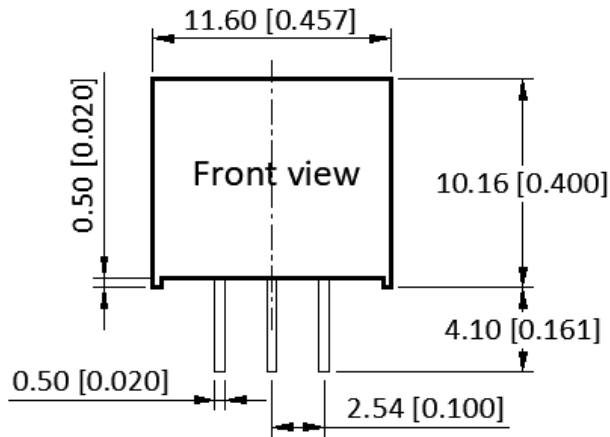
*Recommended component values are for reference only. They can be changed according to design needs.

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Mechanical Specifications



Pin Definition

Pin #	Positive Out	Negative Out
1	+V _{IN}	+V _{IN}
2	GND	-V _{OUT}
3	+V _{OUT}	GND

* Unless otherwise specified unit: mm [inch]

* General tolerance: ± 0.50 [± 0.020]

* Pin thickness tolerance: ± 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