

0.5A, DC/DC Power Converter

SDX05SU

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Introduction

The SDX05SU series are non-isolated switching regulators, pin to pin compatible with LM78 family linear regulators. Unlike those linear regulators, the RM series switching regulators are high efficiency up to 95%. They do not need for any heatsink because very little energy is wasted as heat. Besides, these converters accept very wide input voltage range 9~90VDC, operate over wide ambient temperature range -40 ~ +85°C, and are short circuit and overheat protected. These converters are especially suitable for applications such portable devices, where energy saving, space saving and high performance are essential.

Features

- Rated current: 0.5A Max
- Non-isolated, step-down switching regulators
- Input range: 9~90VDC
- Regulated single output with low ripple and noise
- High efficiency up to 95%
- 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/IEC/EN 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}	
SDX05SU033	48	9	90	3.3	500	82	75	100
SDX05SU050	48	9	90	5	500	87	81	100
SDX05SU065	48	9	90	6.5	500	91	84	100
SDX05SU090	48	14	90	9	500	92	86	100
SDX05SU120	48	18	90	12	500	93	89	100
SDX05SU150	48	20	90	15	500	94	90	100
SDX05SU240	48	36	90	24	300	95	91	100

* Only typical models are listed. Contact our sales agent for availability of other models.

* Add suffix "L" for pins bended to L shape. See Mechanical Specifications for details. E.g. RM05SU-050L, RM05SU-150L.

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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	RM05SU-033	-	± 3	± 4	%	
Full load	Other models		± 2	± 3		
Line regulation	V_{IN} = Min. to Max.	-	± 0.6	± 1	%	
Load regulation		-	± 0.5	± 1	%	
$I_{OUT} = 10\% \sim 100\%$						
Temperature coefficient	- $40^{\circ}\text{C} \sim +85^{\circ}\text{C}$	-	-	± 0.03	%/ $^{\circ}\text{C}$	
Output ripple and noise	20MHz bandwidth	-	40	80	mVp-p	
Dynamic load response	Peak deviation	-	± 0.4	± 1.5	V_{OUT} %	
$I_{OUT}=25\% \sim 50\% \sim 75\%$ of $I_{OUT, rated}$	Recovery time		1	1.5	mS	
Minimum load required		10	-	-	%	
Output short circuit protection		Continuous, automatic recovery				
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
Maximum case temperature		-	65	100	°C
Switching frequency	Full load	120	-	800	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			
Design based on standards		UL/EN/IEC 62368-1			
Safety certifications		EN 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	Default package Suffix "L" package	11.5 x 9.0 x 17.5 mm 19.0 x 11.5 x 9.0 mm			

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Weight		4g Typ.
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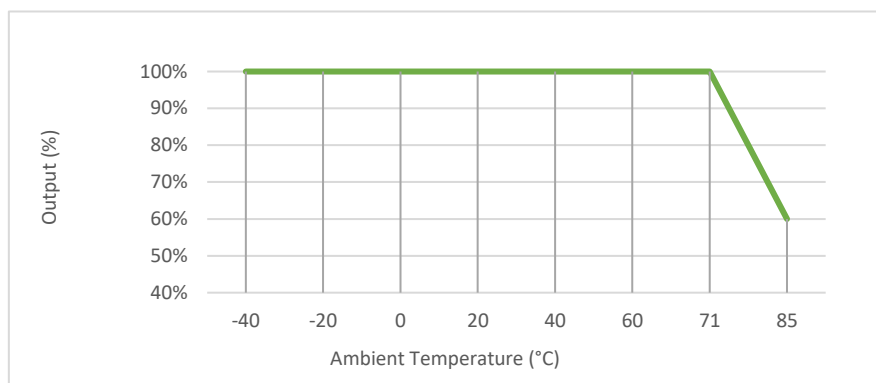
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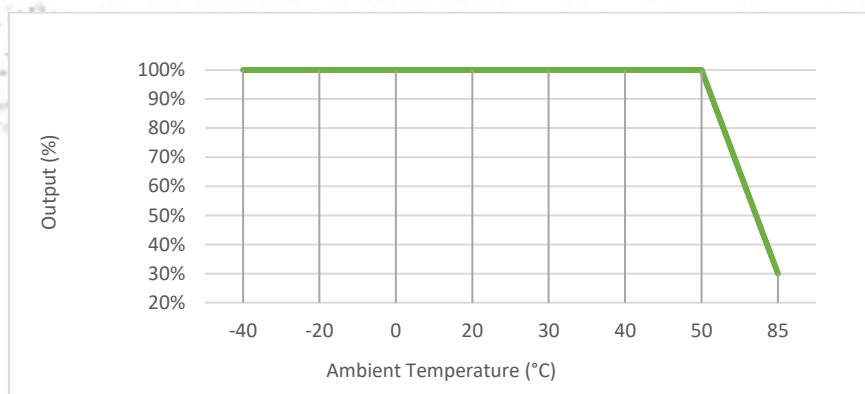
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



$V_{IN} < 60VDC$



$V_{IN} = 60 \sim 90VDC$

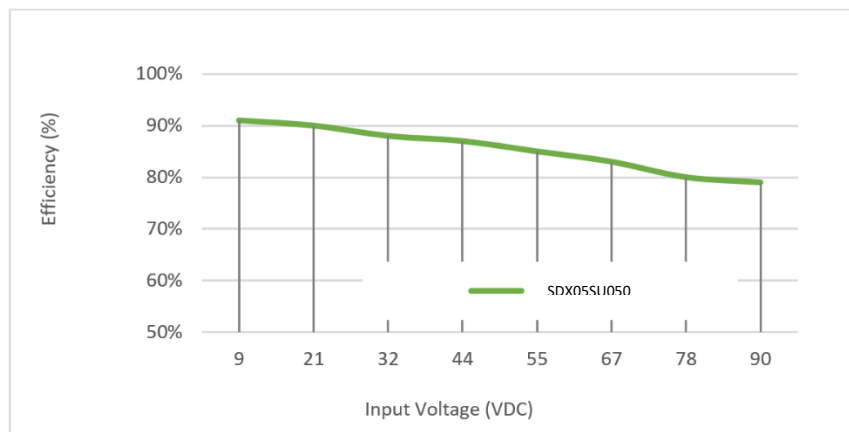
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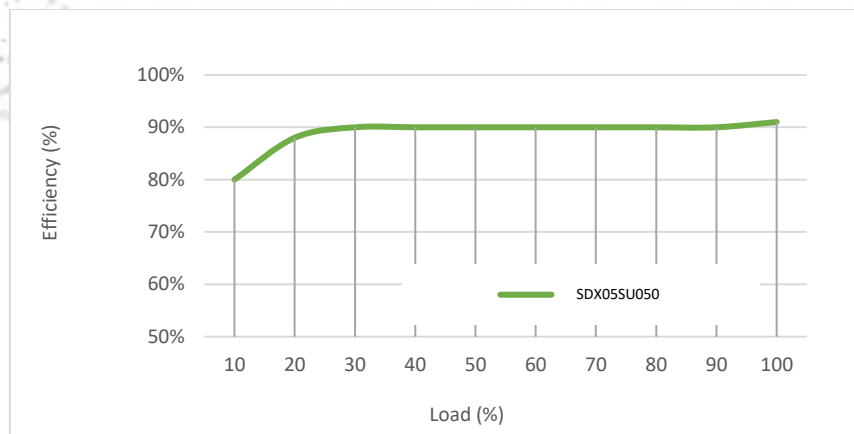
Efficiency vs Input Voltage

Full Load



Efficiency vs Load

Nominal input voltage



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Recommended External Circuit

Typical Application Circuit

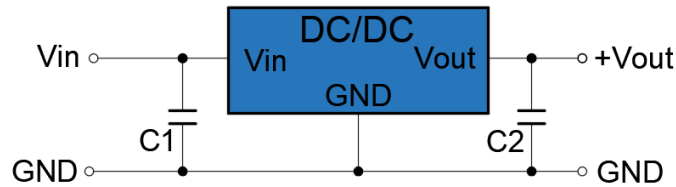


Figure 1: Typical application circuit

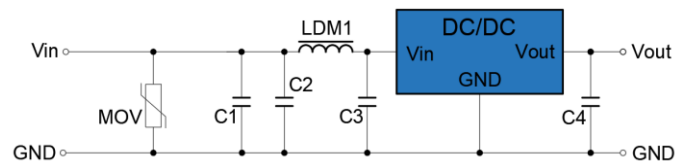


Figure 2: negative output application

Notes:

1. C1 and C2 are required for the operating, and to be connected as close to the converter as possible.
2. These converters are not allowed to use in parallel or hot plug without support from properly designed external circuits.

Recommend component specifications

Model Number	C1, C3	C2, C4
$V_{OUT}=3.3, 5, 6.5V$	47uF, 100V	22uF, 10V
$V_{OUT}=9V$	47uF, 100V	22uF, 16V
$V_{OUT}=12, 15V$	47uF, 100V	22uF, 25V
$V_{OUT}=24V$	47uF, 100V	22uF, 50V

Recommended component spec

Component	MOV	LDM1	C1	C2	C3
Spec	S20K30	120uH	270~470uF	1~3.3uF	0.68~2.2uF

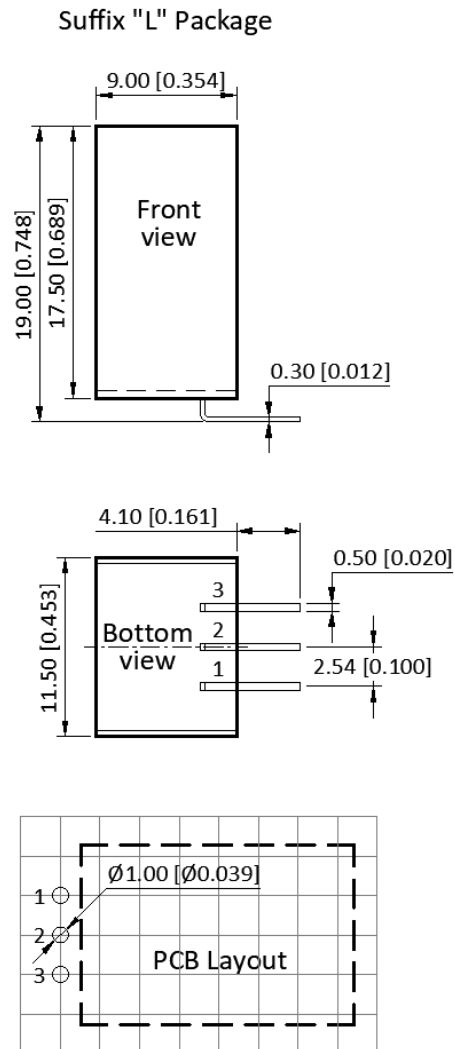
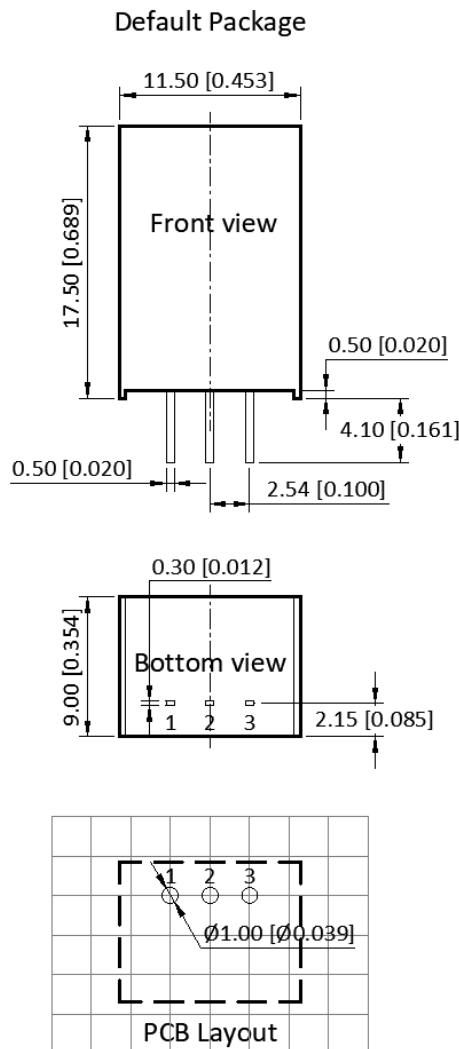
*C4 Refer to C2 in [Table 1]

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Mechanical Specifications



Note:

- * 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

Pin Definition

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

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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	29-08-2025	First issue of document