1A, DC/DC Power Converter

SDX10S

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Introduction

The SDX10S series are 1A 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: 1A Max
→ Non-isolated, step-down switching regulators
→ Input range: 6.0~36VDC
→ Regulated single output
→ High efficiency up to 96%
→ Low ripple and noise
→ Low no load input current, 0.2mA only
→ 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}	
SDX10S033	24	6	36	3.3	1000	90	81	680
SDX10S050	24	8	36	5	1000	93	86	680
	12	8	27	-5	-500	86	82	330
SDX10S065	24	10	36	6.5	1000	93	87	680
SDX10S090	24	13	36	9	1000	95	90	680
SDX10S120	24	16	36	12	1000	96	93	680
	12	8	20	-12	-300	89	88	330
SDX10S150	24	20	36	15	1000	96	94	680
	12	8	18	-15	-300	89	89	330
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. SDX10S050L, SDX10S150L.

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Electrical characteristics

Unless otherwise indicated, specifications are measured at T_A=25°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.	-	0.1	1.0	mA	
Output voltage accuracy Full load	RM10S-033 Other models	-	±2 ±2	±4 ±3	%	
Line regulation	V_{IN} = Min. to Max.	-	±0.2	±0.4	%	
Load regulation	I_{OUT} = 10%~100%	-	±0.4	±0.6	%	
Temperature coefficiency	-40°C~+85°C	-	-	0.03	%/°C	
Output ripple and noise 20MHz bandwidth, peak to peak		-	20	75	mV	
Dynamic load response I_{OUT}=25%~50%~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

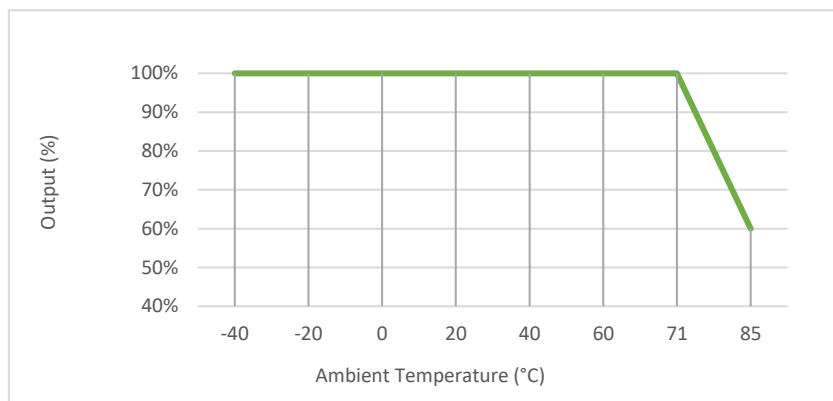| Parameters	Condition	Min.	Typ.	Max.	Unit
Operating temperature		-40	-	+85	°C
Storage temperature		-55	-	+125	°C
Storage humidity	Non-condensing	5	-	95	%RH
Switching frequency **Full load**	V_{OUT} = 3.3, 5, 6.5V Others	420 580	520 680	620 780	KHz
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	260	°C
Cooling method		Free air convection			
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	Standard models Suffix "L" models	11.50 x 9.00 x 17.50 mm, 3.8g Typ. 17.50 x 11.50 x 9.00 mm, 3.8g Typ.			

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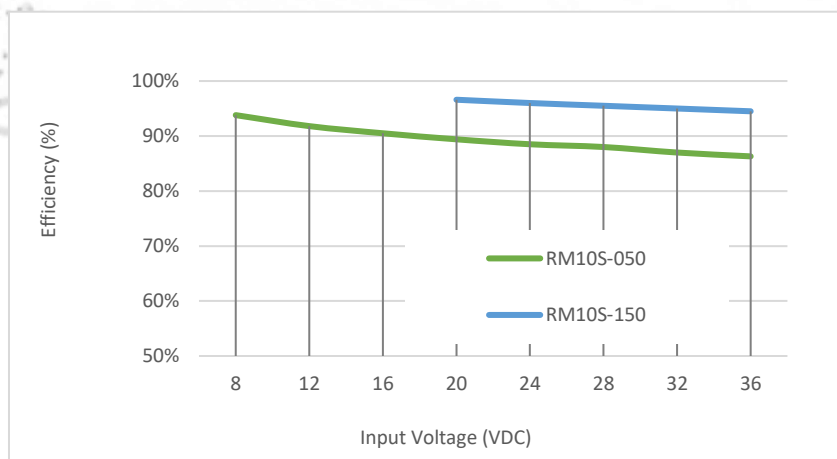
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Characteristics Curves
Derating Curve
Output vs Ambient Temperature

Efficiency vs Input Voltage

Full Load

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Efficiency vs Load
Nominal input voltage
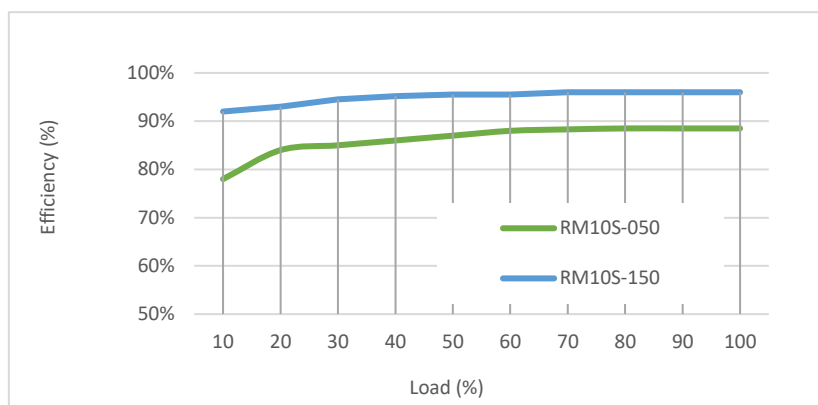
1A, DC/DC Power Converter

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Recommended External Circuit

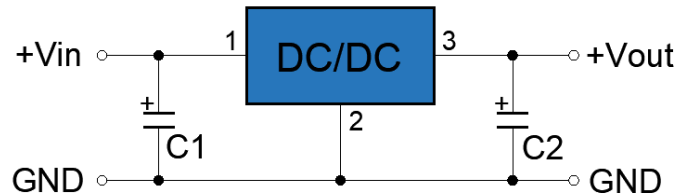**Typical Application Circuit**

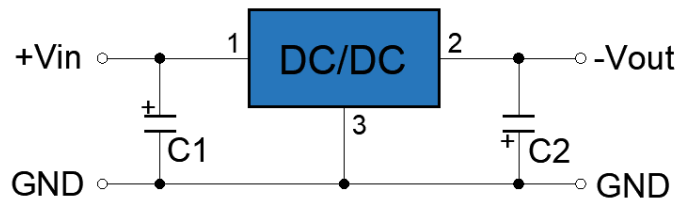Figure 1: positive output application
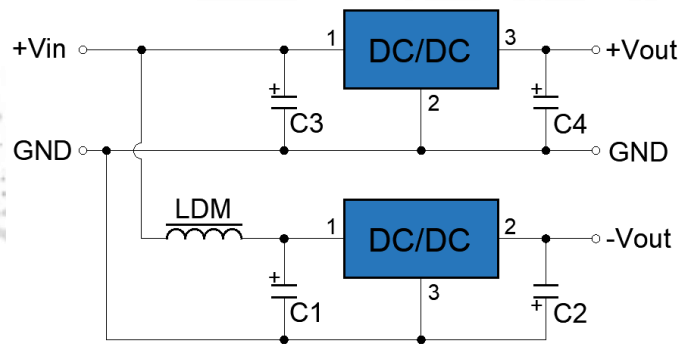

Figure 2: negative output application

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
SDX10S033	10uF, 50V	22uF, 10V
SDX10S050	10uF, 50V	22uF, 10V
SDX10S065	10uF, 50V	22uF, 10V
SDX10S090	10uF, 50V	22uF, 16V
SDX10S120	10uF, 50V	22uF, 25V
SDX10S150	10uF, 50V	22uF, 25V

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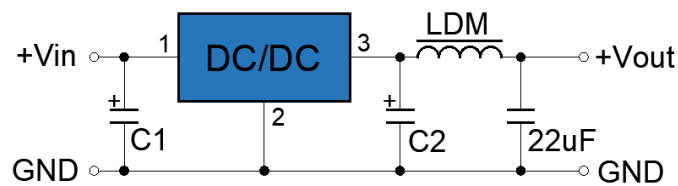
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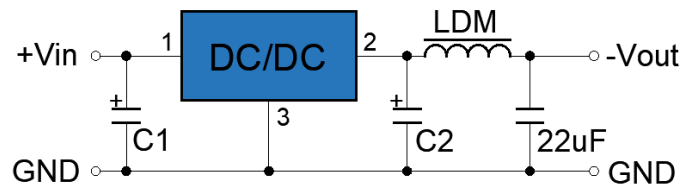## Recommended External Circuit (continued)

Output Filtering Circuit

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

Figure 4, recommended output filtering circuit
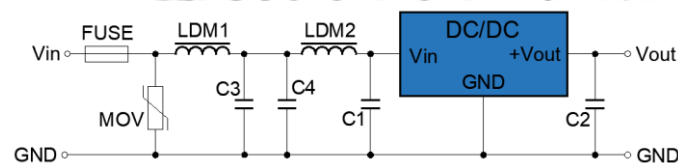

Positive output

Negative output

Circuit for EMC Enhancement

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

Figure 5: Circuit for EMC Enhancement

Recommended component spec

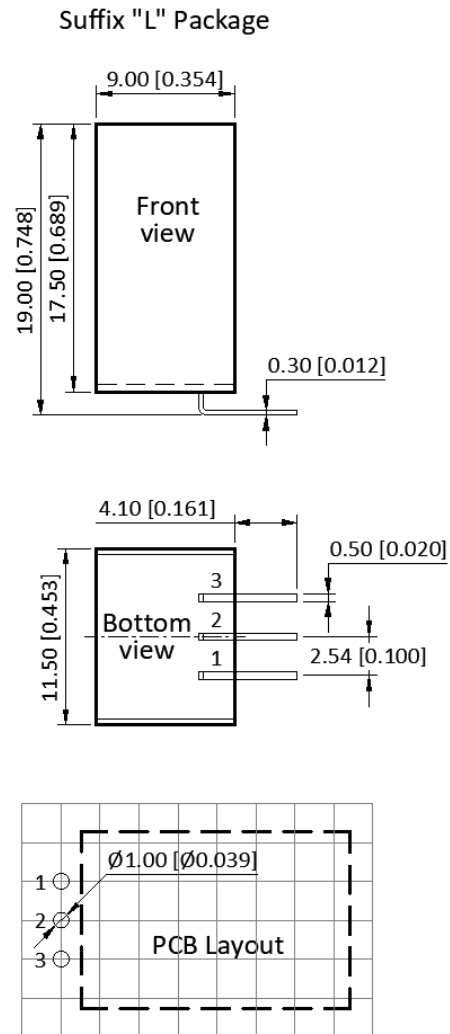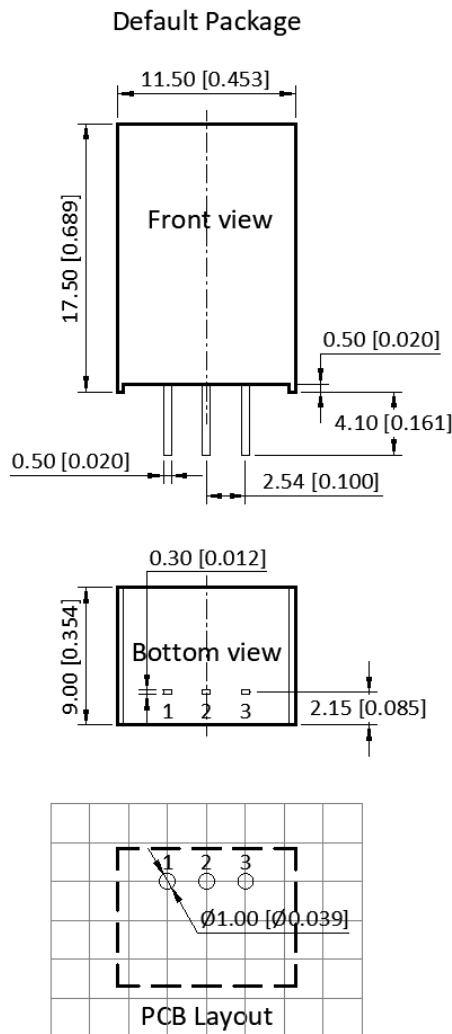| Component	MOV	LDM1	LDM1	C3	C4
Spec	20D470K	82uH	12uH	680uH, 50V	4.7uF, 50V

*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

Default Package

11.50 [0.453]

17.50 [0.689]

Front view

0.50 [0.020]

4.10 [0.161]

0.50 [0.020]

2.54 [0.100]

0.30 [0.012]

9.00 [0.354]

Bottom view

1 2 3

2.15 [0.085]

1 2 3

Ø1.00 [Ø0.039]

PCB Layout

Suffix "L" Package

9.00 [0.354]

19.00 [0.748]

17.50 [0.689]

Front view

0.30 [0.012]

4.10 [0.161]

0.50 [0.020]

3
2
1

2.54 [0.100]

11.50 [0.453]

Bottom view

1
2
3

Ø1.00 [Ø0.039]

PCB Layout

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	27-08-2025	First issue of document

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