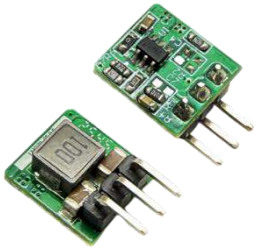
SK-78Lxx-500R4

Product Feature

- Package Type：SIP3 industrial standard
- Operating temperature range: -40℃ - +85℃
- High efficiency：95%
- Output short circuit protection
- Applications: industry, electric power, instrumentation, communications, rail transit, etc



CE
EN62368-1

Selection Guide

Certification	Part No.	Input Voltage (VDC)①	Output		Full Load Efficiency (%)Min.Vin/Max.Vin	Capacitive Load (μF)Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max.		
EN	SK-78L03-500R4	24 (4.75-36)	3.3	500	92/81	680
	SK-78L05-500R4	24 (6.5-36)	5	500	93/84	680
		12 (7-31)	-5	-300	80/81	330
	SK-78L09-500R4	24(12-36)	9	500	93/86	680
	SK-78L12-500R4	24 (15-36)	12	500	94/91	680
		12 (8-24)	-12	-150	84/85	330
	SK-78L15-500R4	24 (19-36)	15	500	95/92	680
		12 (8-21)	-15	-150	85/87	330

Notes:

①For input voltage exceeding 30 VDC, an input electrolytic capacitor of 22uF/50V is required to prevent the module from being damaged by voltage spikes.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current(No-Load)	Positive output	--	0.5	1.5	mA
Reverse Polarity at input		Avoid/Not protected			
Input Filter		Capacitor filter			

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Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load, input voltage range	3.3VDC Output	--	±2.0	±4.0	%
		Other output	--	±2.0	±3.0	
Linear Regulation	Full load, input voltage range		--	±0.2	±0.4	
Load Regulation	Nominal input,10% -100% load	3.3/±5VDC Output	--	±0.6	--	
		Others	--	±0.3	--	
Ripple & Noise	20MHz bandwidth,10%-100% load,parallel cable method		--	40	100	mVp-p
	20MHz bandwidth,0%-10% load,parallel cable method		--	--	2	%Vo
Transient Recovery Time	Nominal input,25% Load Step Change		--	0.2	1	ms
Transient Response Deviation			--	50	250	mV
Temperature Coefficient	Operating ambient temperature -40℃ to +85℃		--	--	±0.03	%/℃
Short-Circuit Protection	Nominal input		Continuous,Self-Recovery			

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	Derating when operating temperature≥71℃(See Fig.1)	-40	--	+85	℃
Storage Temperature		-55	--	+125	℃
Storage Humidity	Non-condensing	5	--	95	%RH
Soldering Profile	Wave-soldering	260±5℃; time:5 - 10s			
	Manual-welding	360±10℃;time:3 - 5s			
Switching Frequency	Full load,nominal input	--	500	--	kHz
MTBF	MIL-HDBK-217F@25℃	2000	--	--	k hours

Mechanical Specifications

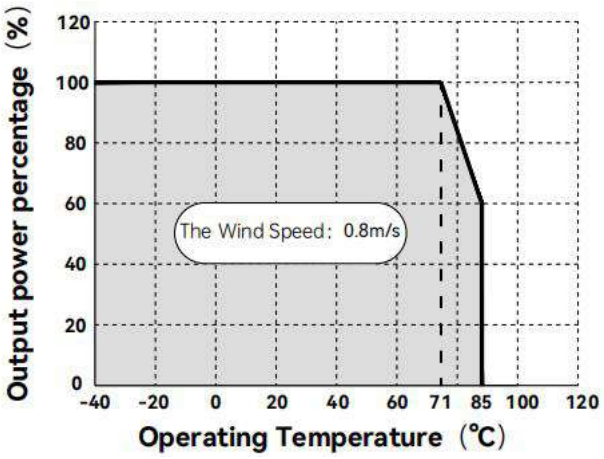
Package Dimensions	10.00*7.20*11.00mm
Weight	1.1g (Typ.)
Cooling Method	Free air convection

EMC Specifications

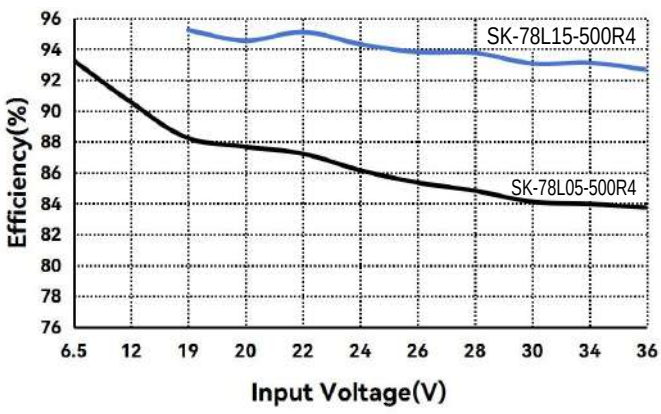
EMI	CE	CISPR32/EN55032 CLASS B (see Fig. 5-② for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig. 5-② for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2 Contact±4KV	Perf.Criteria B
	RS	IEC/EN61000-4-3 10V/m	Perf.Criteria A
	EFT	IEC/EN61000-4-4 ±1KV (see Fig. 5-① for recommended circuit)	Perf.Criteria B
	CS	IEC/EN61000-4-6 3Vr.m.s	Perf.Criteria A

Typical Characteristic Curves

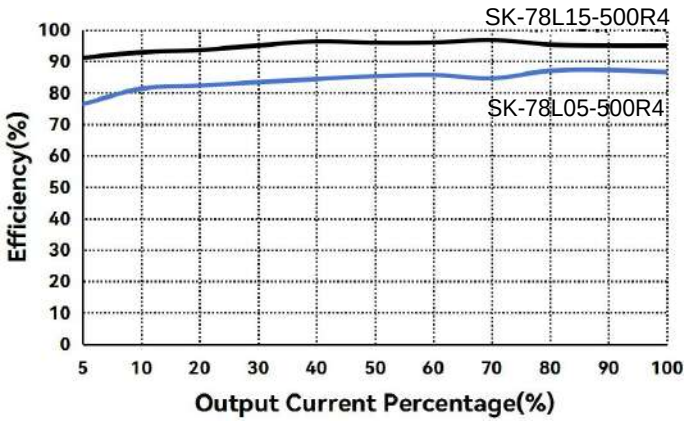
Temperature Derating Curve （Fig.1）



Efficiency VS Input Voltage (Full load)



Efficiency VS Output Load（Vin=24V）



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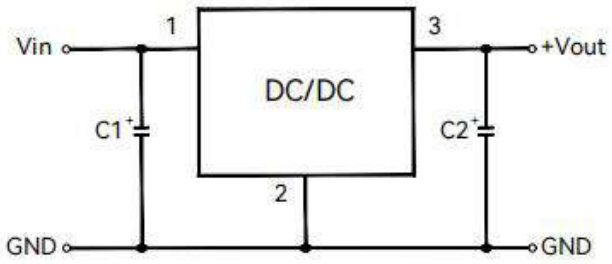
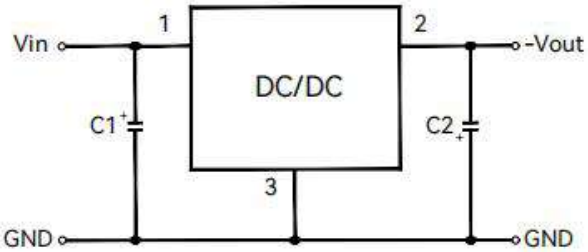
Typical Circuit Design And Application

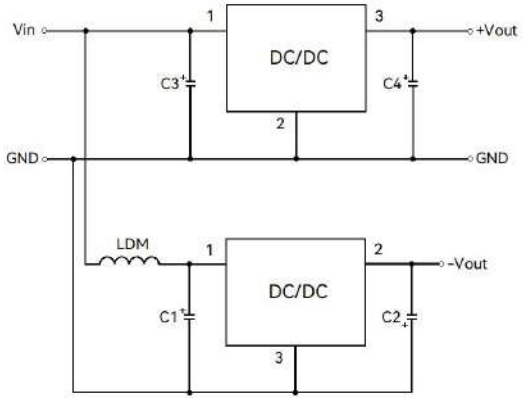
Positive output application circuit（Fig.2）



Negative output application circuit（Fig.3）



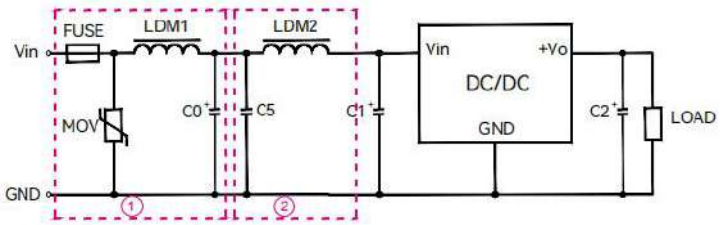
Positive and negative output application circuit（Fig.4）



Recommended component parameters(Table 1)

Part No.	C1/C3(uF)	C2/C4(uF)
SK-78L03-500R4	10uF/50V	22uF/10V
SK-78L05-500R4		22uF/10V
SK-78L09-500R4		22uF/25V
SK-78L12-500R4		22uF/25V
SK-78L15-500R4		22uF/25V

EMC Recommended compliance circuit（Fig.5）



Notes：For EMC tests we use part ① in Fig.5 for immunity and part ② for emissions test.selecting based on needs.

EMC Recommended component parameters

Part No.	Vin:24V
FUSE	Selected fuse value according to actual input current
MOV	20D470K
LDM1	82uH
C0	680uF/50V
C1/C2	Refer to table 1
C5	4.7uF/50V
LDM2	12μH

Notes:

1. The required C1 and C2 (C3 and C4) capacitors must be connected as close as possible to the terminals of the module;
2. Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values; For certain applications, increased values for C2 and C4 and/or tantalum or low ESR electrolytic capacitors may also be used instead;
3. Converter cannot be used for hot swap and with output in parallel.
4. When using configurations as shown in Fig.4, we recommended to add an inductor (LDM) with a value of up to 10-47μH which helps reducing mutual interference;

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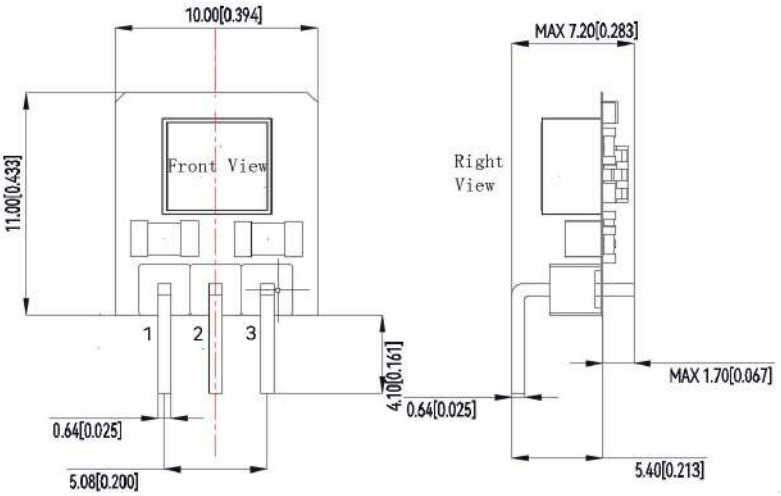
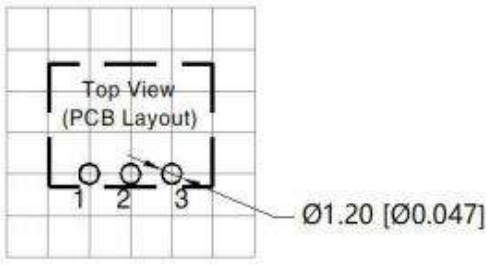
Dimension Diagram and Recommended PCB Layout

Dimension Diagram	PCB Printing Layout





Note: Grid 2.54*2.54mm

Note:

Unit: mm[inch]

Pin section tolerances:±0.10[±0.004]

General tolerances:±0.50[±0.020]

Pin Definition Table

Pin	Positive output	Negative output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND

Packaging instructions

Packaging information

Model series	Product quantity (pcs/ tray)	Inner carton quantity (pcs/ carton)	Outer carton quantity (pcs/ carton)
SK-78Lxx-500R4	270	810	2430

Notes:

- Maximum capacitive loads are tested in the input voltage range and under full load conditions;
- Unless otherwise specified,parameters in this data sheet were measured under the conditions of Ta=25℃， humidity<75%RH with nominal input voltage and rated output load;
- Our company can provide product customization, specific needs can directly contact our technical personnel;
- All index test methods are based on our company's enterprise standards;