



DESCRIPTION

Wide Input voltage, non-isolated and regulated single output.

The AD-K78xx-500R3 series are high-efficiency switching regulators, ideal substitutes for the A78xx series of three-terminal linear regulators.

The AD-K78xx-500R3 features are high efficiency, low loss, and without heat sink. Widely used in industrial control, instrumentation, and electric power.

FEATURES

- High efficiency up to 95%
- Support negative output perfectly.
- -40°C to +85°C Working Temperature Range
- Output short-circuit protection.
- Industry-standard SIP-3 package
- Low ripple and noise.

ORDERING INFORMATION

Part Number	Input Voltage (VDC)	Output		Full Load Efficiency(%) Min/Max		Capacitive Load (uF) Max.
	Nominal (Range)	Voltage (VDC)	Current (mA) Max/Min			
AD-K7803-500R3	24 (4.75-36)	3.3	500	89	80	680
AD-K7805-500R3	24 (6.5-36)	5	500	90	84	680
	12 (7-31)	-5	-300	80	81	330
AD-K7809-500R3	24 (12-36)	-59	500	93	90	680
AD-K7812-500R3	24 (15-36)	12	500	94	91	680
	12 (8-24)	-12	-150	84	85	330
AD-K7815-500R3	24 (19-36)	15	500	95	93	680
	12 (8-21)	-15	-150	85	87	330

**INPUT SPECIFICATIONS**

Item	Operating Conditions	Min	Typ	Max	Unit
No-load Power Consumption	100% load, input voltage range	--	0.12	0.256	W
Reverse Polarity	Input voltage range	Forbidden			
Input Filter	10%-100% load	Capacitor Filter			

OUTPUT SPECIFICATIONS

Item	Operating Conditions		Min	Typ	Max	Unit
Output Load	Load Percentage		10	--	100	%
Load Regulation	10~100% Load	3.3/5VDC Output		±0.6		%
		Others		±0.3		
Linear Regulation	Full load, Input voltage range		--	±0.2	±0.4	%
Output Voltage Accuracy	100% load. Input voltage range.	AD-K7803-500R3	--	±2.0	±4.0	%
		Others		±2.0	±3.0	
Ripple & Noise	Pure resistance load, 20MHz bandwidth peak-to-peak value 10~100% load		--	20	75	mVp-p
Temperature Drift Coefficient (Work temperature -40 °C~85 °C)			--	--	±0.03	%/°C
Output Short Circuit Protection			Continuous, self-recovery			
Transient response deviation	Nominal input, 25% load step change.			50	250	mv
Transient recovery time				0.2	1	ms

GENERAL SPECIFICATIONS

Item	Test Condition	Min	Typ	Max	Unit
Operating Temperature	Refer to Fig1. Temperature Derating	-40	--	+85	°C
Storage Temperature		-40	--	+125	°C
Storage Humidity	No Condensation	5	--	95	%RH
Pin Soldering Temperature	Solder joint distance from housing				
Resistance	1.5mm, 10s	--	--	+300	°C
Switching Frequency	Full load, nominal voltage input	550	--	850	KHz
Housing Material	Black flame retardant & heat resistant plastic (UL94V-0)				
MTBF	MIL-HDBK-217F@25°C	2000			KHrs
Cooling Method	Free air Convection				



EMC SPECIFICATIONS

EMI	Conducted Disturbance	CISPR32/EN55032 CLASS B	See Fig 10.
	Radiated Emission	CISPR32/EN55032 CLASS B	See Fig 10.
EMS	Electrostatic Discharge	IEC/EN 61000-4-2 Contact $\pm 4\text{KV}$	Pert. Criteria B
	Radiation Immunity	IEC/EN 61000-4-3 10V/m	Pert. Criteria A
	EFT	IEC/EN 61000-4-4 $\pm 1\text{KV}$	See Fig 10.
	Surge Immunity	IEC/EN 61000-4-5 $\pm 1\text{KV}$	See Fig 10.
	Conducted Disturbance Immunity	IEC/EN 61000-4-6 3Vr.m.s	Pert. Criteria A
	Voltage dip, Drop and Short interruption	IEC/EN 61000-4-29 0%-70%	Pert. Criteria B

TYPICAL CHARACTERISTIC CURVES

Fig 1.

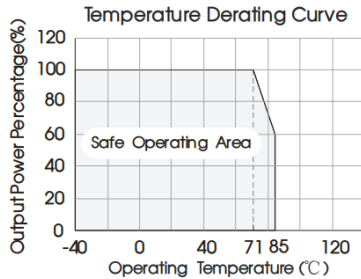


Fig 2. Efficiency vs. Input Voltage (Full Load)

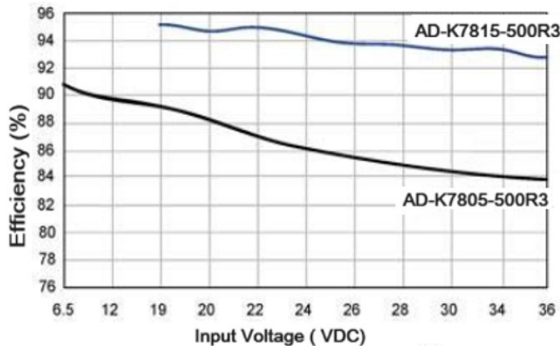


Fig 3. Efficiency vs. Output Load (Nominal)

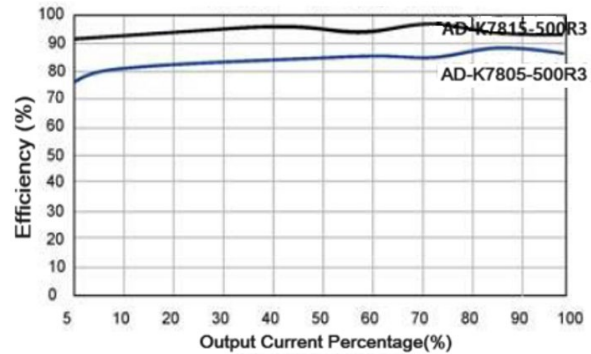


Fig 4. Negative Output Efficiency vs. Input Voltage (Full Load)

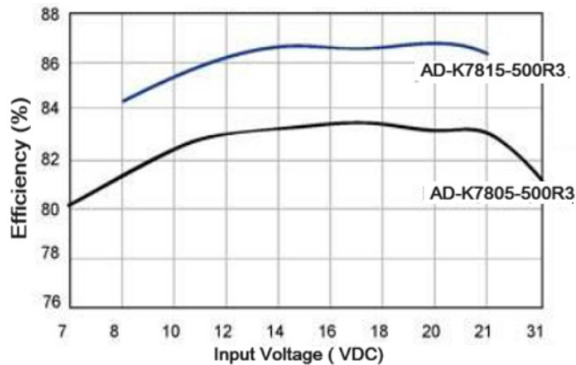
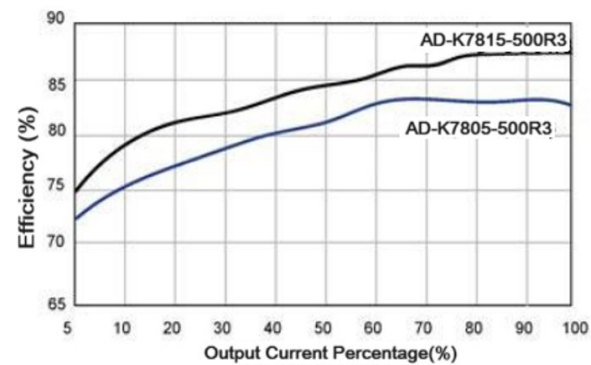


Fig 5. Negative Output Efficiency vs. Output Load





DESIGN REFERENCE

Typical Application

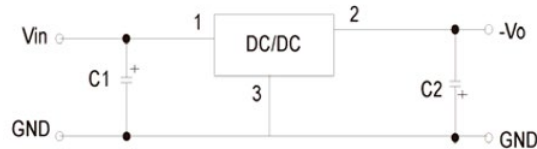
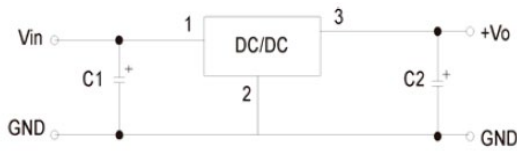
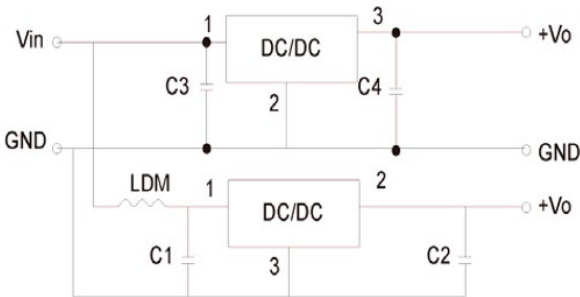


Fig 8. Positive and Negative output application circuit

Table 1. Recommended capacitive load value



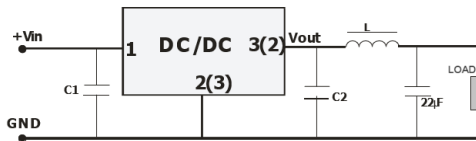
Item.	C1 /C3*	C2/C4*
AD-K7803-500R3	10uF/50V	22uF/10V
AD-K7805-500R3		22uF/10V
AD-K7809-500R3		22uF/16V
AD-K7812-500R3		22uF/25V
AD-K7815-500R3		22uF/25V

* C1~C4 are Ceramics Capacitor

Note:

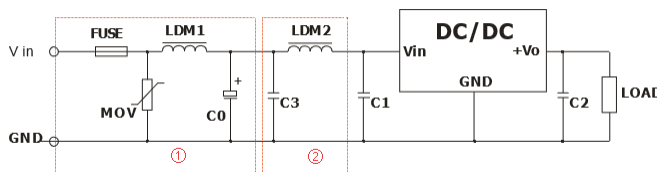
- 1.The external capacitors need to be used that like “typical application”, then the C1 and C2 must be added in the circuit, and they should be placed as near as the products’ footprints. Others apply to the application-environment.
- 2.The capacitance of C1, C2 sees external capacitor table 1, it can be increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
- 3.When the products used as the circuit like Fig 3, an inductor named as LDM up to 10μH is recommended in the circuit to reduce the mutual interference.
- 4.The output needs to add a dummy load of not less than 5mA, when the input voltage of models negative output is less than 4.85V.
- 5.Cannot use in parallel for output and hot swap for input.
- 6.To reduce the output ripple furtherly, it is suggested to connect a “LC” filter at the output terminal, and recommended value of L is 10μH-47μH. See Fig 9, LC filter application.

Fig 9.



EMC Recommend Circuit

Fig 10.



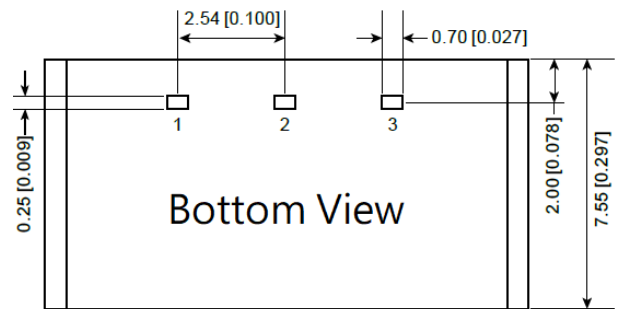
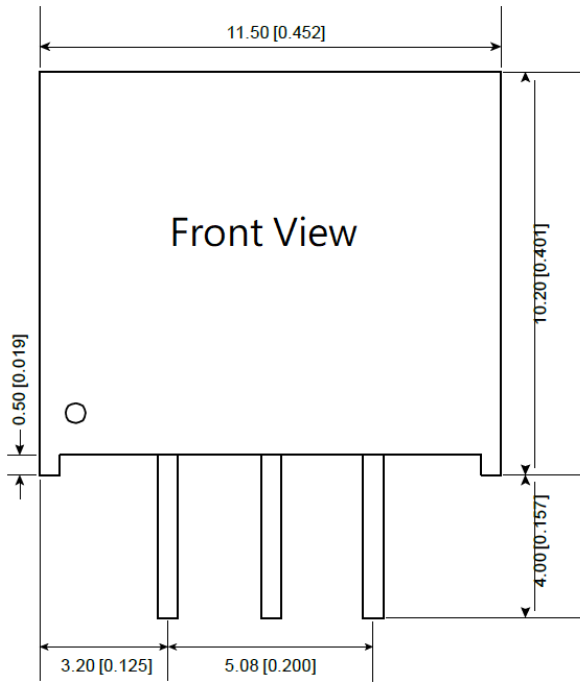
FUSE	MOV	LDM1	LDM2	C0	C1/C2	C3
Select fuse value according to actual input current	20D470K	82uH	12uH	680uF	Table 1	4.7uF

Table 2. Recommend EMC Reference Value



PACKAGE INFORMATION

SIP3 Package Dimension: 11.50x7.55x10.2 mm (0.453x0.297x0.401 inch)



Note:

Unit: mm (inch)

General tolerances: ± 0.25

Pin-Out		
Pin #	Positive Output	Negative Output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND