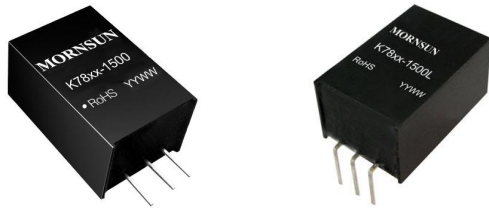


Wide input voltage Non-isolated and Regulated Single Output



Patent Protection **RoHS**

## FEATURES

- High efficiency up to 95%
- Low Ripple & Noise
- Short-circuit protection and Over temperature Protection
- Pin compatible with LM78XX series
- Operating ambient temperature range -40°C to +85°C
- Subminiature SIP package; meets UL94-V0 requirement

*K78xx-1500(L) series are high efficiency switching regulators and ideal substitutes for 78 series three-terminal linear regulators. The converters feature high efficiency of up to 95%, with low loss, low radiation and no need for heat sink. They are widely used in applications such as industrial control, instrumentation and electric power.*

## Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Vin Min. / Vin Max.	Max. Capacitive Load (µF)
	Nominal (Range)	Voltage (VDC)	Current (mA)		
K7803-1500(L)	12 (4.75-18)	3.3	1500	91/88	1000
K7805-1500(L)	12 (6.5-18)	5	1500	93/91	
K78X6-1500(L)	12 (8-18)	6.5	1500	95/93	

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Power Consumption	Input voltage range	--	0.09	0.18	W
Input Filter		Capacitance filter			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	100% load, input voltage range	--	±2	±3	%
Linear Regulation	Input voltage range	--	±0.5	±0.75	
Load Regulation	10%-100% load	--	±0.5	±1.0	
Ripple & Noise*	20MHz bandwidth (refer to Fig. 2)	--	25	45	mVp-p
Temperature Coefficient	Operating ambient temperature -40°C to +85°C	--	--	±0.03	%/°C
Over temperature Protection	IC built-in	--	160	--	°C
Short-circuit Protection		Continuous, self-recovery			
Transient Response Deviation	Nominal input, 25% load step change	--	100	250	mV
Transient Recovery Time		--	0.5	3	ms
Thermal Impedance		--	60	--	°C / W

\*Note:

The "parallel cable" method is used for Ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.

## General Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Operating Temperature*	Derating if the temperature ≥71°C (see Fig. 1)	-40	--	85	°C
Storage Temperature		-55	--	125	

Lead Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, input voltage range	300	340	380	KHz
MTBF	MIL-HDBK-217F@25°C	2000	--	--	K hours

\*Note:  
The When K7803-1500 (L) part requires an input voltage  $\geq 5V$  for operation at  $-40^{\circ}C$ .

### Mechanical Specifications

Case Material	Black plastic flame-retardant and heat-resistant (UL94-V0)				
Dimensions	K78xx-1500	11.50 x 9.00 x 17.50 mm			
	K78xx-1500L	11.50 x 9.00 x 19.00 mm			
Weight	4.0g (Typ.)				
Cooling Method	Free air convection				

### Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 4-② for recommended circuit)		
	RE	CISPR32/EN55032	CLASS B (see Fig. 4-② for recommended circuit)		
Immunity	ESD	IEC/EN 61000-4-2	Contact $\pm 4KV$		perf. Criteria B
	RS	IEC/EN 61000-4-3	10V/m		perf. Criteria A
	EFT	IEC/EN 61000-4-4	$\pm 1KV$ (see Fig. 4-① for recommended circuit)		perf. Criteria B
	Surge	IEC/EN 61000-4-5	$\pm 1KV$ (see Fig. 4-① for recommended circuit)		perf. Criteria B
	CS	IEC/EN 61000-4-6	3V <sub>rms</sub>		perf. Criteria A
	Voltage dip, drop and short interruption	IEC/EN 61000-4-29	0%-70%		perf. Criteria B

### Typical Characteristic Curves

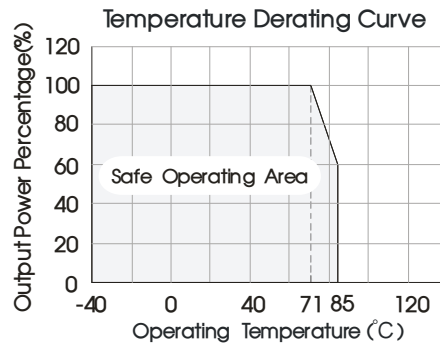
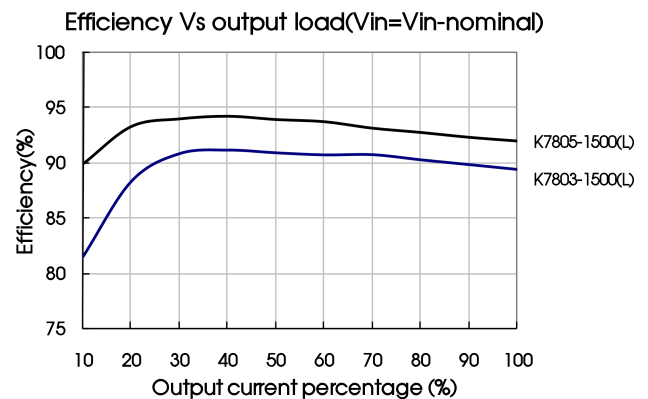
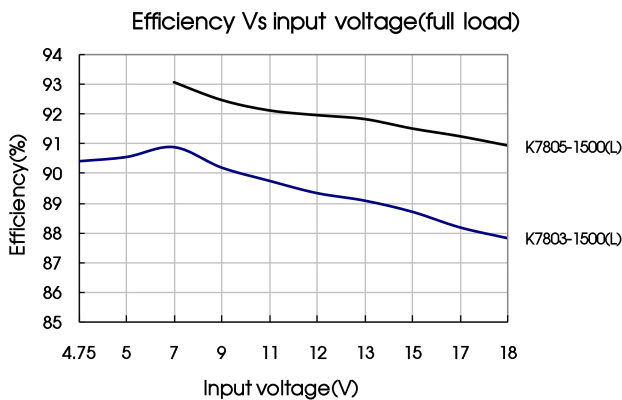
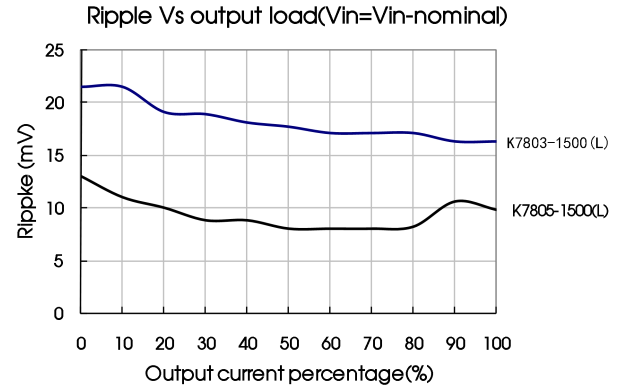
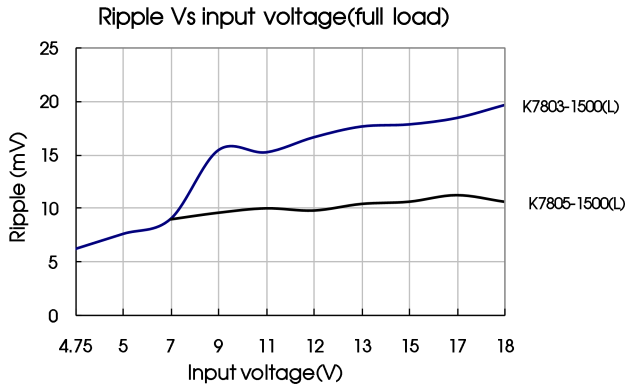


Fig. 1





## Design Reference

### 1. Typical application

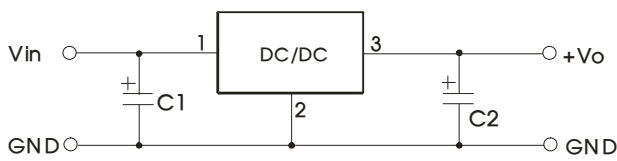


Fig. 2 Typical application

Part No.	C1 (ceramic capacitor)	C2 (ceramic capacitor)
K7803-1500(L)	10uF/25V	22μF/6.3V
K7805-1500(L)		22μF/16V
K78X6-1500(L)		22μF/16V

- Notes:
1. The required capacitors C1 and C2 must be connected as close as possible to the terminals of the module.
  2. For capacitor values of C1 and C2 refers to the table above. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitor may also be used instead.
  3. Converter cannot be used for hot swap and with output in parallel.
  4. To further reduce the output ripple and noise, we suggested the use of a "LC" filter at the output terminals, with an inductor value (L) of 10μH-47μH.

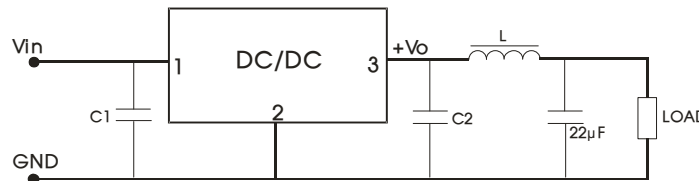


Fig. 3

### 2. EMC compliance circuit

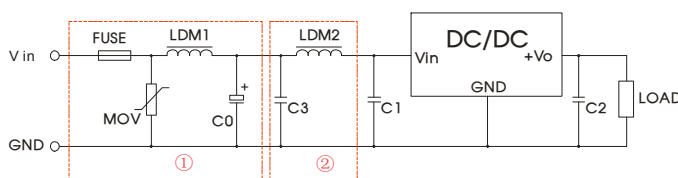


Fig. 4 Recommended EMC circuit

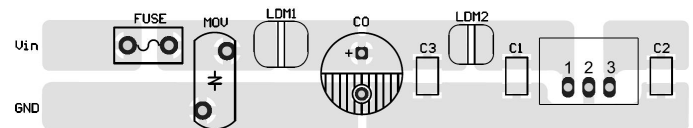


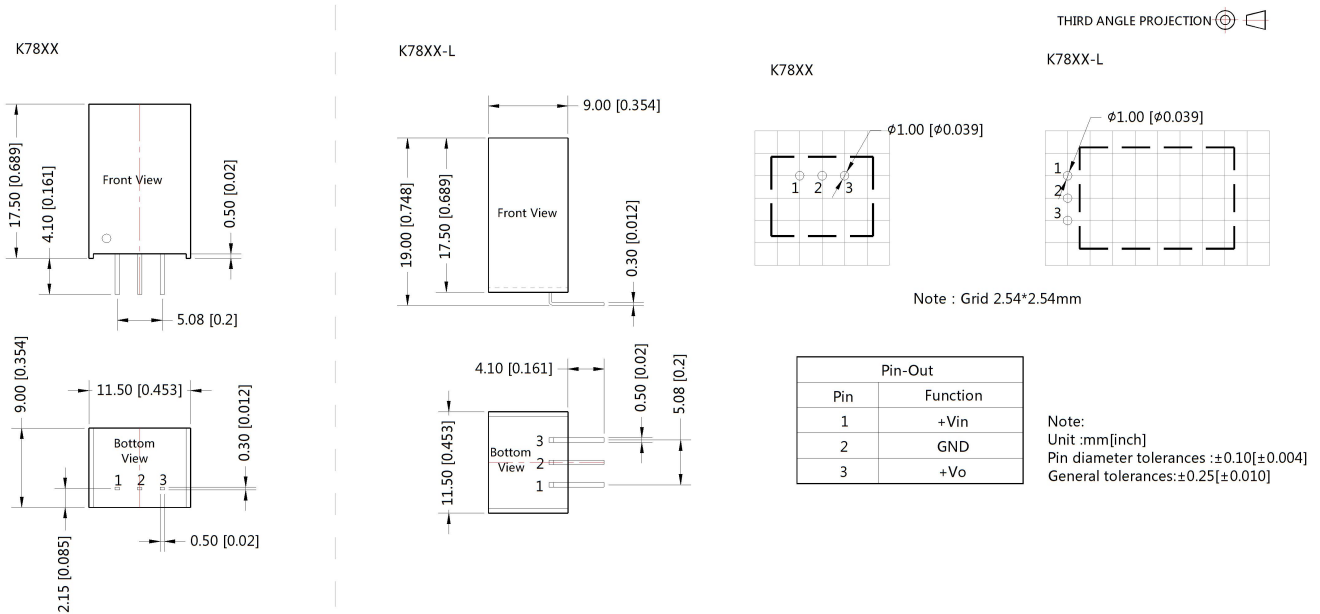
Fig.5 Recommended EMC circuit-PCB layout

FUSE	MOV	LDM1	C0	C3	C1/C2	LDM2
Select fuse value according to actual input current	S14K35	82μH	680μF /50V	4.7μF /50V	Refer to Fig.2	12μH

Note: Part ① in Fig. 4 shows EMS compliance filter and part ② filter for EMI compliance; depending on requirement both filters ① and ② can be used in series.

3. For additional information please refer to DC-DC converter application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



Notes:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58210021(K78xx-1500), 58210027 (K78xx-1500L);
- The max. capacitive load should be tested within the input voltage range and under full load conditions;
- Unless otherwise specified, data in this datatable should be tested under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75% when inputting nominal voltage and outputting rated load;
- All index testing methods in this datatable are based on our Company's corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China  
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: sales@mornsun.cn www.mornsun-power.com