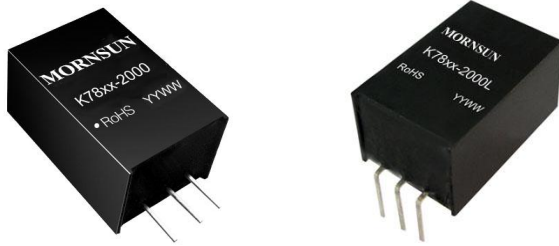


Wide input voltage Non-solated and Regulated Single Output



Patent Protection RoHS

FEATURES

- High efficiency up to 92%
- 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-2000(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 92%, with low loss, low radiation and no need for additional 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) Max.		
K7801-2000L	12 (4.75-18)	1.5	2000	79/76	1000
K78X2-2000	12 (4.75-18)	1.8	2000	81/79	
K7802-2000	12 (4.75-18)	2.5	2000	85/83	
K7803-2000(L)	12 (4.75-18)	3.3	2000	87/86	
K7805-2000(L)	12 (7-18)	5	2000	91/88	
K78X6-2000(L)	12 (8.5-18)	6.5	2000	92/91	

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			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
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	-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 $\geq 71^{\circ}\text{C}$ (see Fig. 1)	-40	--	85	°C
Storage Temperature		-55	--	125	
Pin Soldering Resistance 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:
When K7803-2000 (L) work at -40°C , the product requires input voltage $\geq 5\text{V}$.

Mechanical Specifications

Case Material	Black plastic flame-retardant and heat-resistant (UL94-V0)	
Dimensions	K78xx-2000	11.50 x 9.00 x 17.50mm
	K78xx-2000L	11.50 x 9.00 x 19.00mm
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 $\pm 4\text{KV}$ perf. Criteria B
	RS	IEC/EN 61000-4-3	10V/m perf. Criteria A
	EFT	IEC/EN 61000-4-4	$\pm 1\text{KV}$ (see Fig. 4-① for recommended circuit) perf. Criteria B
	Surge	IEC/EN 61000-4-5	$\pm 1\text{KV}$ (see Fig. 4-① for recommended circuit) perf. Criteria B
	CS	IEC/EN 61000-4-6	3Vr.ms perf. Criteria A
	Voltage dip, drop and short interruption	IEC/EN 61000-4-29	0%-70% perf. Criteria B

Typical Characteristic Curves

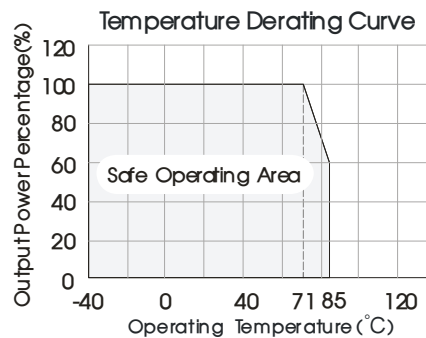
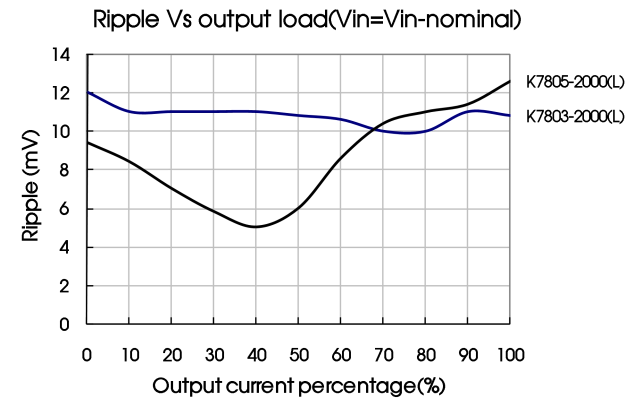
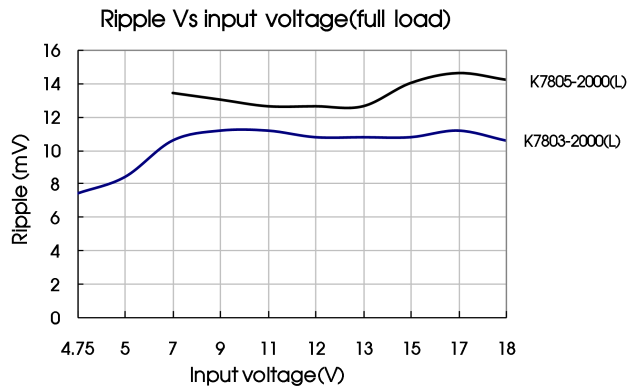
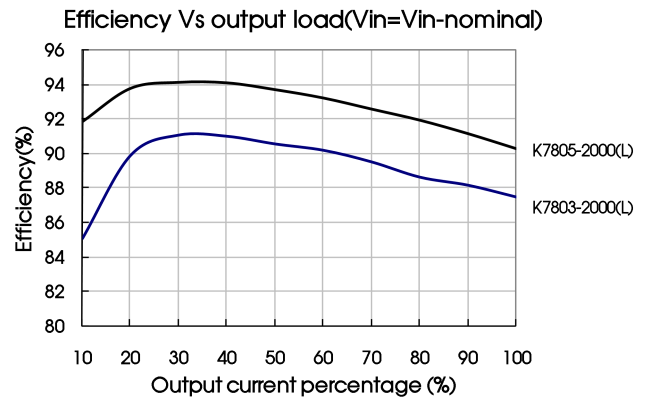
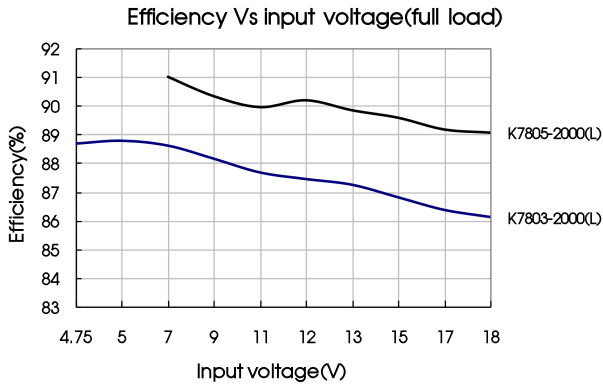


Fig. 1



Design Reference

1. Typical application

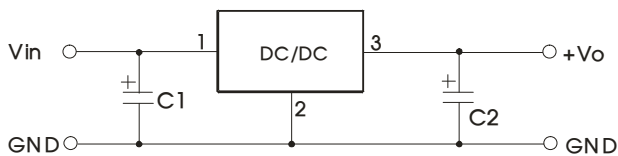


Fig. 2 Typical application circuit

Part No.	C1 (ceramic capacitor)	C2 (ceramic capacitor)
K7801-2000L	10μF/25V	22μF/6.3V
K78X2-2000		22μF/6.3V
K7802-2000		22μF/6.3V
K7803-2000(L)		22μF/6.3V
K7805-2000(L)		22μF/16V
K78X6-2000(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.

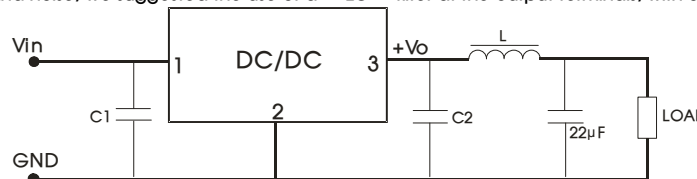


Fig. 3

2. EMC compliance circuit

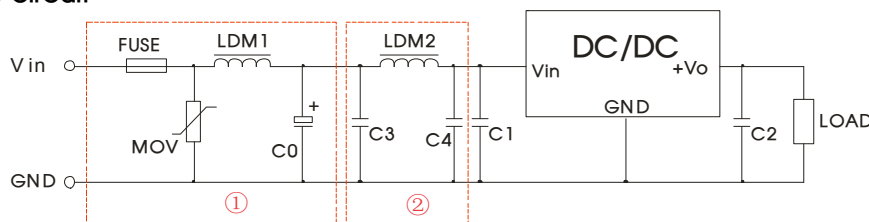


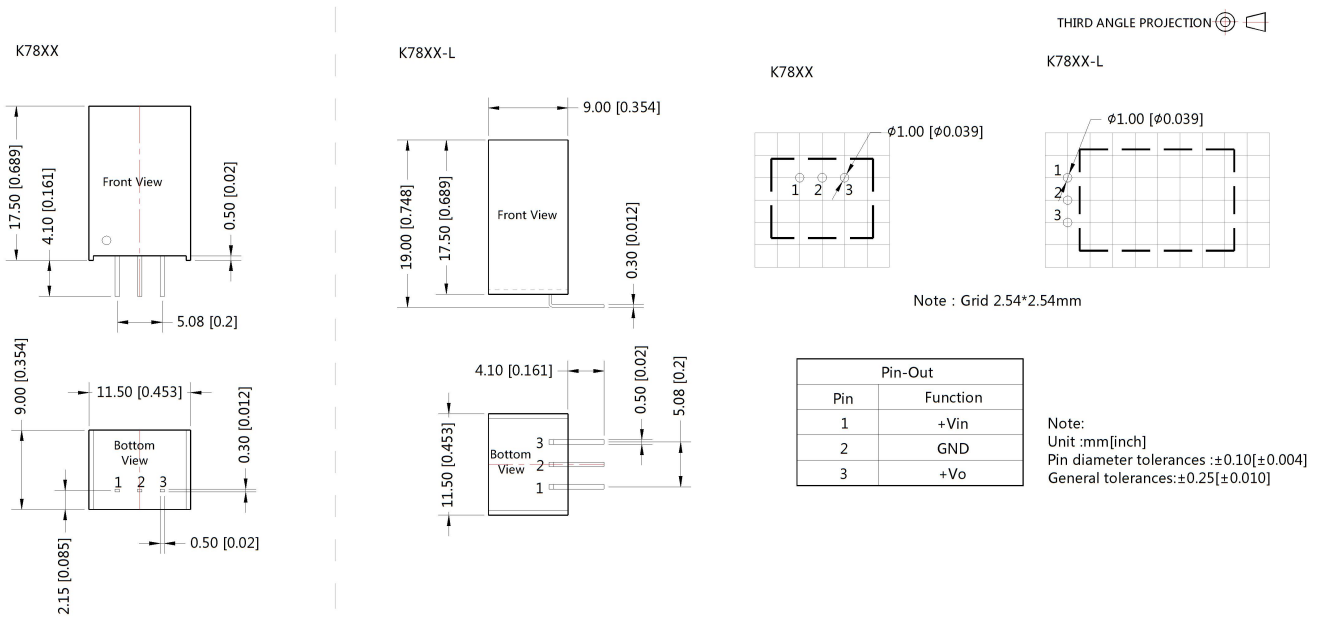
Fig. 4 EMC compliance circuit

FUSE	MOV	LDM1	C0	C3	C4	C1/C2	LDM2
Select fuse value according to actual input current	S14K20	82μH	680μF /50V	4.7μF /50V	10μF/25V	Refer to Fig.2	12μH

Notes: 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.

- It is not allowed to connect modules in parallel for increased output power
- For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210021(K78xx-2000)、58210027(K78xx-2000L);
- 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.

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