

Patent Protection RoHS

K78UXX-500(L) Series

Wide input non-isolated and regulated single output

FEATURES

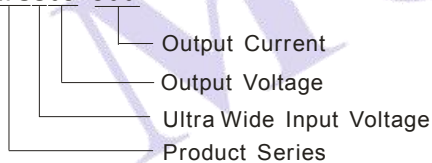
- High efficiency up to 95%
- Ultra-wide input voltage range up to 8:1
- Operating ambient temperature range: -40 to +85°C
- Pin-out compatible with LM78XX linear regulators
- Short-circuit protection, over-temperature protection
- Low output ripple & noise
- Ultra compact SIP package, meet UL94-V0 standards
- No heatsink required
- Industry standard pin-out
- MTBF>2,000,000 hours

APPLICATIONS

The K78UXX-500(L) series are high efficiency switching regulators and ideal substitutes of LM78XX series three-terminal linear regulators. The product is featured with ultra-wide input voltage range, high efficiency, low loss, low radiation and no heat sink requirement.

MODEL SELECTION

K78U05-500



MORNSUN Science & Technology Co.,Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China

Tel:86-20-38601850

Fax:86-20-38601272

E-mail:info@mornsun.cn

www.mornsun-power.com

Selection Guide

Part Number	Input Voltage(VDC)		Output			Efficiency%(typ.)	
	Nominal	Range	Voltage (VDC)	Current(mA) Min. Max.	Vin (Min.)	Vin (Max.)	
K78U03-500(L)	48	9.0~72.0	3.3	10 500	82	75	
K78U05-500(L)		9.0~72.0	5.0	10 500	87	81	
K78UX6-500(L)		9.0~72.0	6.5	10 500	91	84	
K78U09-500(L)		14.0~72.0	9.0	10 500	92	86	
K78U12-500(L)		17.0~72.0	12.0	10 500	93	89	
K78U15-500(L)		20.0~72.0	15.0	10 500	94	90	
K78U24-300(L)		36.0~72.0	24.0	6 300	95	91	

Note: Add suffix "L" for 90° bend pins, for example: K78U05-500L.

Output Specifications

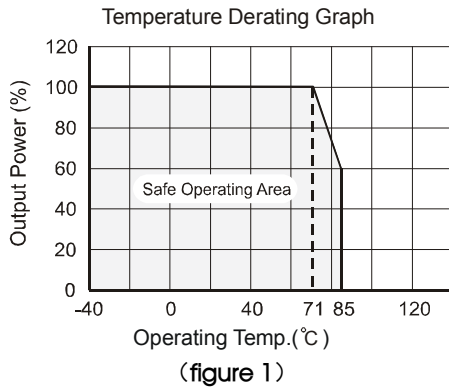
Item	Test conditions	Min.	Typ.	Max.	Units
Voltage Accuracy	100% load	--	±2	±3	
Linear Regulation	Input voltage variation from low to high at full load	--	±0.4	±1.0	%
Load Regulation*	From 10% to 100% Load	--	±0.3	±0.6	
Ripple & Noise	20MHz bandwidth, from 10% to 100% Load (refer to figure 2)	--	20	60	mVp-p
Short-circuit Input Power Consumption	Vin=Nominal	--	0.72	1.2	W
Short-circuit Protection		Continuous, self-recovery			
Over-temperature Protection		--	160	--	°C
Switching Frequency	100% full load	120	--	800	kHz
Output Current Limit	Vin=Nominal	--	700	1200	mA
Static Current	Vin=Nominal, Min. Load	--	1	5	
Temperature Coefficient		--	--	±0.015	%/°C
Dynamic Load	From 10% to 100% Load	--	--	±100	mV
Capacitive Load (µF) Max.		--	1.0	1.5	ms
		--	--	100	µF

Note: Pin of GND could not be left open, otherwise the module will be damaged.

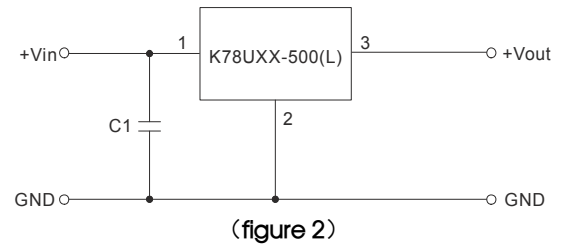
General Specifications

Item	Test conditions	Min.	Typ.	Max.	Units
Storage humidity		--	--	95	%
Operating Temperature	Derating when operating temperature up to 71°C	-40	--	85	
Operating Case Temperature		--	65	100	°C
Storage Temperature		-55	--	125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
Cooling Method		Free air convection			
Case Material		plastic; flame-retardant and heat-resistant (UL94-V0)			
MTBF	MIL-HDBK-217F@25°C	3500	--	--	k hours
	MIL-HDBK-217F@71°C	1500	--	--	
Hot Plug		Unavailable			
Thermal Impedance		--	--	60	°C/W
CE	Refer to figure 5	EN55032, CLASS B			
RE					
ESD		IEC/EN 61000-4-2 level 4			
Safety Certification		EN-60950-1			
Weight		--	4.0	--	g

Typical Characteristic Curves



Design Reference

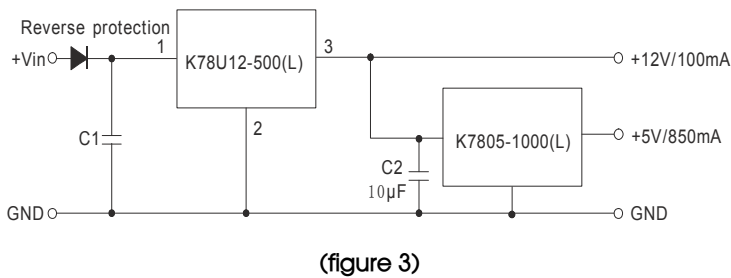


Note:

1. The regulator proposed to establish the input voltage by soft-start, hot plug is not available, if the input voltage changes from low to high abruptly, the regulator might be damaged.
2. If the application in high-voltage, the regulator must add an external capacitor C1($\leq 47 \mu\text{F}/100\text{V}$) to prevent voltage spikes damage to the module.
3. The products do not support parallel connection of their output.

Design Reference

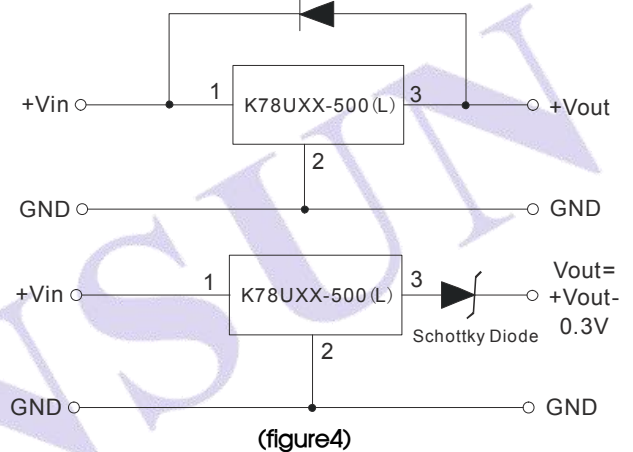
High voltage input, multiple outputs with greater load



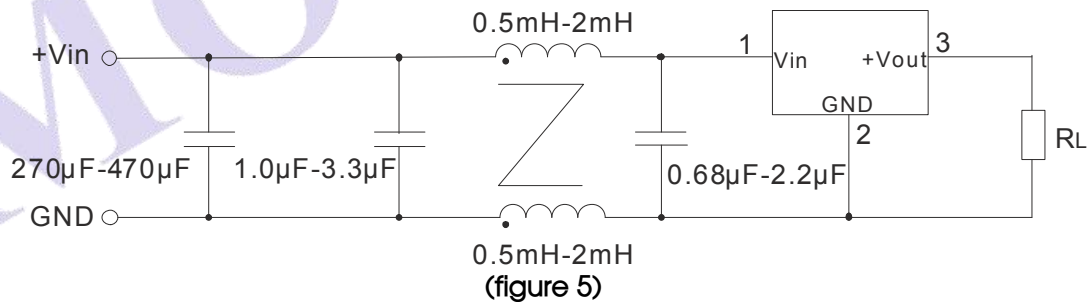
Note:

1. The sum of the total input current of the post-stage regulator and the load current of the pre-stage regulator should be less than or equal to the maximum load current of the pre-stage regulator.
2. For further filtering, please add capacitors according to the above figure (this series is not recommended), if needed, please make sure $C1 \leq 47 \mu\text{F}$, $C2 \leq 10 \mu\text{F}$ and make them as close as possible to the post-stage regulator.

Modules Protection Recommended Circuit

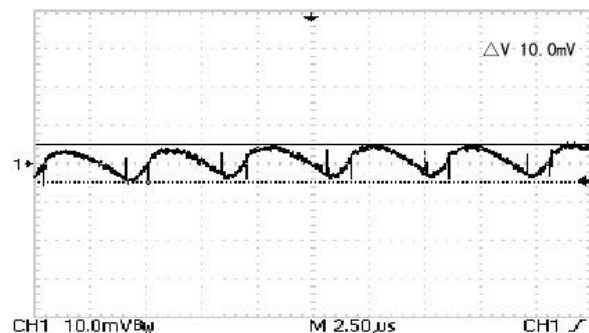


EMC compliance circuit

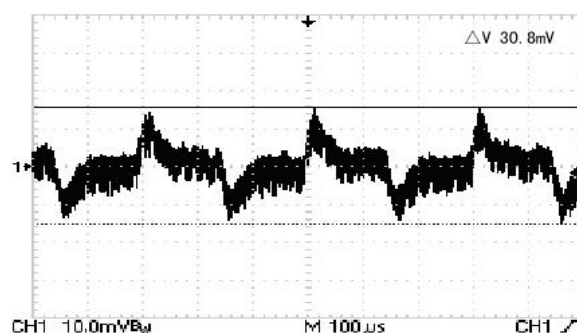


Test Configurations (TA=25° C)

1、 FULL LOAD OUTPUT RIPPLE & NOISE MEASURED GRAPH



2、 LOAD TRANSIENT RESPONSE WAVEFORM

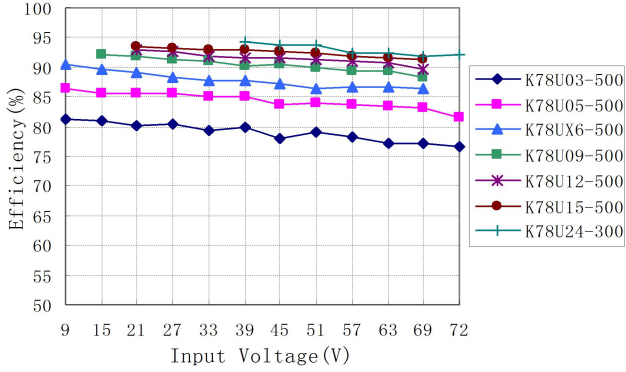


Typical Characteristics Curves

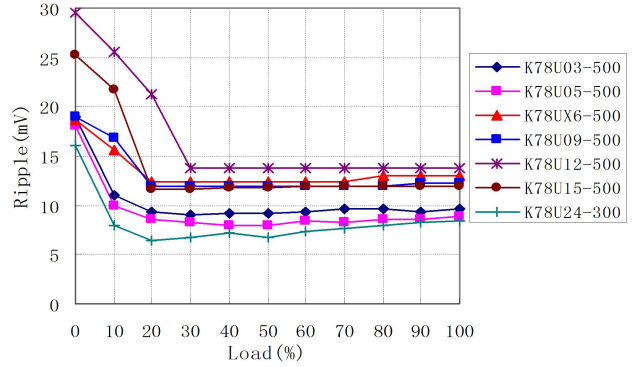
Efficiency

Ripple

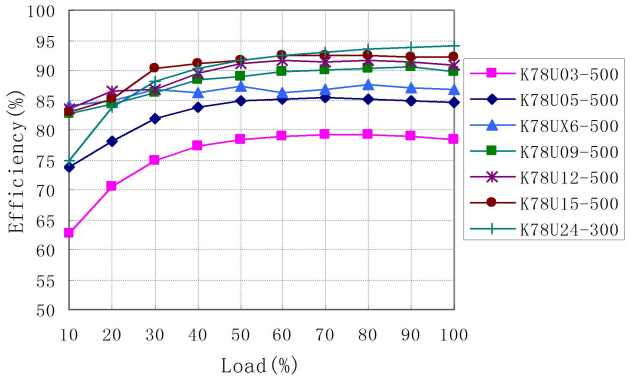
Efficiency VS Input Voltage curve (full load)



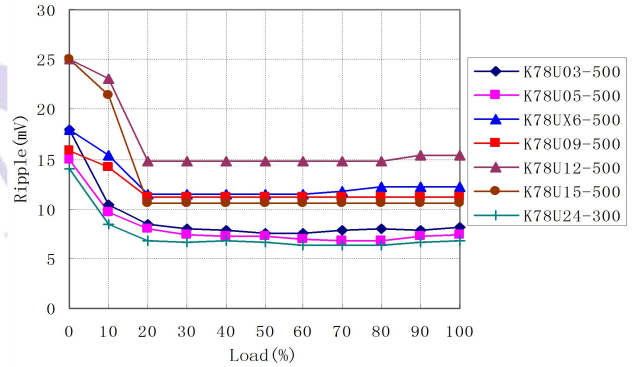
Ripple VS Load curve (Vin=Vmax)



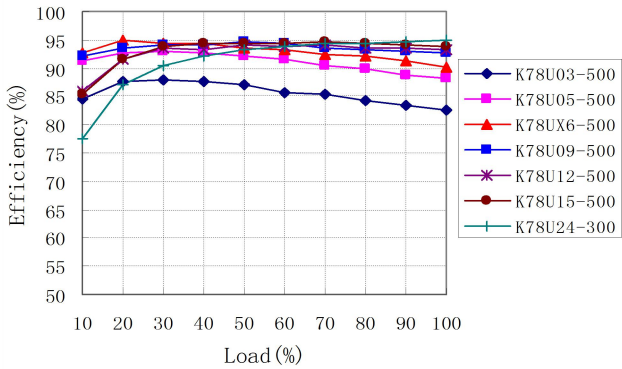
Efficiency VS Load curve (Vin=Vin-nominal)



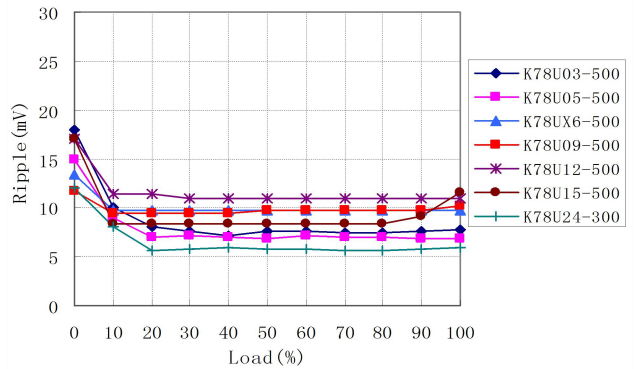
Ripple VS Load curve (Vin=Vin-nominal)



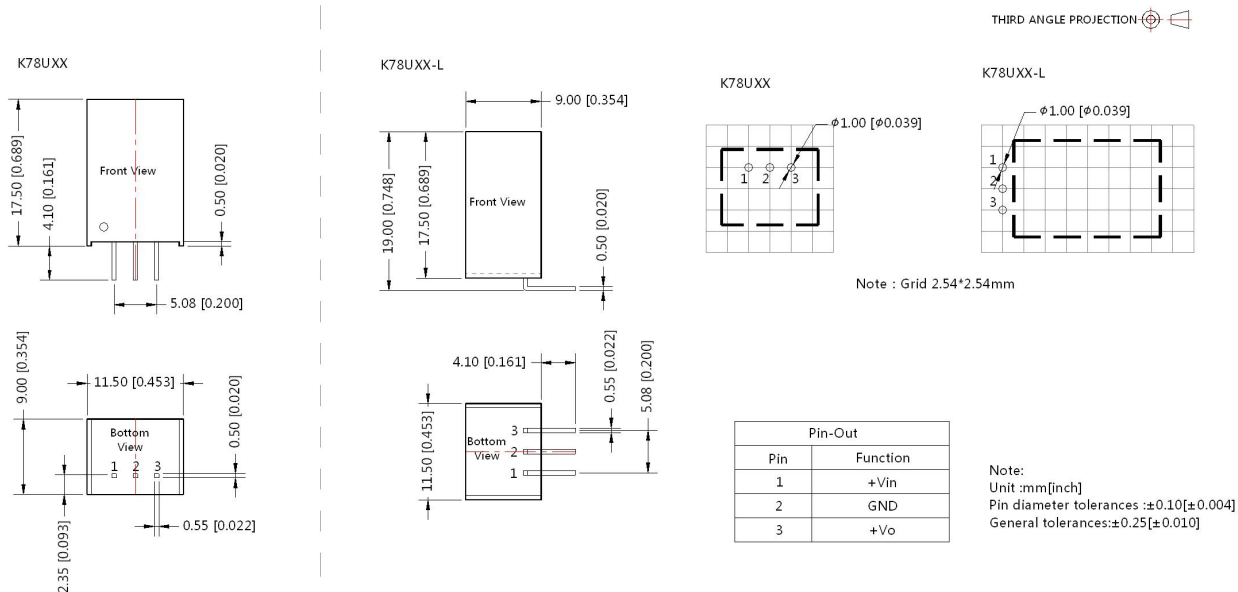
Efficiency VS Load curve (Vin=Vmin)



Ripple VS Load curve (Vin=Vmin)



Outline Dimensions & Footprint Details



Note:

1. We suggested to use module at load of over 10%, and the external capacitor for output should not be too large (recommend $< 10 \mu F$), otherwise ripple will increase dramatically;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet, but does not damage the product;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a = 25^\circ C$, humidity $< 75\% RH$ with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. Products are related to laws and regulations: see "Features" and "General Specifications";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.