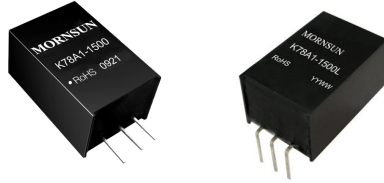


# MORNSUN®

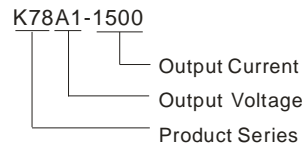
## K78A1-1500(L) SERIES

**WIDE INPUT NON-ISOLATED & REGULATED  
SINGLE OUTPUT**



RoHS

### PART NUMBER SYSTEM



### FEATURES

- Efficiency up to 78%
- Operating Temperature range: -40°C ~ +85°C
- Pin-out compatible with LM78XX linears
- Short circuit protection, thermal shutdown
- Low ripple and noise
- Sip package, meet UL94-V0
- Low Temperature rise
- Industry standard pinout

### APPLICATIONS

K78A1-1500(L) series high efficiency switching regulators are ideally suited to replace 78xx linear regulators and are pin compatible.

### SELECTION GUIDE

Part Number	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)	Efficiency (% max)	
	Nominal	Range			Vin(Min)	Vin (Max)
K78A1-1500(L)	12	4.75-14	1.2	1500	78	75

Note: Add suffix "L" for 90° bend pins, for example: K78A1-1500L.

### INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
No-load Input Power	Input Voltage Range	--	0.096	0.112	W
Reverse Polarity Input		Forbidden			
Input Filter		Capacitance Filter (4.7μF)			

### OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage accuracy	100% load, input voltage range	--	±2	±3	%
Line Regulation	Input voltage range	--	±0.5	±1.0	
Load Regulation	From 10% to 100% full load	--	±0.5	±1.0	
Dynamic Load Stability	10%↔100% load	--	--	±350	mV
Switching Frequency	100% load, input Voltage Range	300	340	380	KHz
Output Current Limit		--	5000	--	mA
Static Current	Vin=min to max at 0% Load		5	8	
Temperature Drift	-40°C ~ +85 °C	--	--	±0.02	%/°C
Ripple & Noise*	20MHz bandwidth (refer to figure 2)	--	25	35	mVp-p
Over Temperature Protection	IC inside	--	150	--	°C
Short circuit protection		Continuous, automatic recovery			
Max. Capacitive Load		--	--	1000	μF

Note:\* Ripple and noise tested by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

### COMMON SPECIFICATIONS

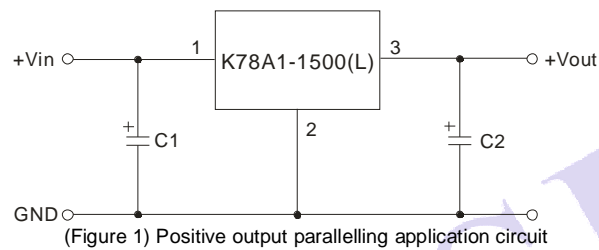
Item	Test Conditions	Min.	Typ.	Max.	Unit
MTBF	MIL-HDBK-217F @25°C	2000	--	--	K hours

Case material		Plastic (UL94-V0)			
Weight		--	4.0	--	g

## ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 71°C)	-40	--	85	°C
Storage Temperature		-55	--	125	
The Max. Case Temperature	Operating temperature curve range	--	--	100	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

## TYPICAL APPLICATION CIRCUIT



## EXTERNAL CAPACITOR TABLE

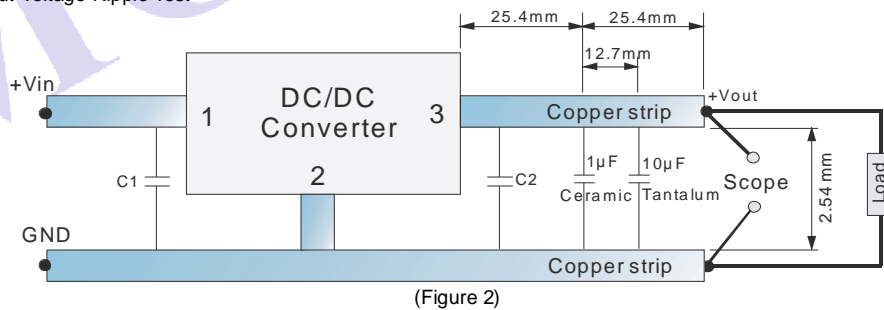
Part Number	C1 (Ceramic Capacitor)	C2 (Ceramic Capacitor)
K78A1-1500(L)	10 $\mu$ F/25V	22 $\mu$ F/6.3V

Note:

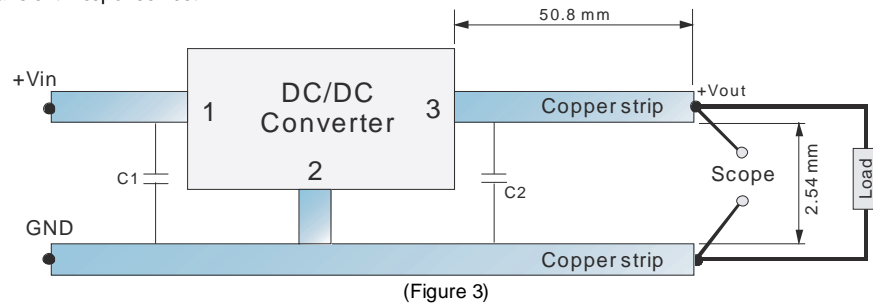
- In order to the circuit work in the best status, C1 and C2 must be added in the circuit, and they should be placed as near as the products' footprints.
- The capacitance of C1,C2 sees external capacitor table, it can be increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
- Cannot use in parallel and hot swap.

## TEST CONFIGURATIONS (TA=25°C)

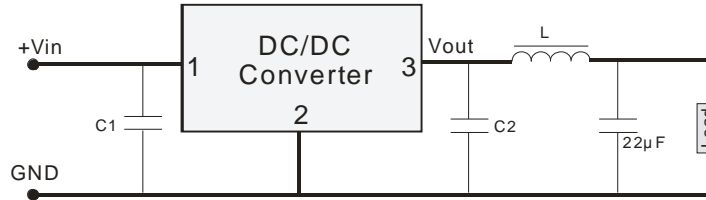
### 1. Efficiency and Output Voltage Ripple Test



### 2. Start-up and Load Transient Response Test

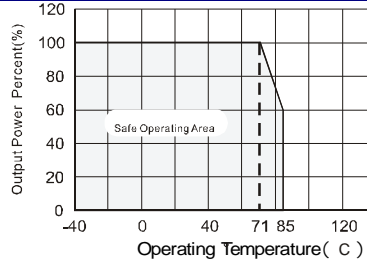


## OUTPUT RIPPLE REDUCTION

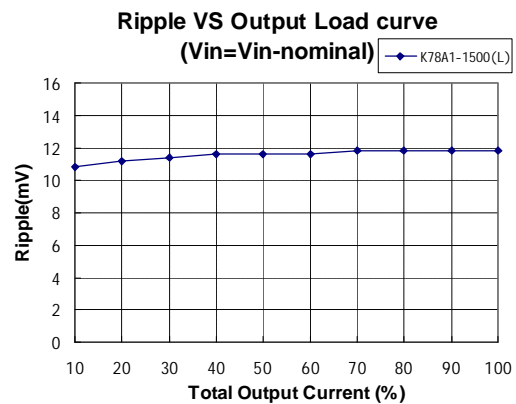
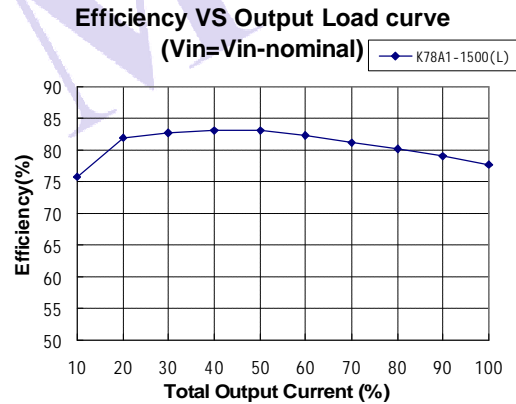
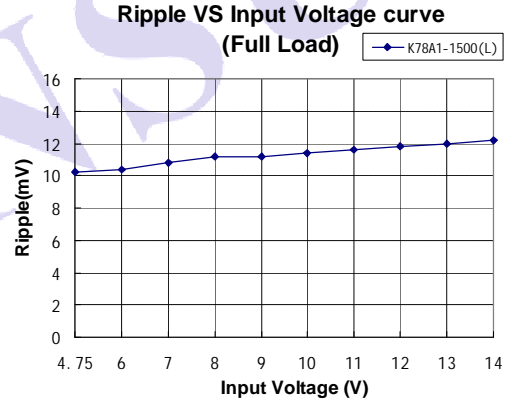
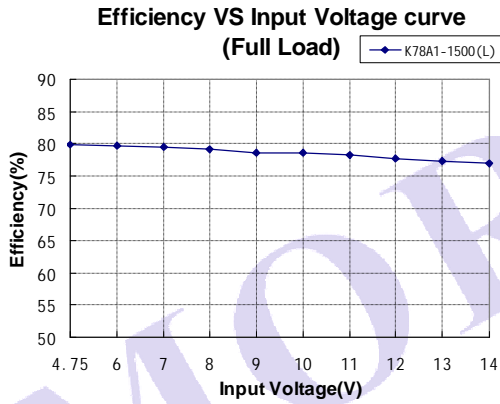


To reduce output ripple, it is recommended to add a LC filter in output port.  
 L: Recommended parameter  $10\mu\text{H} \sim 47\mu\text{H}$ .  
 (Figure 4)

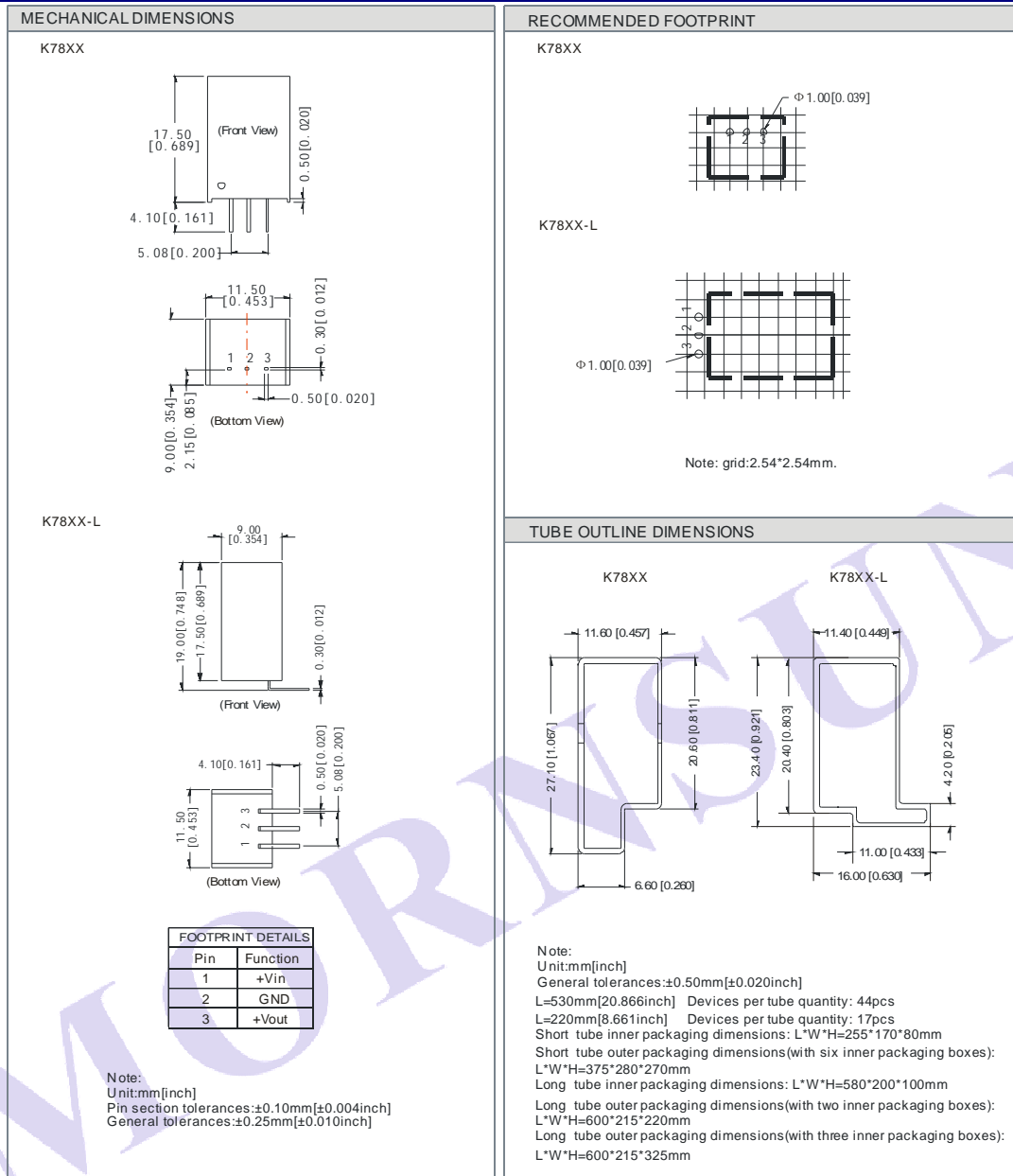
## TYPICAL DERATING CURVE



## TYPICAL CHARACTER CURVE



## OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING



Note:

1. Max. Capacitive Load tested at input voltage range and full load.
2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on our corporate standards.
4. All characteristics are for listed model, non-standard models may perform differently, please contact our technical person for more detail.
5. Contact us for your specific requirement.
6. Specifications subject to change without prior notice.

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