



multi-country patent protection **RoHS**

## K78XX-500 Series

**WIDE INPUT NON-ISOLATED & REGULATED  
SINGLE POSITIVE/NEGATIVE OUTPUT**

### FEATURES

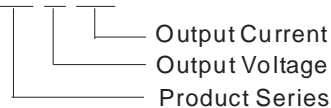
- Efficiency Up To 96%
- Temperature Range: -40°C to +85°C
- No heat sink Required
- Pin-out compatible with LM78XX Linears
- Short circuit protection, Thermal Shutdown
- Low ripple and noise
- SIP Package
- Industry Standard Pinout
- MTBF>2,000,000 hours
- The K78xx-500 Series converters can also be used to convert a positive voltage into a negative voltage.
- Only two extra capacitors are required.
- Input voltage range can be lower than the output voltage for higher output voltages

### APPLICATIONS

The K78xx-500 Series high efficiency switching regulators are ideally suited to replace 78xx linear regulators and are pin compatible.

### MODEL SELECTION

K7805-500



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### PRODUCT PROGRAM

| Part Number | Input               | Output        |              | Efficiency(%) |           |
|-------------|---------------------|---------------|--------------|---------------|-----------|
|             | Voltage Range (VDC) | Voltage (VDC) | Current (mA) | Vin (Min)     | Vin (Max) |
| K7803-500   | 4.75-28             | 3.3           | 500          | 90            | 80        |
|             | 4.75-25             | -3.3          | -400         | 73            | 78        |
| K7805-500   | 6.5-32              | 5.0           | 500          | 93            | 84        |
|             | 6.0-27              | -5.0          | -400         | 78            | 83        |
| K78X6-500   | 8-32                | 6.5           | 500          | 94            | 87        |
|             | 6.0-25              | -6.5          | -300         | 83            | 85        |
| K7809-500   | 11-32               | 9.0           | 500          | 95            | 91        |
|             | 7.0-23              | -9.0          | -200         | 87            | 86        |
| K7812-500   | 15-32               | 12            | 500          | 95            | 92        |
|             | 7.0-20              | -12           | -200         | 85            | 87        |
| K7815-500   | 18-32               | 15            | 500          | 96            | 93        |
|             | 7.0-17              | -15           | -200         | 84            | 89        |

### OUTPUT SPECIFICATIONS

| Item                      | Test Conditions                | Min                            | Typ  | Max  | Units |
|---------------------------|--------------------------------|--------------------------------|------|------|-------|
| Output Voltage accuracy   | 100% full load                 |                                | ±2   | ±3   | %     |
| Line regulation           | Vin= min. to max. at full load |                                | ±0.2 | ±0.4 |       |
| Load regulation           | 10% to 100% load               |                                | ±0.4 | ±0.6 |       |
| Ripple+Noise*             | 20MHZ Bandwidth                |                                | 20   | 35   | mVp-p |
| Short Circuit Input Power |                                |                                | 0.5  | 1.8  | W     |
| Short circuit protection  |                                | Continuous, automatic recovery |      |      |       |
| Switching frequency       |                                | 280                            | 330  | 450  | KHz   |
| Quiescent current         | Positive Output                |                                | 5    | 8    | mA    |
|                           | Negative Output                |                                | 7    | 13   |       |
| Thermal Shutdown          | Internal IC junction           |                                | 150  |      | °C    |
| Temperature coefficient   | -40 °C to +85 °C ambient       |                                |      | 0.02 | %/°C  |
| Max capacitance load      |                                |                                |      | 1000 | µF    |

\*Test ripple and noise by "parallel cable" method.

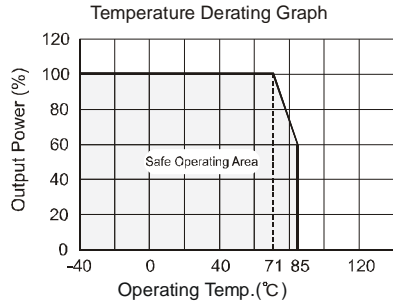
### COMMON SPECIFICATION

| Item                   | Test Conditions                | Min                 | Typ | Max | Units   |
|------------------------|--------------------------------|---------------------|-----|-----|---------|
| Operating Temp. Range  |                                | -40                 |     | 85  | °C      |
| Operating Case Temp.   |                                |                     |     | 100 |         |
| Storage Temp. Range    |                                | -55                 |     | 125 |         |
| Cooling                |                                | Free Air Convection |     |     |         |
| Case Material          |                                | Plastic (UL94-V0)   |     |     |         |
| Lead Temperature       | 1.5mm from case for 10 seconds |                     |     | 300 | °C      |
| Storage Humidity Range |                                |                     |     | 95  | %       |
| MTBF                   | +25 °C, MIL-HDBK-217F          | 2000                |     |     | K hours |
| Package Weight         |                                |                     | 2.0 |     | g       |

Note:

1. All specifications measured at T<sub>A</sub>=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. Only typical models listed. If you need other model, please confirm the power, input voltage and output voltage, then phone us.

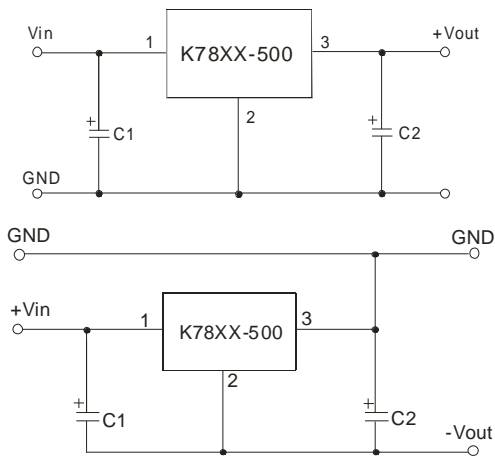
## TYPICAL CHARACTERISTICS



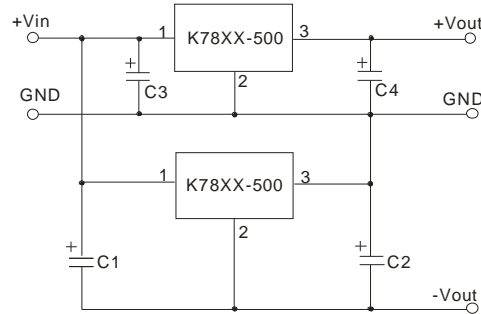
## EXTERNAL CAPACITOR TABLE

| Part Number | C1,C3<br>(ceramic capacitor) | C2,C4<br>(ceramic capacitor) |
|-------------|------------------------------|------------------------------|
| K7803-500   | 10uF/50V                     | 22uF/6.3V                    |
| K7805-500   | 10uF/50V                     | 22uF/10V                     |
| K78X6-500   | 10uF/50V                     | 10uF/10V                     |
| K7809-500   | 10uF/50V                     | 10uF/16V                     |
| K7812-500   | 10uF/50V                     | 10uF/25V                     |
| K7815-500   | 10uF/50V                     | 10uF/25V                     |

## STANDARD APPLICATION CIRCUIT



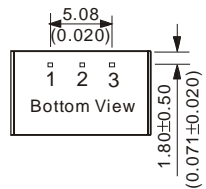
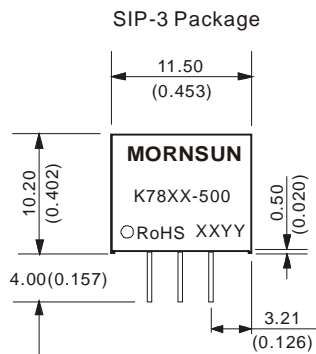
## APPLICATION EXAMPLE



Note:

1. C1 and C2 are required and should be fitted close to the converter pins.
2. The capacitance of C1, C2, C3 and C4 sees external capacitor table, it can be increase properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
3. No parallel connection or plug and play.

## PACKAGE STYLE AND PINNING

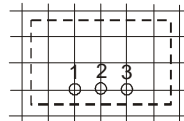


Note:  
Unit:mm (inch)  
Pin section:0.50\*0.30mm(0.020\*0.012inch)  
Pin section tolerances: ±0.10mm(±0.004inch)  
General tolerances:±0.25mm(±0.010inch)

First Angle Projection



RECOMMENDED FOOTPRINT  
Top view,grid:2.54mm(0.1inch),  
diameter:1.00mm(0.039inch)

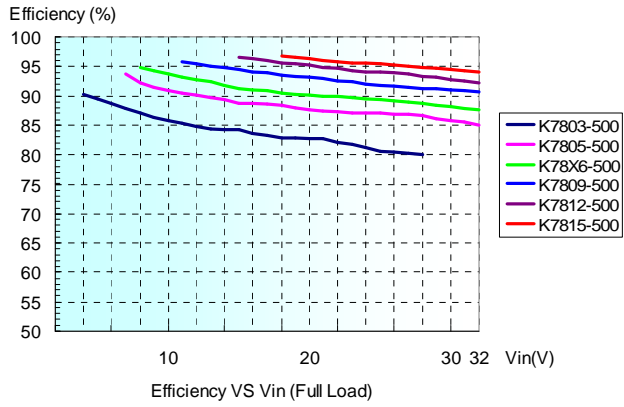


FOOTPRINT DETAILS

| Pin | Positive | Negative |
|-----|----------|----------|
| 1   | +Vin     | +Vin     |
| 2   | GND      | -Vout    |
| 3   | +Vout    | GND      |

# CHARACTERISTICS(POSITIVE OUTPUT)

## Efficiency



## Ripple

