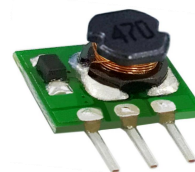


### FEATURES

1. Economical open frame power supply
2. High efficiency up to 95%
3. Operating ambient temperature range: -40°C to +85°C
4. No-load input current as low as 0.2mA
5. Support the negative output
6. Output short-circuit protection



3 years  
Warranty

### Selection Guide

| Part No.       | Input Voltage (VDC)* | Output        |              | Full Load Efficiency (%) Typ. Vin Min. / Vin Max. | Capacitive Load (μF) Max. |
|----------------|----------------------|---------------|--------------|---------------------------------------------------|---------------------------|
|                | Nominal (Range)      | Voltage (VDC) | Current (mA) |                                                   |                           |
| K7803-500R3-LB | 24<br>(4.75-36)      | 3.3           | 500          | 85/76                                             | 680                       |
|                | 12<br>(7-32)         | -3.3          | -300         | 73/72                                             | 330                       |
| K7805-500R3-LB | 24<br>(6.5-36)       | 5             | 500          | 90/81                                             | 680                       |
|                | 12<br>(7-31)         | -5            | -300         | 76/78                                             | 330                       |
| K78X6-500R3-LB | 24<br>(8-36)         | 6.5           | 500          | 91/83                                             | 680                       |
|                | 12<br>(7-29)         | -6.5          | -300         | 76/77                                             | 330                       |
| K7809-500R3-LB | 24<br>(12-36)        | 9             | 500          | 93/87                                             | 680                       |
|                | 12<br>(8-27)         | -9            | -150         | 83/77                                             | 330                       |
| K7812-500R3-LB | 24<br>(15-36)        | 12            | 500          | 94/88                                             | 680                       |
|                | 12<br>(8-24)         | -12           | -150         | 85/82                                             | 330                       |
| K7815-500R3-LB | 24<br>(19-36)        | 15            | 500          | 95/90                                             | 680                       |
|                | 12<br>(8-21)         | -15           | -150         | 80/79                                             | 330                       |

Note: \* For input voltages exceeding 30 VDC, an input capacitor of 22μF/50V is required.

### Input Specifications

| Item                      | Operating Conditions  |                 | Min.                  | Typ. | Max. | Unit |
|---------------------------|-----------------------|-----------------|-----------------------|------|------|------|
| No-load Input Current     | Nominal input voltage | Positive output | –                     | 0.2  | 1.5  | mA   |
|                           |                       | Negative output | –                     | 1    | 10   |      |
| Reverse Polarity at Input |                       |                 | Avoid / Not protected |      |      |      |
| Input Filter              |                       |                 | Capacitance filter    |      |      |      |

## Output Specifications

| Item                                                                                                                                                                                                                                 | Operating Conditions                                   |                | Min.                      | Typ.  | Max. | Unit  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------|---------------------------|-------|------|-------|
| Voltage Accuracy                                                                                                                                                                                                                     | Full load, input voltage range                         | K7803-500R3-LB | --                        | ±2    | ±4   | %     |
| Voltage Accuracy                                                                                                                                                                                                                     | Full load, input voltage range                         | Others         | --                        | ±2    | ±3   |       |
| Linear Regulation                                                                                                                                                                                                                    | Full load, input voltage range                         |                | --                        | ±0.2  | ±0.5 |       |
| Load Regulation                                                                                                                                                                                                                      | Nominal input voltage, 10% -100% load                  |                | --                        | ±0.3  | ±1   |       |
| Ripple & Noise*                                                                                                                                                                                                                      | 20MHz bandwidth, nominal input voltage, 20% -100% load |                | --                        | 50    | 100  | mVp-p |
| Temperature Coefficient                                                                                                                                                                                                              | Operating ambient temperature -40°C to +85°C           |                | --                        | ±0.02 | —    | %/°C  |
| Transient Response Deviation                                                                                                                                                                                                         | Nominal input voltage, 25% load step change            |                | --                        | ±50   | ±250 | mV    |
| Transient Recovery Time                                                                                                                                                                                                              |                                                        |                | --                        | 0.2   | 1    | ms    |
| Short-circuit Protection                                                                                                                                                                                                             | Nominal input voltage                                  |                | Continuous, self-recovery |       |      |       |
| Notes: * 1.The “parallel cable” method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information; 2.With light loads at or below 20%, Ripple & Noise increases to 300mVp-p max., |                                                        |                |                           |       |      |       |

## General Specifications

| Item                                 | Operating Conditions             | Min. | Typ. | Max. | Unit    |
|--------------------------------------|----------------------------------|------|------|------|---------|
| Operating Temperature                | See Fig. 1                       | -40  | —    | +85  | °C      |
| Storage Temperature                  |                                  | -55  | —    | +125 |         |
| Pin Soldering Resistance Temperature | Soldering time: 10 seconds       | —    | —    | +260 |         |
| Storage Humidity                     | Non-condensing                   | 5    | —    | 95   | %RH     |
| Switching Frequency                  | Full load, nominal input voltage | —    | 700  | —    | kHz     |
| MTBF                                 | MIL-HDBK-217F@25°C               | 2000 | —    | —    | k hours |

## Mechanical Specifications

|                       |                        |
|-----------------------|------------------------|
| <b>Dimensions</b>     | 10.27 x 6.00 x 8.61 mm |
| <b>Weight</b>         | 0.6g (Typ.)            |
| <b>Cooling Method</b> | Free air convection    |

## EMC Specifications

|                  |       |                  |                                                          |                  |
|------------------|-------|------------------|----------------------------------------------------------|------------------|
| <b>Emissions</b> | CE    | CISPR32/EN55032  | CLASS B (see Fig. 5-② for recommended circuit)           |                  |
|                  | RE    | CISPR32/EN55032  | CLASS B (see Fig. 5-② for recommended circuit)           |                  |
| <b>Immunity</b>  | ESD   | IEC/EN 61000-4-2 | Contact ±4kV                                             | perf. Criteria B |
|                  | RS    | IEC/EN 61000-4-3 | 10V/m                                                    | perf. Criteria A |
|                  | EFT   | IEC/EN 61000-4-4 | ±1kV (see Fig. 5-① for recommended circuit)              | perf. Criteria B |
|                  | Surge | IEC/EN 61000-4-5 | line to line ±1kV (see Fig. 5-① for recommended circuit) | perf. Criteria B |
|                  | CS    | IEC/EN 61000-4-6 | 3Vr.m.s                                                  | perf. Criteria A |

## Typical Characteristic Curves

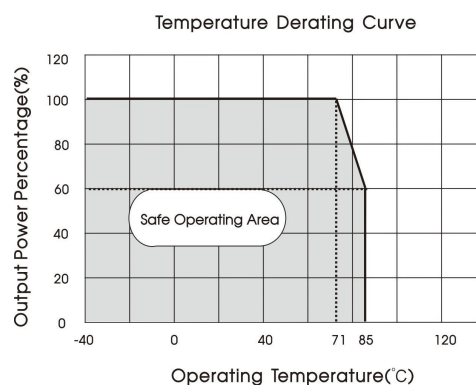
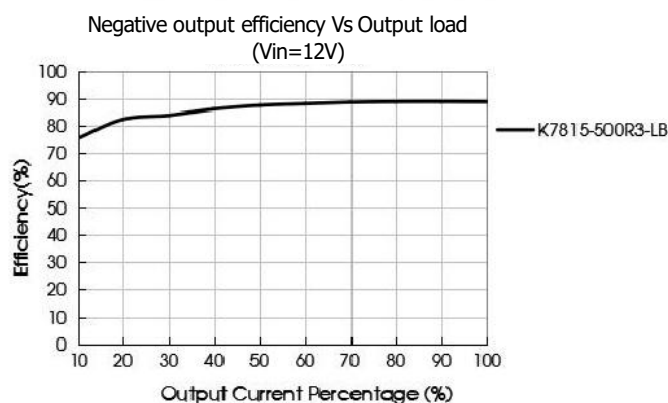
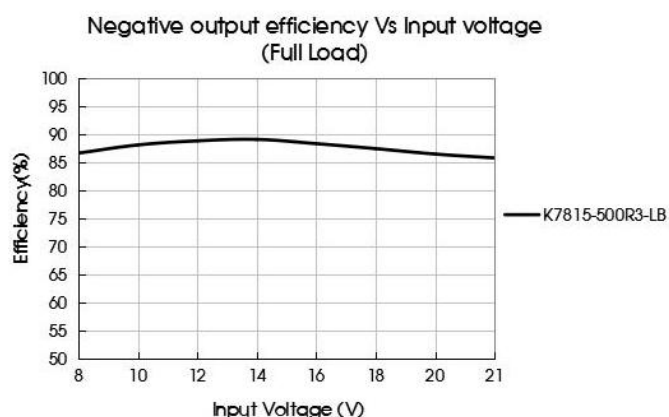
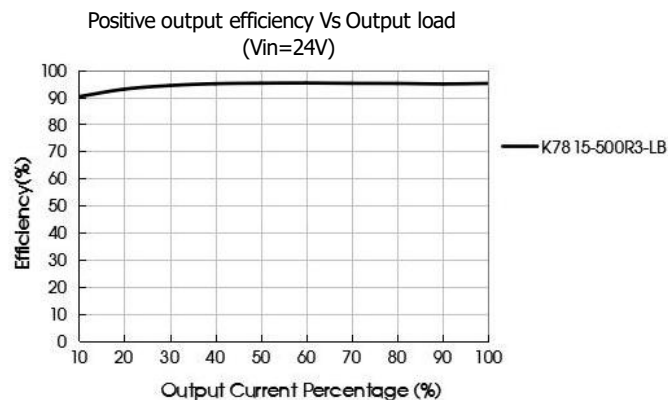
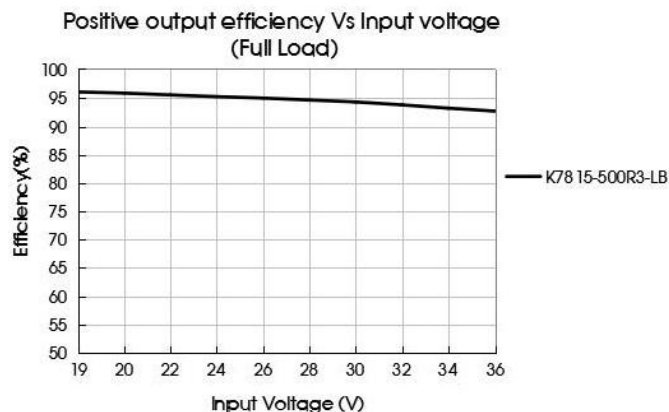


Fig. 1



## Design Reference

### 1. Typical application

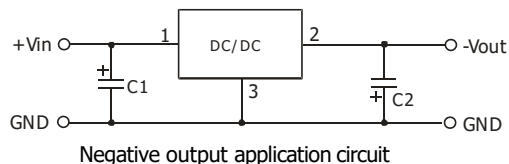
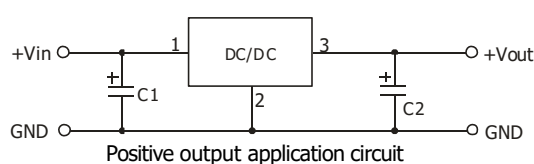
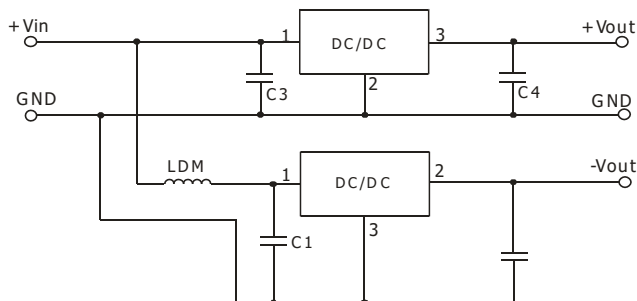


Fig. 2 Typical application circuit



#### Notes:

- The required capacitors C1 and C2 (C3 and C4) must be connected as close as possible to the terminals of the module;
- Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
- When using configurations as shown in figure 3, we recommended to add an inductor (LDM) with a value of up to 10μH which helps reducing mutual interference;
- Converter cannot be used for hot swap and with output in parallel;
- 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.

Table 1

| Part No.       | C1/C3<br>(ceramic capacitor) | C2/C4<br>(ceramic capacitor) |
|----------------|------------------------------|------------------------------|
| K7803-500R3-LB | 10μF/50V                     | 22μF/10V                     |
| K7805-500R3-LB |                              | 22μF/10V                     |
| K78X6-500R3-LB |                              | 22μF/16V                     |
| K7809-500R3-LB |                              | 22μF/16V                     |
| K7812-500R3-LB |                              | 22μF/25V                     |
| K7815-500R3-LB |                              | 22μF/25V                     |

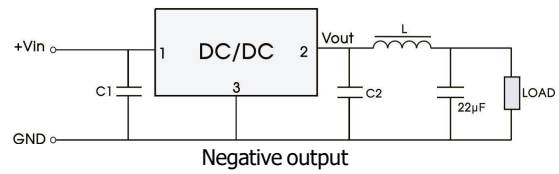
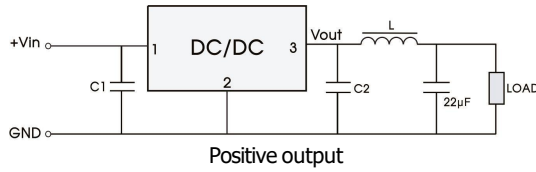


Fig. 4 "LC" output filter application

### 2. EMC compliance circuit

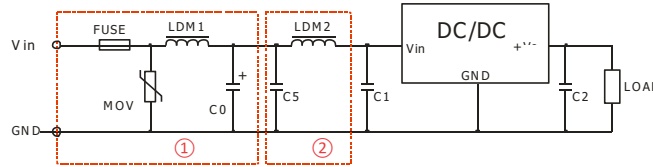


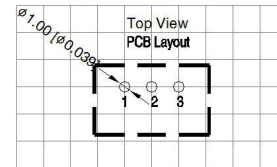
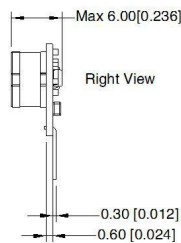
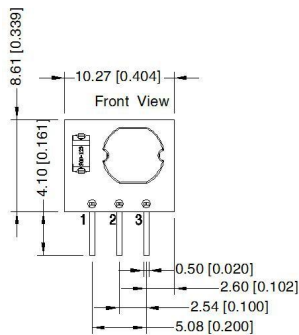
Fig. 5 EMC compliance circuit

| FUSE                                                | MOV    | LDM1 | C0         | C1/C2            | C5        | LDM2 |
|-----------------------------------------------------|--------|------|------------|------------------|-----------|------|
| Select fuse value according to actual input current | S20K30 | 82µH | 680µF /50V | Refer to table 1 | 10µF /50V | 22µH |

Notes: For EMC tests we use Part ① in Fig. 5 for immunity and part ② for emissions test. Selecting based on needs.

## Dimensions and Recommended Layout

THIRAD ANGLE PROJECTION



Note: Grid 2.54\*2.54mm

| Pin-Out |                 |                 |
|---------|-----------------|-----------------|
| Pin     | Positive Output | Negative Output |
| 1       | Vin             | Vin             |
| 2       | GND             | -Vout           |
| 3       | Vout            | GND             |

Note:  
Unit: mm[inch]  
Pin section tolerances:  $\pm 0.20 [\pm 0.008]$   
General tolerances:  $\pm 0.50 [\pm 0.020]$   
The layout of the device is for reference only,  
please refer to the actual product

- Note:
1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
  2. The maximum capacitive load is tested under the input voltage range and full load condition;
  3. Unless otherwise stated, all indexes in this manual are measured at  $T_a=25^\circ\text{C}$ , humidity  $<75\%\text{RH}$ , nominal input voltage and rated output load;
  4. All index testing methods in this manual are based on the enterprise standards of the company;
  5. Our company can provide product customization, specific needs can directly contact our technical staff;