



LMS78_0.5A Series

Wide Input Non-Isolated & Regulated, Single Positive/Negative Output

Switching Regulator

- ⊕ Efficiency up to 96%
- ⊕ Temperature range: -40°C ~ +85°C
- ⊕ No heat sink required
- ⊕ Pin-out compatible with LM78XX linears
- ⊕ Short circuit protection (SCP), Thermal shutdown
- ⊕ Low ripple and noise SIP package
- ⊕ Industry standard pinout
- ⊕ MTBF > 2,000,000 hours
- ⊕ The LMS78_0.5A 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

The LMS78_0.5A series high efficiency switching regulators are ideally suited to replace LM78xx linear regulators and are pin compatible.

Model selection:

LMS78_yy-pp
LM=Series; S=case; ##=Vout; pp=output current

Example:

LMS78_05-0.5
LM=Series; S=SIP Case; ##= 5Vout; pp=0.5A



RoHS

| Common specifications | |
|--------------------------------|---|
| Temperature rise at full load: | 25°C MAX, 15°C TYP |
| Cooling: | Free air convection |
| Operation temperature range: | -40°C~+85°C |
| Storage temperature range: | -55°C ~+125°C |
| Lead temperature: | 300°C MAX, 1.5mm from case for 10 sec |
| Operating case temperature: | 100°C |
| Storage humidity range: | < 95% |
| Package material: | Plastic [UL94-V0] |
| MTBF: | >2,000,000 hours +25°C MIL-HDBK-217F |
| Weight: | 2g |

Note:

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

| Output specifications | | | | | | |
|---------------------------|--------------------------------|--------------------------------|------|------|-------|--|
| Item | Test conditions | Min | Typ | Max | Units | |
| Output voltage accuracy | 100% 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 | | 25 | 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 | mA | |
| Thermal shutdown | Internal IC junction | | 150 | | °C | |
| Temperature coefficient | -40 °C to +85 °C ambient | | | 0.02 | %/°C | |
| Max capacitance load | | | | 1000 | µF | |

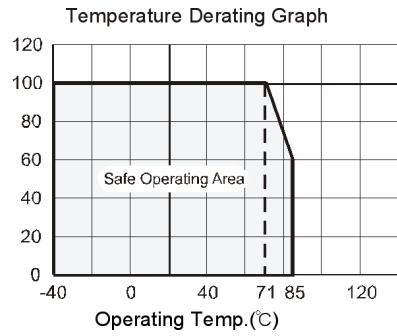
*Test ripple and noise by "parallel cable" method.

| Part Number | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [mA] | Efficiency [Vin. min] | Efficiency [Vin. max] | Package |
|---------------|---------------------------|----------------------|---------------------|-----------------------|-----------------------|---------|
| LMS78_03-0.5 | 4.75-28 | 3,3 | 500 | 90 | 80 | SIP3 |
| | 4.75-25 | -3,3 | -400 | 73 | 78 | |
| LMS78_05-0.5 | 6.5-32 | 5 | 500 | 93 | 84 | SIP3 |
| | 6.0-27 | -5 | -400 | 78 | 83 | |
| LMS78_6.5-0.5 | 8-32 | 6,5 | 500 | 94 | 87 | SIP3 |
| | 6,0-25 | -6,5 | -300 | 83 | 85 | |
| LMS78_09-0.5 | 11-32 | 9 | 500 | 95 | 91 | SIP3 |
| | 7.0-23 | -9 | -200 | 87 | 86 | |
| LMS78_12-0.5 | 15-32 | 12 | 500 | 95 | 92 | SIP3 |
| | 7.0-20 | -12 | -200 | 85 | 87 | |
| LMS78_15-0.5 | 18-32 | 15 | 500 | 96 | 93 | SIP3 |
| | 7.0-17 | -15 | -200 | 84 | 89 | |

LMS78_0.5A Series

Wide Input Non-Isolated & Regulated, Single Positive/Negative Output

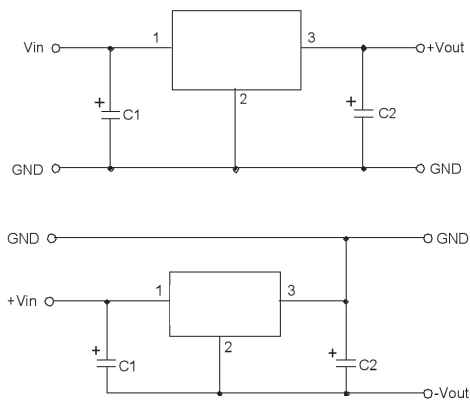
Typical characteristics



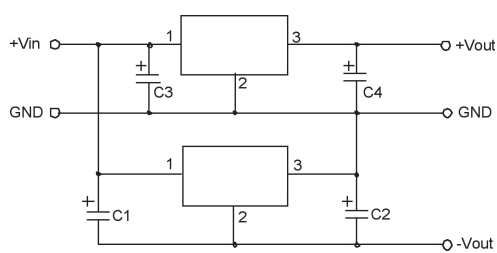
External capacitor table

| Part number | C1,C3 (Ceramic Capacitor) | C2,C4 (Ceramic Capacitor) |
|---------------|------------------------------|------------------------------|
| LMS78_03-0.5 | 10µF/50V | 22µF/6.3V |
| LMS78_05-0.5 | 10µF/50V | 22µF/10V |
| LMS78_6.5-0.5 | 10µF/50V | 10µF/10V |
| LMS78_09-0.5 | 10µF/50V | 10µF/16V |
| LMS78_12-0.5 | 10µF/50V | 10µF/25V |
| LMS78_15-0.5 | 10µF/50V | 10µF/25V |

Standard application circuit



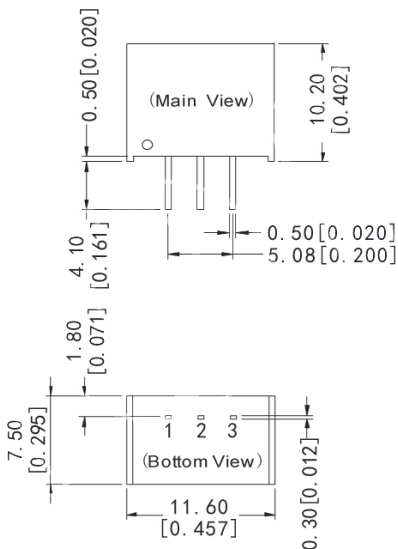
Application example



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 increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
3. No parallel connection or plug and play.

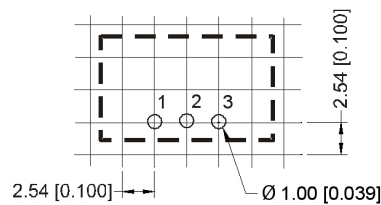
Mechanical dimension



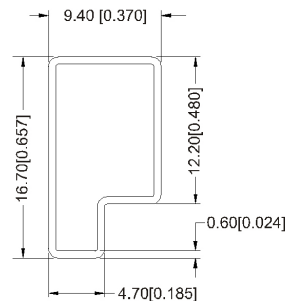
Note:
 Unit: mm[inch]
 Pin section tolerances: ± 0.10mm [± 0.004inch]
 General tolerances: ± 0.25mm [± 0.010inch]

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

Footprint details



Tube outline dimensions



Note:

Unit: mm[inch]
 General tolerances: 0.5mm [0.020inch]

L=530mm [20.866inch]
 Devices per tube quantity: 43pcs

L=220mm [8.661inch]
 Devices per tube quantity: 17pcs

LMS78_0.5A Series

Wide Input Non-Isolated & Regulated, Single Positive/Negative Output

Characteristics (positive output)

