



## LMP78\_1.0 series

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

### Switching Regulator (POL)

- ⊕ Internal Transient Voltage Suppression (TVS)
- ⊕ Low profile (L\*W\*H = 11.6\*6.0( 7.5)\*10.2)
- ⊕ Wide 4.5V to 42V operating input range
- ⊕ Compatible with LM78 pin-out
- ⊕ Short circuit protection (SCP)
- ⊕ Special outputs available from 1.2V to 15V
- ⊕ Low ripple/noise and efficiency up to 97%
- ⊕ Low quiescent current (no load) 200uA typ.

The LMP78\_1.0 series high efficiency switching regulators are ideally suited to replace LM78xx linear regulators and are pin compatible.



| Common specifications          |  |
|--------------------------------|--|
| Short circuit protection:      | Continuous, automatic recovery                                       |
| Temperature rise at full load: | 40°C MAX   |
| 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:    | 110°C MAX  |
| Case thermal impedance:        | 70°C/W   |
| Temperature coefficient:       | -40°C to +85°C ambient<br>0.02%/°C MAX                               |
| Storage humidity range:        | < 95%  |
| MTBF (using MIL-HDBK-217F):    | +25°C 2844x10 <sup>3</sup> hours<br>+71°C 2088x10 <sup>3</sup> hours |
| Packing quantities:            | 42pcs per Tube   |
| Case material:                 | Non Conductive Black Plastic UL94-V0                                 |
| Potting material:              | Epoxy UL94-V0  |
| Soldering profile:             | 265°C/10sec. MAX   |
| Weight:                        | 1.5g   |

| Output specifications        |                                |     |     |      |       |  |
|------------------------------|--------------------------------|-----|-----|------|-------|--|
| Item                         | Test conditions                | Min | Typ | Max  | Units |  |
| Output voltage accuracy      | Full load                      |     |     | ±2   | %     |  |
| Output current               |                                |     | 1.0 |      | A     |  |
| Output shorted current limit | Vout= 0VDC                     |     |     | 2.0  | A     |  |
| Internal power dissipation   |                                |     | 0.7 |      | W     |  |
| Line regulation              | Vin= min. to max. at full load |     |     | 0.4  | %     |  |
| Load regulation              | 0% to 100% load                |     |     | 0.6  | %     |  |
| Ripple + Noise               | 20MHz Bandwidth                |     | 30  | 60   | mVp-p |  |
| Dynamic load stability       | 100%-50% load                  |     |     | ±150 | mV    |  |
| Switching frequency          |                                |     |     | 600  | KHz   |  |
| Quiescent current            | Vin=min. to max. at 0% load    |     |     | 250  | uA    |  |
| Thermal shutdown             | Internal IC junction           |     | 150 |      | °C    |  |
| Max capacitance load         |                                |     |     | 470  | µF    |  |

#### Note:

1. All specifications measured at TA = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.

#### Example:

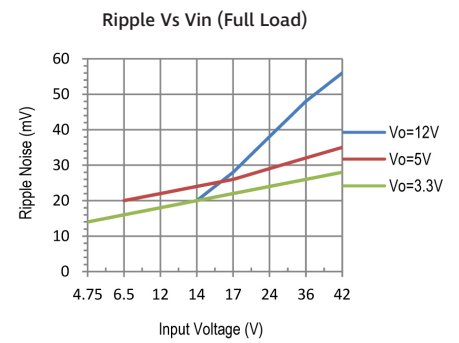
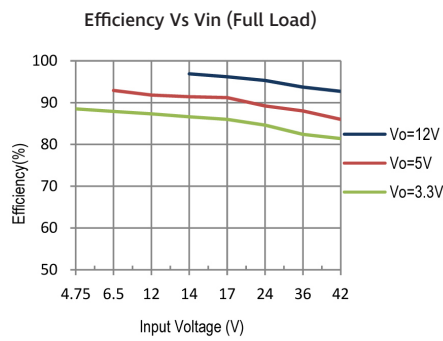
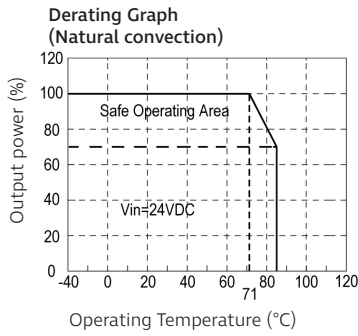
**LMP78\_05-1.0**  
LMP = Series; 05 = 5Vout; 1.0 = 1.0A

| Part Number    | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [A] | Efficiency [Vin. min] | Efficiency [Vin. max] | TVP limited [Vp-p] | Package |
|----------------|---------------------------|----------------------|--------------------|-----------------------|-----------------------|--------------------|---------|
| LMP78_1.2-1.0  | 4.5-42                    | 1.2                  | 1.0                | 72                    | 63                    | 55                 | SIP3    |
| LMP78_1.5-1.0  | 4.5-42                    | 1.5                  | 1.0                | 77                    | 68                    | 55                 | SIP3    |
| LMP78_1.8-1.0  | 4.5-42                    | 1.8                  | 1.0                | 80                    | 71                    | 55                 | SIP3    |
| LMP78_2.5-1.0  | 4.5-42                    | 2.5                  | 1.0                | 85                    | 77                    | 55                 | SIP3    |
| LMP78_03-1.0   | 4.75-42                   | 3.3                  | 1.0                | 88                    | 81                    | 55                 | SIP3    |
| LMP78_05-1.0   | 6.5-42                    | 5                    | 1.0                | 93                    | 86                    | 55                 | SIP3    |
| LMP78_6.5-1.0R | 8-42                      | 6.5                  | 1.0                | 93                    | 88                    | 55                 | SIP3    |
| LMP78_09-1.0R  | 11-42                     | 9                    | 1.0                | 95                    | 91                    | 55                 | SIP3    |
| LMP78_12-1.0R  | 14-42                     | 12                   | 1.0                | 97                    | 93                    | 55                 | SIP3    |
| LMP78_15-1.0R  | 17-42                     | 15                   | 1.0                | 97                    | 93                    | 55                 | SIP3    |

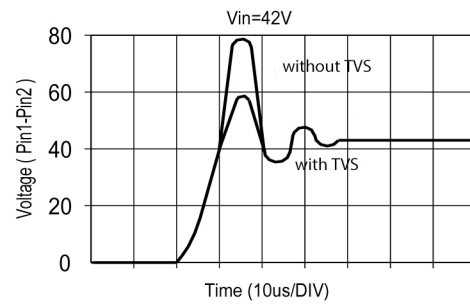
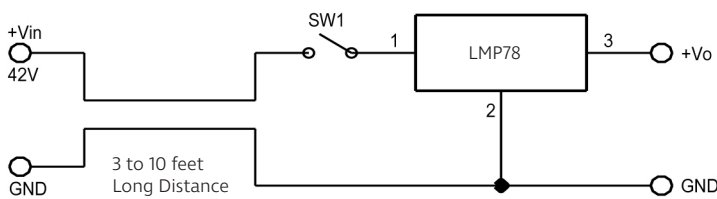
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## Typical characteristics

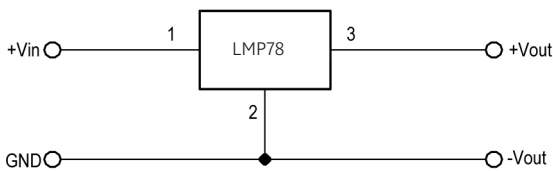


Internal Transient Voltage Suppression and waveform (No External Components Required)

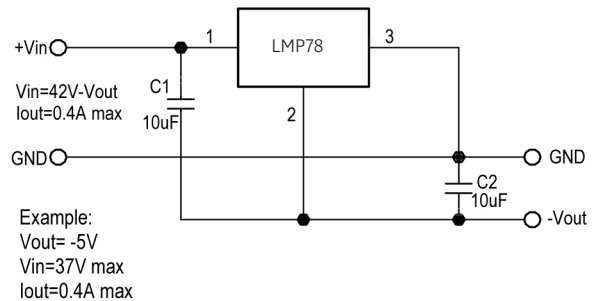


## Standard application circuit

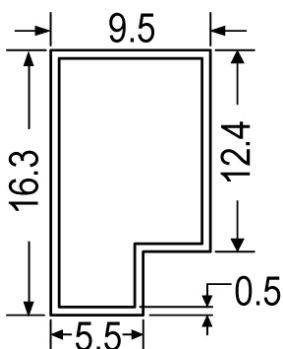
General Application



Negative Output Application (1.2V-15V Modes)



## Tube outline dimensions



Tolerance:  
XX.X ± 0.5 mm

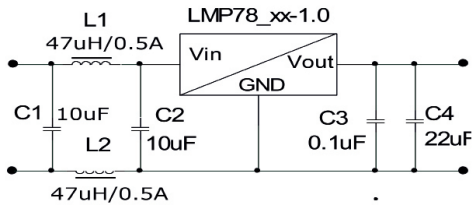
Note:  
L=520 ± 2 mm  
Devices per tube quantity: 42 PCS

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### EMC solution-recommended circuit

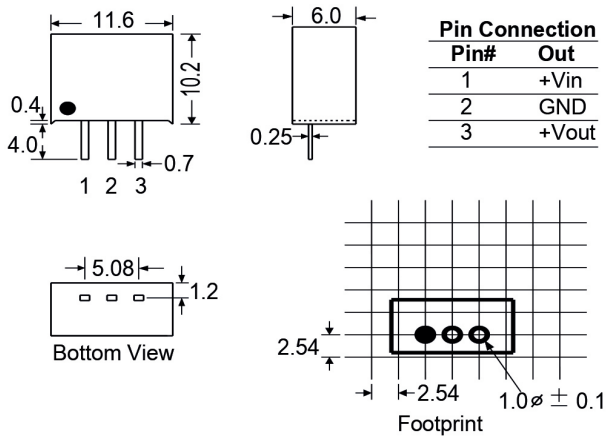
The Filtering Circuit for LMP78\_xx-1.0



| Part Number   | C1, C2<br>(Ceramic Capacitor) | C3<br>(Ceramic Capacitor) | C4<br>(Ceramic Capacitor) | L1, L2<br>(SD5825D1M-470K) SDE<br>(SR0602 470K) ABC |
|---------------|-------------------------------|---------------------------|---------------------------|---|
| LMP78_xx-1.0  | 10uF                          | 0.1uF                     | 22uF                      | 47uH/0.5A   |
| LMP78_xx-1.0R | 10uF                          | 0.1uF                     | 22uF                      | 47uH/0.5A   |

### Mechanical dimensions/footprint

Package LMP78\_xx-1.0



Package for models LMP78\_6.5-1.0R, LMP78\_09-1.0R, LMP78\_12-1.0R and LMP78\_15-1.0R

