

## 500mA Fixed Output CMOS LDO

### Features

- Very Low Dropout Voltage
- 500mA Output Current
- High Output Voltage Accuracy
- Standard or Custom Output Voltages
- Over Current and Over Temperature Protection

### Applications

- Battery Operated Systems
- Portable Computers
- Medical Instruments
- Instrumentation
- Cellular/GSM/PHS Phones
- Linear Post-Regulators for SMPS
- Pagers

### Device Selection Table

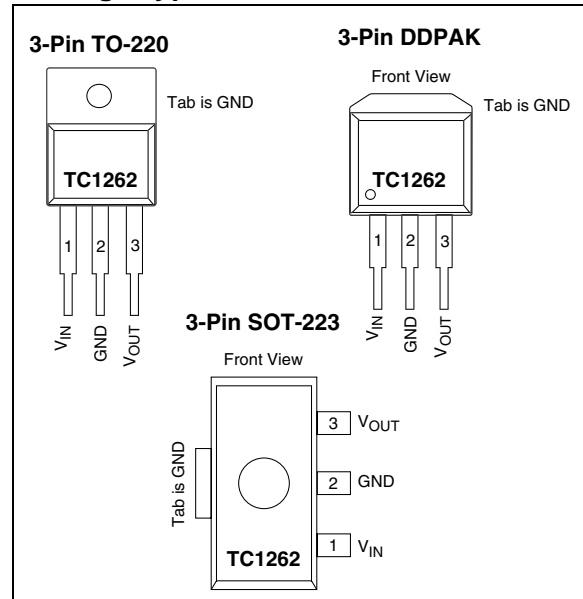
| Part Number  | Package       | Junction Temp. Range |
|--------------|---------------|----------------------|
| TC1262-xxVDB | 3-Pin SOT-223 | -40°C to +125°C      |
| TC1262-xxVAB | 3-Pin TO-220  | -40°C to +125°C      |
| TC1262-xxVEB | 3-Pin DDPAK   | -40°C to +125°C      |

**NOTE:** xx indicates output voltages.

Available Output Voltages: 2.5, 2.8, 3.0, 3.3, 5.0.

Other output voltages are available. Please contact Microchip Technology Inc. for details.

### Package Type



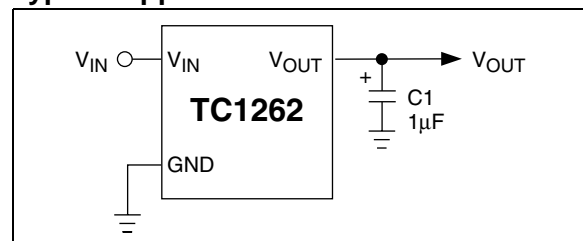
### General Description

The TC1262 is a fixed output, high accuracy (typically  $\pm 0.5\%$ ) CMOS low dropout regulator. Designed specifically for battery-operated systems, the TC1262's CMOS construction eliminates wasted ground current, significantly extending battery life. Total supply current is typically  $80\mu\text{A}$  at full load (20 to 60 times lower than in bipolar regulators).

TC1262 key features include ultra low noise operation, very low dropout voltage (typically 350mV at full load), and fast response to step changes in load.

The TC1262 incorporates both over temperature and over current protection. The TC1262 is stable with an output capacitor of only  $1\mu\text{F}$  and has a maximum output current of 500mA. It is available in 3-Pin SOT-223, 3-Pin TO-220 and 3-Pin DDPAK packages.

### Typical Application



# TC1262

## 1.0 ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings\*

|                                  |                                                      |
|----------------------------------|------------------------------------------------------|
| Input Voltage .....              | 6.5V                                                 |
| Output Voltage.....              | (V <sub>SS</sub> - 0.3V) to (V <sub>IN</sub> + 0.3V) |
| Power Dissipation.....           | Internally Limited ( <b>Note 6</b> )                 |
| Maximum Voltage on Any Pin ..... | V <sub>IN</sub> +0.3V to -0.3V                       |
| Operating Temperature Range..... | -40°C < T <sub>J</sub> < 125°C                       |
| Storage Temperature.....         | -65°C to +150°C                                      |

\*Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operation sections of the specifications is not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability.

### TC1262 ELECTRICAL SPECIFICATIONS

| Electrical Characteristics: V <sub>IN</sub> = V <sub>OUT</sub> + 1V, I <sub>L</sub> = 100μA, C <sub>L</sub> = 3.3μF, T <sub>A</sub> = 25°C, unless otherwise noted. <b>Boldface</b> type specifications apply for junction temperatures of -40°C to +125°C. |                                          |                                  |                           |                                                     |        |                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------|---------------------------|-----------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------|
| Symbol                                                                                                                                                                                                                                                      | Parameter                                | Min                              | Typ                       | Max                                                 | Units  | Test Conditions                                                                                                        |
| V <sub>IN</sub>                                                                                                                                                                                                                                             | Input Operating Voltage                  | <b>2.7</b>                       | —                         | <b>6.0</b>                                          | V      | <b>Note 7</b>                                                                                                          |
| I <sub>OUTMAX</sub>                                                                                                                                                                                                                                         | Maximum Output Current                   | <b>500</b>                       | —                         | —                                                   | mA     |                                                                                                                        |
| V <sub>OUT</sub>                                                                                                                                                                                                                                            | Output Voltage                           | —<br><b>V<sub>R</sub> - 2.5%</b> | V <sub>R</sub> ±0.5%<br>— | —<br><b>V<sub>R</sub> + 2.5%</b>                    | V      | <b>Note 1</b>                                                                                                          |
| ΔV <sub>OUT</sub> /ΔT                                                                                                                                                                                                                                       | V <sub>OUT</sub> Temperature Coefficient | —                                | 40                        | —                                                   | ppm/°C | <b>Note 2</b>                                                                                                          |
| ΔV <sub>OUT</sub> /ΔV <sub>IN</sub>                                                                                                                                                                                                                         | Line Regulation                          | —                                | .003                      | <b>0.35</b>                                         | %/V    | (V <sub>R</sub> + 1V) ≤ V <sub>IN</sub> ≤ 6V                                                                           |
| ΔV <sub>OUT</sub> /V <sub>OUT</sub>                                                                                                                                                                                                                         | Load Regulation                          | —                                | 0.002                     | <b>0.01</b>                                         | %/mA   | I <sub>L</sub> = 0.1mA to I <sub>OUTMAX</sub> ( <b>Note 3</b> )                                                        |
| V <sub>IN</sub> -V <sub>OUT</sub>                                                                                                                                                                                                                           | Dropout Voltage                          | —                                | 20<br>60<br>200<br>350    | <b>30</b><br><b>130</b><br><b>390</b><br><b>650</b> | mV     | I <sub>L</sub> = 100μA<br>I <sub>L</sub> = 100mA<br>I <sub>L</sub> = 300mA<br>I <sub>L</sub> = 500mA ( <b>Note 4</b> ) |
| I <sub>DD</sub>                                                                                                                                                                                                                                             | Supply Current                           | —                                | 80                        | <b>130</b>                                          | μA     | I <sub>L</sub> = 0                                                                                                     |
| PSRR                                                                                                                                                                                                                                                        | Power Supply Rejection Ratio             | —                                | 64                        | —                                                   | dB     | F <sub>RE</sub> ≤ 1kHz                                                                                                 |
| I <sub>OUTSC</sub>                                                                                                                                                                                                                                          | Output Short Circuit Current             | —                                | 1200                      | —                                                   | mA     | V <sub>OUT</sub> = 0V                                                                                                  |
| ΔV <sub>OUT</sub> /ΔP <sub>D</sub>                                                                                                                                                                                                                          | Thermal Regulation                       | —                                | 0.04                      | —                                                   | V/W    | <b>Note 5</b>                                                                                                          |
| eN                                                                                                                                                                                                                                                          | Output Noise                             | —                                | 260                       | —                                                   | nV/√Hz | I <sub>L</sub> = I <sub>OUTMAX</sub> , F <sub>RE</sub> = 10kHz                                                         |

**Note 1:** V<sub>R</sub> is the regulator output voltage setting.

**Note 2:**  $TC V_{OUT} = \frac{(V_{OUTMAX} - V_{OUTMIN}) \times 10^6}{V_{OUT} \times \Delta T}$

- 3:** Regulation is measured at a constant junction temperature using low duty cycle pulse testing. Load regulation is tested over a load range from 0.1mA to the maximum specified output current. Changes in output voltage due to heating effects are covered by the thermal regulation specification.
- 4:** Dropout voltage is defined as the input to output differential at which the output voltage drops 2% below its nominal value measured at a 1V differential.
- 5:** Thermal Regulation is defined as the change in output voltage at a time T after a change in power dissipation is applied, excluding load or line regulation effects. Specifications are for a current pulse equal to I<sub>LMAX</sub> at V<sub>IN</sub> = 6V for T = 10 msec.
- 6:** The maximum allowable power dissipation is a function of ambient temperature, the maximum allowable junction temperature and the thermal resistance from junction-to-air (i.e., T<sub>A</sub>, T<sub>J</sub>, θ<sub>JA</sub>). Exceeding the maximum allowable power dissipation causes the device to initiate thermal shutdown. Please see Section 4.0 Thermal Considerations for more details.
- 7:** The minimum V<sub>IN</sub> has to justify the conditions: V<sub>IN</sub> ≥ V<sub>R</sub> + V<sub>DROPOUT</sub> and V<sub>IN</sub> ≥ 2.7V for I<sub>L</sub> = 0.1mA to I<sub>OUTMAX</sub>.

# TC1262

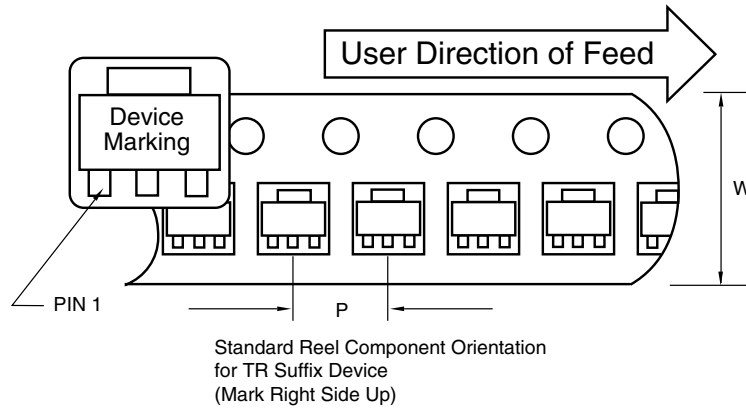
## 6.0 PACKAGING INFORMATION

### 6.1 Package Marking Information

Package marking data not available at this time.

### 6.2 Taping Form

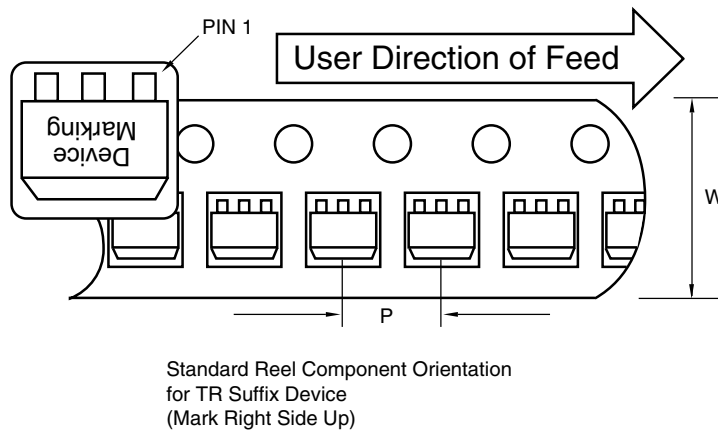
#### Component Taping Orientation for 3-Pin SOT-223 Devices



**Carrier Tape, Number of Components Per Reel and Reel Size**

| Package       | Carrier Width (W) | Pitch (P) | Part Per Full Reel | Reel Size |
|---------------|-------------------|-----------|--------------------|-----------|
| 3-Pin SOT-223 | 12 mm             | 8 mm      | 4000               | 13 in     |

#### Component Taping Orientation for 3-Pin DDPAK Devices

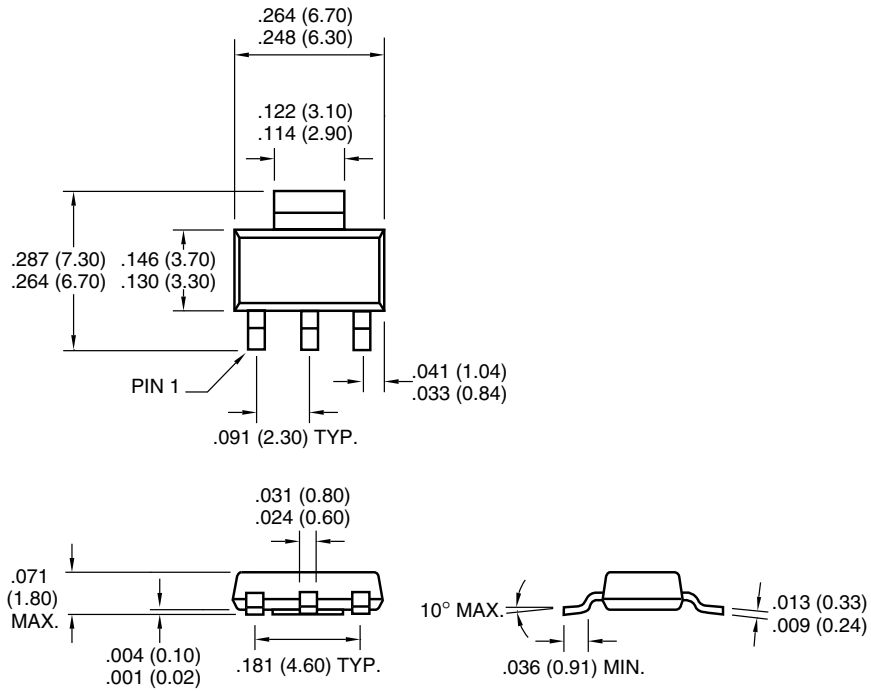


**Carrier Tape, Number of Components Per Reel and Reel Size**

| Package     | Carrier Width (W) | Pitch (P) | Part Per Full Reel | Reel Size |
|-------------|-------------------|-----------|--------------------|-----------|
| 3-Pin DDPAK | 24 mm             | 16 mm     | 750                | 13 in     |

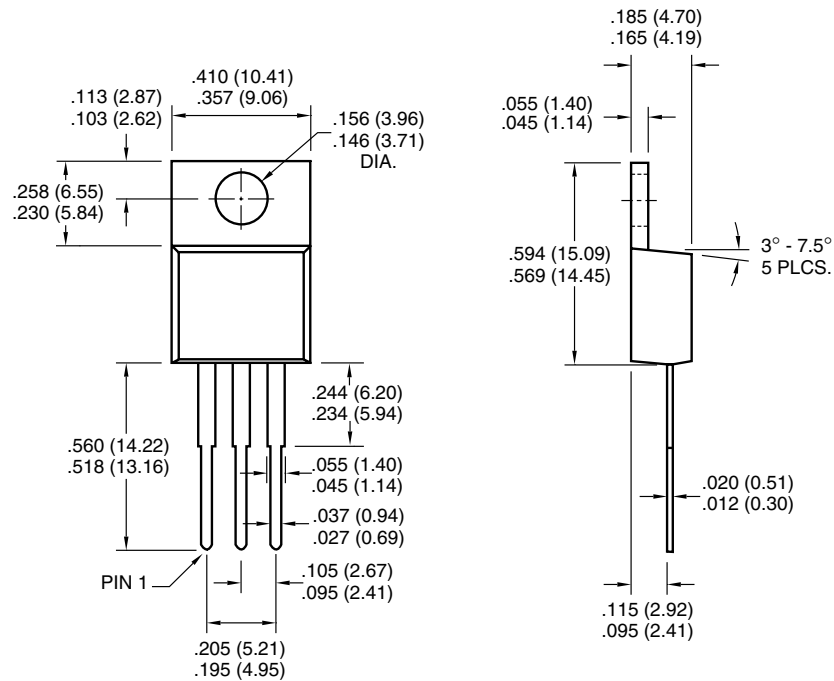
## 6.3 Package Dimensions

### 3-Pin SOT-223



Dimensions: inches (mm)

### 3-Pin TO-220



Dimensions: inches (mm)