

## 1.0 ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings †

Input Voltage .....6.5V  
 Output Voltage..... ( $V_{SS} - 0.3V$ ) to ( $V_{IN} + 0.3V$ )  
 Power Dissipation.....Internally Limited (**Note 8**)  
 Maximum Voltage on Any Pin .....  $V_{IN} + 0.3V$  to  $-0.3V$   
 Operating Temperature Range.....  $-40^{\circ}C < T_J < 125^{\circ}C$   
 Storage Temperature.....  $-65^{\circ}C$  to  $+150^{\circ}C$

† **Notice:** Stresses above those listed under "Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

### DC CHARACTERISTICS

| <b>Electrical Specifications:</b> Unless otherwise indicated, $V_{IN} = V_R + 1.5V$ , ( <b>Note 1</b> ), $I_L = 100 \mu A$ , $C_L = 3.3 \mu F$ , $\overline{SHDN} > V_{IH}$ , $T_A = +25^{\circ}C$ . <b>Boldface</b> type specifications apply for junction temperatures of $-40^{\circ}C$ to $+125^{\circ}C$ . |                                |               |                 |               |                  |                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------|-----------------|---------------|------------------|----------------------------------------------------------------|
| Parameters                                                                                                                                                                                                                                                                                                      | Sym                            | Min           | Typ             | Max           | Units            | Conditions                                                     |
| Input Operating Voltage                                                                                                                                                                                                                                                                                         | $V_{IN}$                       | <b>2.7</b>    | —               | <b>6.0</b>    | V                | <b>Note 2</b>                                                  |
| Maximum Output Current                                                                                                                                                                                                                                                                                          | $I_{OUTMAX}$                   | <b>800</b>    | —               | —             | mA               |                                                                |
| Output Voltage                                                                                                                                                                                                                                                                                                  | $V_{OUT}$                      | $V_R - 2.5\%$ | $V_R \pm 0.5\%$ | $V_R + 2.5\%$ | V                | $V_R \geq 2.5V$                                                |
|                                                                                                                                                                                                                                                                                                                 |                                | $V_R - 2\%$   | $V_R \pm 0.5\%$ | $V_R + 3\%$   |                  | $V_R = 1.8V$                                                   |
|                                                                                                                                                                                                                                                                                                                 |                                | $V_R - 7\%$   | —               | $V_R + 3\%$   |                  | $I_L = 0.1 \text{ mA to } 800 \text{ mA}$<br>( <b>Note 3</b> ) |
| $V_{OUT}$ Temperature Coefficient                                                                                                                                                                                                                                                                               | $\Delta V_{OUT}/\Delta T$      | —             | 40              | —             | ppm/ $^{\circ}C$ | <b>Note 4</b>                                                  |
| Line Regulation                                                                                                                                                                                                                                                                                                 | $\Delta V_{OUT}/\Delta V_{IN}$ | —             | 0.007           | <b>0.35</b>   | %                | $(V_R + 1V) \leq V_{IN} \leq 6V$                               |
| Load Regulation ( <b>Note 5</b> )                                                                                                                                                                                                                                                                               | $\Delta V_{OUT}/I_{OUT}$       | <b>-0.01</b>  | 0.002           | 0             | %/mA             | $I_L = 0.1 \text{ mA to } I_{OUTMAX}$                          |
| Dropout Voltage ( <b>Note 6</b> )                                                                                                                                                                                                                                                                               | $V_{IN}-V_{OUT}$               | —             | 20              | <b>30</b>     | mV               | $V_R \geq 2.5V$ , $I_L = 100 \mu A$                            |
|                                                                                                                                                                                                                                                                                                                 |                                | —             | 50              | <b>160</b>    |                  | $I_L = 100 \text{ mA}$                                         |
|                                                                                                                                                                                                                                                                                                                 |                                | —             | 150             | <b>480</b>    |                  | $I_L = 300 \text{ mA}$                                         |
|                                                                                                                                                                                                                                                                                                                 |                                | —             | 260             | <b>800</b>    |                  | $I_L = 500 \text{ mA}$                                         |
|                                                                                                                                                                                                                                                                                                                 |                                | —             | 450             | <b>1300</b>   |                  | $I_L = 800 \text{ mA}$                                         |
|                                                                                                                                                                                                                                                                                                                 |                                | —             | 1000            | <b>1200</b>   |                  | $V_R = 1.8V$ , $I_L = 500 \text{ mA}$                          |
|                                                                                                                                                                                                                                                                                                                 |                                | —             | 1200            | <b>1400</b>   |                  | $I_L = 800 \text{ mA}$                                         |
| Supply Current                                                                                                                                                                                                                                                                                                  | $I_{DD}$                       | —             | 80              | <b>130</b>    | $\mu A$          | $\overline{SHDN} = V_{IH}$ , $I_L = 0$                         |
| Power Supply Rejection Ratio                                                                                                                                                                                                                                                                                    | PSRR                           | —             | 64              | —             | db               | $F \leq 1 \text{ kHz}$                                         |
| Output Short Circuit Current                                                                                                                                                                                                                                                                                    | $I_{OUTSC}$                    | —             | 1200            | —             | mA               | $V_{OUT} = 0V$                                                 |

- Note 1:**  $V_R$  is the regulator output voltage setting.
- 2:** The minimum  $V_{IN}$  has to justify the conditions:  $V_{IN} \geq V_R + V_{DROPOUT}$  and  $V_{IN} \geq 2.7V$  for  $I_L = 0.1 \text{ mA}$  to  $I_{OUTMAX}$ .
- 3:** This accuracy represents the worst-case over the entire output current and temperature range.
- 4:**
- $$TCV_{OUT} = \frac{(V_{OUTMAX} - V_{OUTMIN}) - 10^6}{V_{OUT} \times \Delta T}$$
- 5:** Regulation is measured at a constant junction temperature using low duty cycle pulse testing. Load regulation is tested over a load range from 0.1 mA to the maximum specified output current. Changes in output voltage due to heating effects are covered by the thermal regulation specification.
- 6:** Dropout voltage is defined as the input-to-output differential at which the output voltage drops 2% below its nominal value measured at a 1.5V differential.
- 7:** 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  $I_{LMAX}$  at  $V_{IN} = 6V$  for  $T = 10 \text{ ms}$ .
- 8:** 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.,  $T_A$ ,  $T_J$ ,  $\theta_{JA}$ ). Exceeding the maximum allowable power dissipation causes the device to initiate thermal shutdown. Please see **Section 5.0 "Thermal Considerations"** for more details.

## DC CHARACTERISTICS (CONTINUED)

**Electrical Specifications:** Unless otherwise indicated,  $V_{IN} = V_R + 1.5V$ , (**Note 1**),  $I_L = 100 \mu A$ ,  $C_L = 3.3 \mu F$ ,  $\overline{SHDN} > V_{IH}$ ,  $T_A = +25^\circ C$ . **Boldface** type specifications apply for junction temperatures of  $-40^\circ C$  to  $+125^\circ C$ .

| Parameters         | Sym                         | Min | Typ  | Max | Units           | Conditions                                |
|--------------------|-----------------------------|-----|------|-----|-----------------|-------------------------------------------|
| Thermal Regulation | $\Delta V_{OUT}/\Delta P_D$ | —   | 0.04 | —   | V/W             | <b>Note 7</b>                             |
| Output Noise       | eN                          | —   | 260  | —   | nV/ $\sqrt{Hz}$ | $I_L = I_{OUTMAX}$ , $F = 10 \text{ kHz}$ |

**Note 1:**  $V_R$  is the regulator output voltage setting.

**2:** The minimum  $V_{IN}$  has to justify the conditions:  $V_{IN} \geq V_R + V_{DROPOUT}$  and  $V_{IN} \geq 2.7V$  for  $I_L = 0.1 \text{ mA}$  to  $I_{OUTMAX}$ .

**3:** This accuracy represents the worst-case over the entire output current and temperature range.

**4:**

$$TCV_{OUT} = \frac{(V_{OUTMAX} - V_{OUTMIN}) - 10^6}{V_{OUT} \times \Delta T}$$

**5:** Regulation is measured at a constant junction temperature using low duty cycle pulse testing. Load regulation is tested over a load range from 0.1 mA to the maximum specified output current. Changes in output voltage due to heating effects are covered by the thermal regulation specification.

**6:** Dropout voltage is defined as the input-to-output differential at which the output voltage drops 2% below its nominal value measured at a 1.5V differential.

**7:** 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  $I_{LMAX}$  at  $V_{IN} = 6V$  for  $T = 10 \text{ ms}$ .

**8:** 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.,  $T_A$ ,  $T_J$ ,  $\theta_{JA}$ ). Exceeding the maximum allowable power dissipation causes the device to initiate thermal shutdown. Please see **Section 5.0 "Thermal Considerations"** for more details.

## TEMPERATURE CHARACTERISTICS

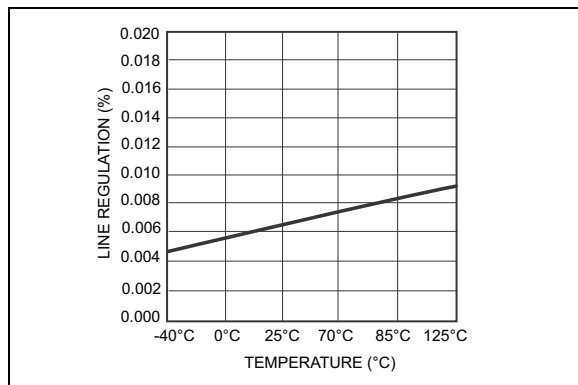
**Electrical Specifications:** Unless otherwise indicated,  $V_{IN} = V_R + 1.5V$ ,  $I_L = 100 \mu A$ ,  $C_L = 3.3 \mu F$ ,  $\overline{SHDN} > V_{IH}$ ,  $T_A = +25^\circ C$ .

| Parameters                         | Sym           | Min | Typ | Max  | Units        | Conditions      |
|------------------------------------|---------------|-----|-----|------|--------------|-----------------|
| <b>Temperature Ranges</b>          |               |     |     |      |              |                 |
| Specified Temperature Range        | $T_A$         | -40 | —   | +125 | $^\circ C$   | <b>(Note 1)</b> |
| Operating Temperature Range        | $T_J$         | -40 | —   | +125 | $^\circ C$   |                 |
| Storage Temperature Range          | $T_A$         | -65 | —   | +150 | $^\circ C$   |                 |
| <b>Thermal Package Resistances</b> |               |     |     |      |              |                 |
| Thermal Resistance, 3L-SOT-223     | $\theta_{JA}$ | —   | 59  | —    | $^\circ C/W$ |                 |
| Thermal Resistance, 3L-DDPAK       | $\theta_{JA}$ | —   | 71  | —    | $^\circ C/W$ |                 |
| Thermal Resistance, 3L-TO-220      | $\theta_{JA}$ | —   | 71  | —    | $^\circ C/W$ |                 |

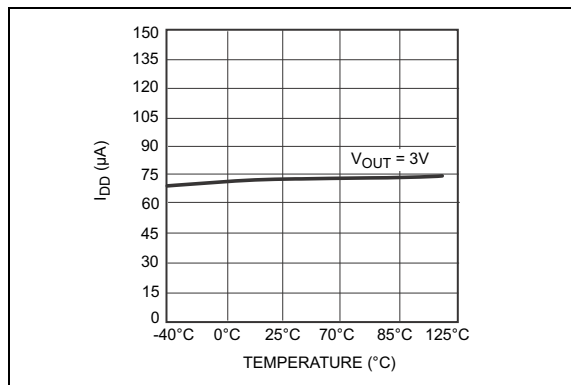
**Note 1:** Operation in this range must not cause  $T_J$  to exceed Maximum Junction Temperature ( $+125^\circ C$ ).

## 2.0 TYPICAL PERFORMANCE CURVES

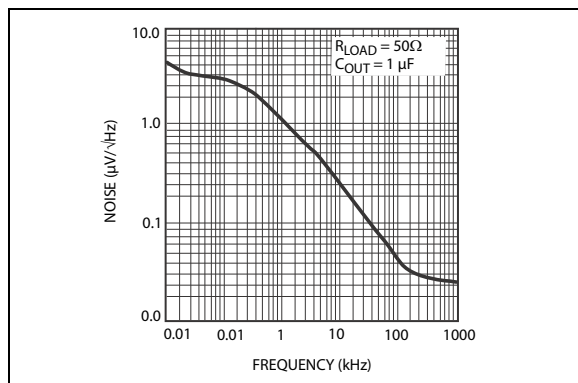
**Note:** The graphs and tables provided following this note are a statistical summary based on a limited number of samples and are provided for informational purposes only. The performance characteristics listed herein are not tested or guaranteed. In some graphs or tables, the data presented may be outside the specified operating range (e.g., outside specified power supply range) and therefore outside the warranted range.



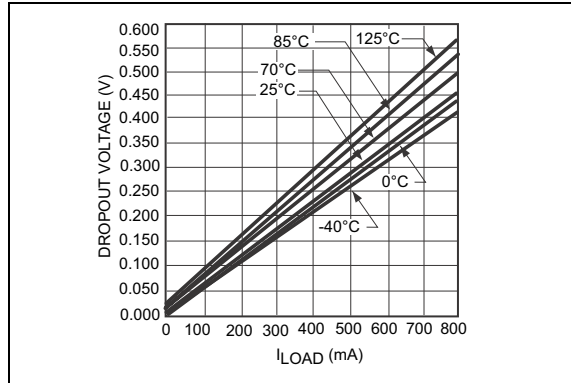
**FIGURE 2-1:** Line Regulation vs. Temperature.



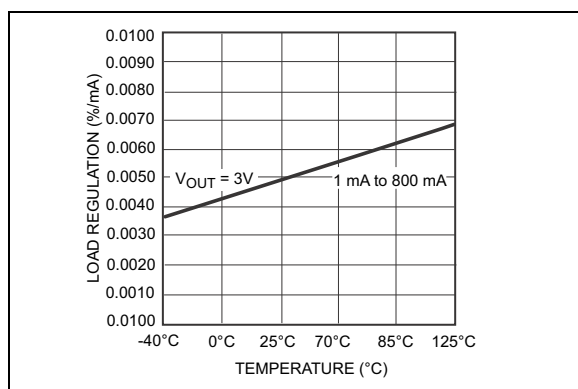
**FIGURE 2-4:**  $I_{DD}$  vs. Temperature.



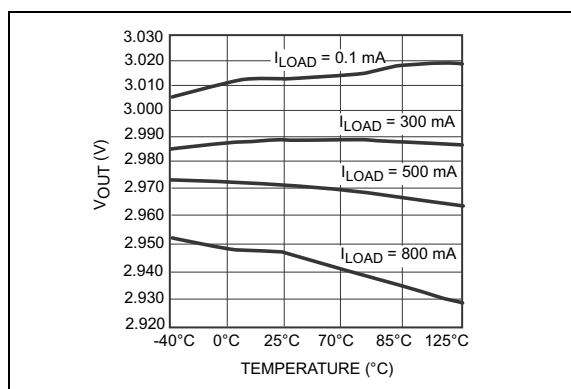
**FIGURE 2-2:** Output Noise vs. Frequency.



**FIGURE 2-5:** 3.0V Dropout Voltage vs.  $I_{LOAD}$ .



**FIGURE 2-3:** Load Regulation vs. Temperature.



**FIGURE 2-6:** 3.0V  $V_{OUT}$  vs. Temperature.

## 3.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in [Table 3-1](#).

**TABLE 3-1: PIN FUNCTION TABLE**

| Pin No.<br>3-Pin SOT-223<br>3-Pin TO-220<br>3-Pin DDPK | Symbol    | Description              |
|--------------------------------------------------------|-----------|--------------------------|
| 1                                                      | $V_{IN}$  | Unregulated supply input |
| 2                                                      | GND       | Ground terminal          |
| 3                                                      | $V_{OUT}$ | Regulated voltage output |

### 3.1 Unregulated Supply ( $V_{IN}$ )

Unregulated supply input.

### 3.2 Ground (GND)

Ground terminal.

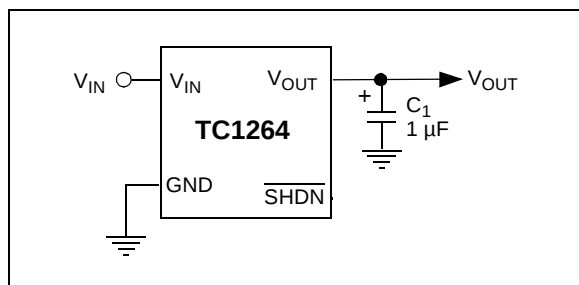
### 3.3 Regulated Output Voltage ( $V_{OUT}$ )

Regulated voltage output.

## 4.0 DETAILED DESCRIPTION

The TC1264 is a precision, fixed output LDO. Unlike bipolar regulators, the TC1264's supply current does not increase with load current. In addition,  $V_{OUT}$  remains stable and within regulation over the entire 0mA to  $I_{LOADMAX}$  load current range (an important consideration in RTC and CMOS RAM battery back-up applications).

Figure 4-1 shows a typical application circuit.



**FIGURE 4-1:** Typical Application Circuit.

## 4.1 Output Capacitor

A 1  $\mu F$  (min) capacitor from  $V_{OUT}$  to ground is required. The output capacitor should have an effective series resistance greater than  $0.1\Omega$  and less than  $5\Omega$ . A 1  $\mu F$  capacitor should be connected from  $V_{IN}$  to GND if there is more than 10 inches of wire between the regulator and the AC filter capacitor, or if a battery is used as the power source. Aluminum electrolytic or tantalum capacitor types can be used. (Since many aluminum electrolytic capacitors freeze at approximately  $-30^{\circ}C$ , solid tantalums are recommended for applications operating below  $-25^{\circ}C$ .) When operating from sources other than batteries, supply-noise rejection and transient response can be improved by increasing the value of the input and output capacitors and employing passive filtering techniques.

## 5.0 THERMAL CONSIDERATIONS

### 5.1 Thermal Shutdown

Integrated thermal protection circuitry shuts the regulator off when die temperature exceeds 160°C. The regulator remains off until the die temperature drops to approximately 150°C.

### 5.2 Power Dissipation

The amount of power the regulator dissipates is primarily a function of input and output voltage, and output current. The following equation is used to calculate worst-case actual power dissipation:

#### EQUATION 5-1:

$$P_D = (V_{INMAX} - V_{OUTMIN})I_{LOADMAX}$$

Where:

$P_D$  = Worst-case actual power dissipation

$V_{INMAX}$  = Maximum voltage on  $V_{IN}$

$V_{OUTMIN}$  = Minimum regulator output voltage

$I_{LOADMAX}$  = Maximum output (load) current

The maximum allowable power dissipation (Equation 5-2) is a function of the maximum ambient temperature ( $T_{AMAX}$ ), the maximum allowable die temperature ( $T_{JMAX}$ ) and the thermal resistance from junction-to-air ( $\theta_{JA}$ ).

#### EQUATION 5-2:

$$P_{DMAX} = \frac{(T_{JMAX} - T_{AMAX})}{\theta_{JA}}$$

Where all terms are previously defined.

Table 5-1 and Table 5-2 show various values of  $\theta_{JA}$  for the TC1264 packages.

**TABLE 5-1: THERMAL RESISTANCE GUIDELINES FOR TC1264 IN SOT-223 PACKAGE**

| Copper Area (Topside)* | Copper Area (Backside) | Board Area | Thermal Resistance ( $\theta_{JA}$ ) |
|------------------------|------------------------|------------|--------------------------------------|
| 2500 sq mm             | 2500 sq mm             | 2500 sq mm | 45°C/W                               |
| 1000 sq mm             | 2500 sq mm             | 2500 sq mm | 45°C/W                               |
| 225 sq mm              | 2500 sq mm             | 2500 sq mm | 53°C/W                               |
| 100 sq mm              | 2500 sq mm             | 2500 sq mm | 59°C/W                               |
| 1000 sq mm             | 1000 sq mm             | 1000 sq mm | 52°C/W                               |
| 1000 sq mm             | 0 sq mm                | 1000 sq mm | 55°C/W                               |

\* Tab of device attached to topside copper

**TABLE 5-2: THERMAL RESISTANCE GUIDELINES FOR TC1264 IN 3-PIN DDPK/TO-220 PACKAGE**

| Copper Area (Topside)* | Copper Area (Backside) | Board Area | Thermal Resistance ( $\theta_{JA}$ ) |
|------------------------|------------------------|------------|--------------------------------------|
| 2500 sq mm             | 2500 sq mm             | 2500 sq mm | 25°C/W                               |
| 1000 sq mm             | 2500 sq mm             | 2500 sq mm | 27°C/W                               |
| 125 sq mm              | 2500 sq mm             | 2500 sq mm | 35°C/W                               |

\* Tab of device attached to topside copper

Equation 5-1 can be used in conjunction with Equation 5-2 to ensure regulator thermal operation is within limits. For example:

Given:

$$V_{INMAX} = 3.3V \pm 10\%$$

$$V_{OUTMIN} = 2.7V \pm 0.5\%$$

$$I_{LOADMAX} = 275 \text{ mA}$$

$$T_{JMAX} = 125^\circ\text{C}$$

$$T_{AMAX} = 95^\circ\text{C}$$

$$\theta_{JA} = 59^\circ\text{C/W (SOT-223)}$$

Find:

- Actual power dissipation.
- Maximum allowable dissipation.

Actual power dissipation:

$$P_D \approx (V_{INMAX} - V_{OUTMIN})I_{LOADMAX}$$

$$P_D = (3.3 \times 1.1) - (2.7 \times .995)275 \times 10^{-3}$$

$$P_D = 260 \text{ mW}$$

Maximum allowable power dissipation:

$$P_{DMAX} = \frac{T_{JMAX} - T_{AMAX}}{\theta_{JA}}$$

$$P_{DMAX} = \frac{(125 - 95)}{59}$$

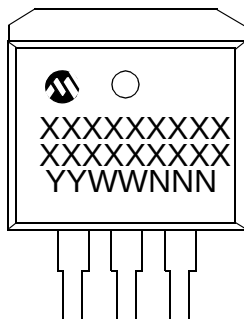
$$P_{DMAX} = 508 \text{ mW}$$

In this example, the TC1264 dissipates a maximum of 260 mW, which is below the allowable limit of 508 mW. In a similar manner, Equation 5-1 and Equation 5-2 can be used to calculate maximum current and/or input voltage limits. For example, the maximum allowable  $V_{IN}$ , is found by substituting the maximum allowable power dissipation of 508 mW into Equation 5-1, from which  $V_{INMAX} = 4.6V$ .

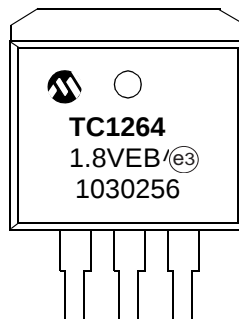
## 6.0 PACKAGING INFORMATION

### 6.1 Package Marking Information

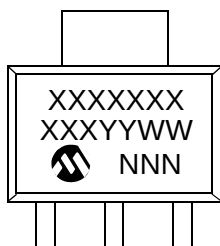
3-Lead DDPAK



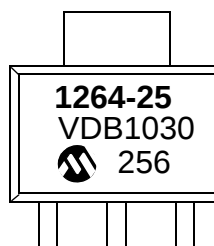
Example



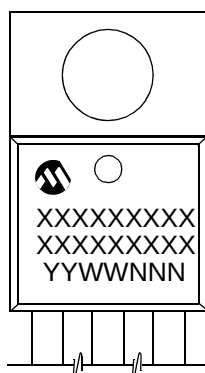
3-Lead SOT-223



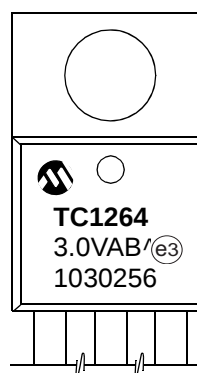
Example



3-Lead TO-220



Example

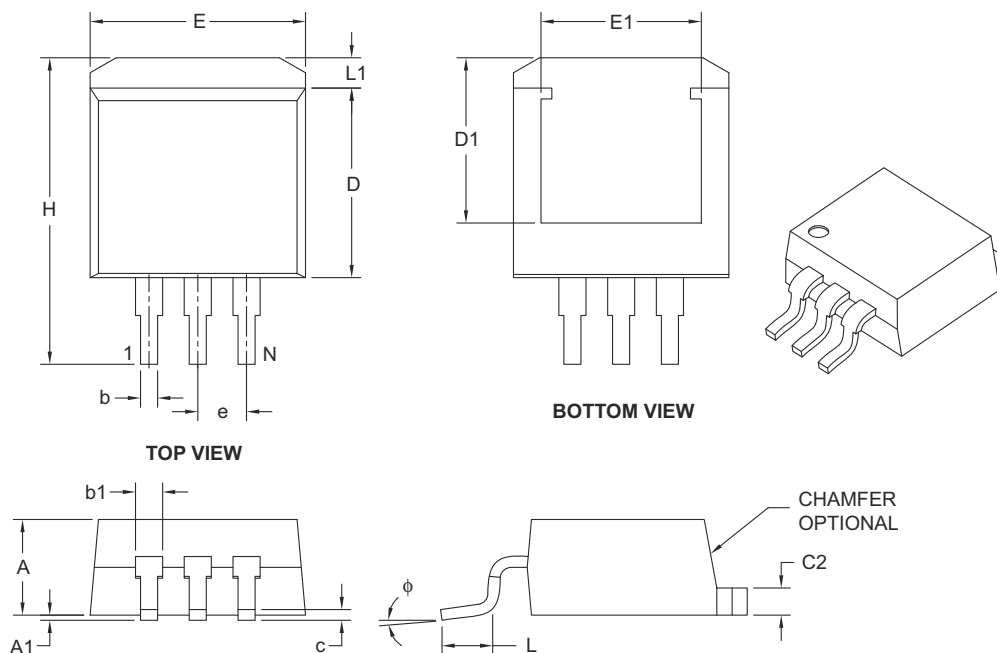


|                |        |                                                                                                                  |
|----------------|--------|------------------------------------------------------------------------------------------------------------------|
| <b>Legend:</b> | XX...X | Customer-specific information                                                                                    |
|                | Y      | Year code (last digit of calendar year)                                                                          |
|                | YY     | Year code (last 2 digits of calendar year)                                                                       |
|                | WW     | Week code (week of January 1 is week '01')                                                                       |
|                | NNN    | Alphanumeric traceability code                                                                                   |
|                | (e3)   | Pb-free JEDEC designator for Matte Tin (Sn)                                                                      |
|                | *      | This package is Pb-free. The Pb-free JEDEC designator (e3) can be found on the outer packaging for this package. |

**Note:** In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information.

## 3-Lead Plastic (EB) [DDPAK]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



| Units                 |    | INCHES   |     |      |
|-----------------------|----|----------|-----|------|
| Dimension Limits      |    | MIN      | NOM | MAX  |
| Number of Pins        | N  | 3        |     |      |
| Pitch                 | e  | .100 BSC |     |      |
| Overall Height        | A  | .160     | —   | .190 |
| Standoff §            | A1 | .000     | —   | .010 |
| Overall Width         | E  | .380     | —   | .420 |
| Exposed Pad Width     | E1 | .245     | —   | —    |
| Molded Package Length | D  | .330     | —   | .380 |
| Overall Length        | H  | .549     | —   | .625 |
| Exposed Pad Length    | D1 | .270     | —   | —    |
| Lead Thickness        | c  | .014     | —   | .029 |
| Pad Thickness         | C2 | .045     | —   | .065 |
| Lower Lead Width      | b  | .020     | —   | .039 |
| Upper Lead Width      | b1 | .045     | —   | .070 |
| Foot Length           | L  | .068     | —   | .110 |
| Pad Length            | L1 | —        | —   | .067 |
| Foot Angle            | φ  | 0°       | —   | 8°   |

### Notes:

- § Significant Characteristic.
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

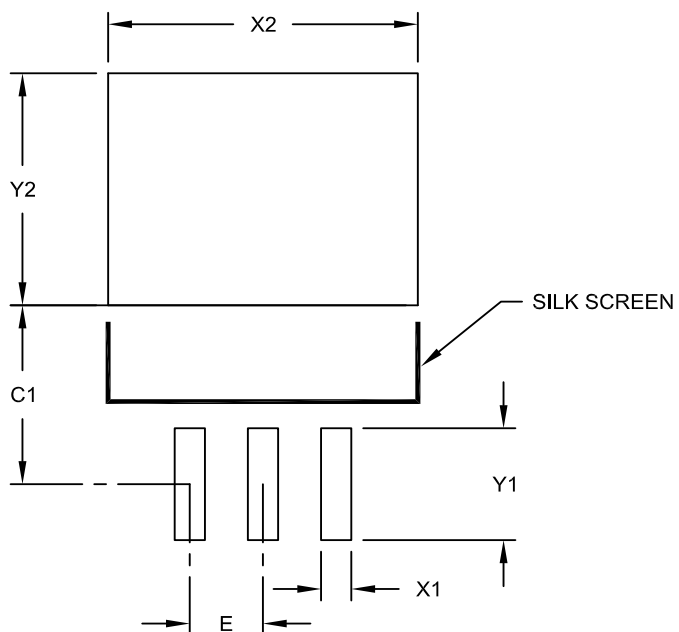
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-011B

# TC1264

## 3-Lead Plastic (EB) [DDPAK]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



RECOMMENDED LAND PATTERN

| Dimension Limits        | Units | INCHES   |      |      |
|-------------------------|-------|----------|------|------|
|                         |       | MIN      | NOM  | MAX  |
| Contact Pitch           | E     | .100 BSC |      |      |
| Pad Width               | X2    |          |      | .423 |
| Pad Length              | Y2    |          |      | .327 |
| Contact Pad Spacing     | C1    |          | .252 |      |
| Contact Pad Width (X3)  | X1    |          |      | .041 |
| Contact Pad Length (X3) | Y1    |          |      | .157 |

**Notes:**

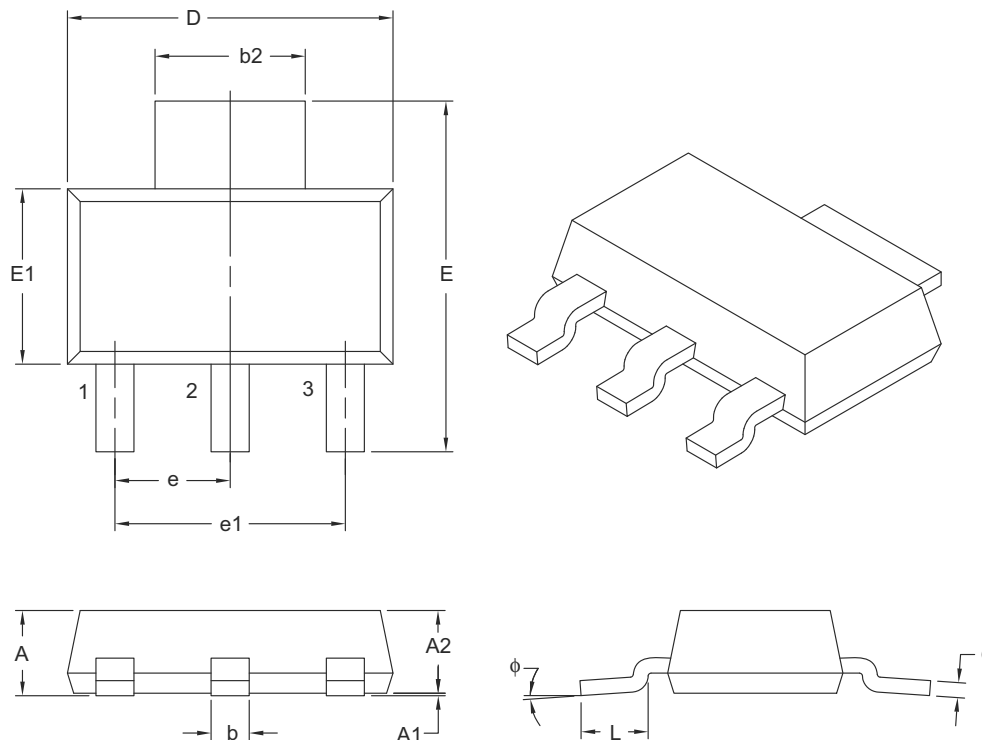
1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2011A

## 3-Lead Plastic Small Outline Transistor (DB) [SOT-223]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



|                       |    | Units | MILLIMETERS |      |      |
|-----------------------|----|-------|-------------|------|------|
| Dimension Limits      |    |       | MIN         | NOM  | MAX  |
| Number of Leads       | N  |       | 3           |      |      |
| Lead Pitch            | e  |       | 2.30 BSC    |      |      |
| Outside Lead Pitch    | e1 |       | 4.60 BSC    |      |      |
| Overall Height        | A  |       | —           | —    | 1.80 |
| Standoff              | A1 |       | 0.02        | —    | 0.10 |
| Molded Package Height | A2 |       | 1.50        | 1.60 | 1.70 |
| Overall Width         | E  |       | 6.70        | 7.00 | 7.30 |
| Molded Package Width  | E1 |       | 3.30        | 3.50 | 3.70 |
| Overall Length        | D  |       | 6.30        | 6.50 | 6.70 |
| Lead Thickness        | c  |       | 0.23        | 0.30 | 0.35 |
| Lead Width            | b  |       | 0.60        | 0.76 | 0.84 |
| Tab Lead Width        | b2 |       | 2.90        | 3.00 | 3.10 |
| Foot Length           | L  |       | 0.75        | —    | —    |
| Lead Angle            | φ  |       | 0°          | —    | 10°  |

**Notes:**

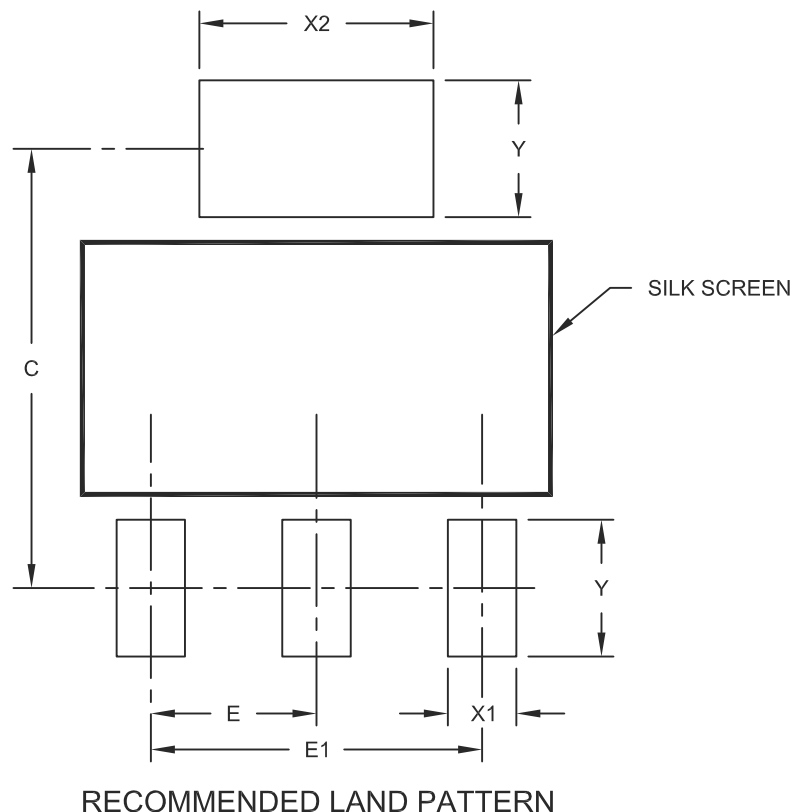
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-032B

## 3-Lead Plastic Small Outline Transistor (DB) [SOT-223]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



| Dimension Limits    | Units | MILLIMETERS |      |      |
|---------------------|-------|-------------|------|------|
|                     |       | MIN         | NOM  | MAX  |
| Contact Pitch       | E     | 2.30 BSC    |      |      |
| Overall Pitch       | E1    | 4.60 BSC    |      |      |
| Contact Pad Spacing | C     |             | 6.10 |      |
| Contact Pad Width   | X1    |             |      | 0.95 |
| Contact Pad Width   | X2    |             |      | 3.25 |
| Contact Pad Length  | Y     |             |      | 1.90 |

**Notes:**

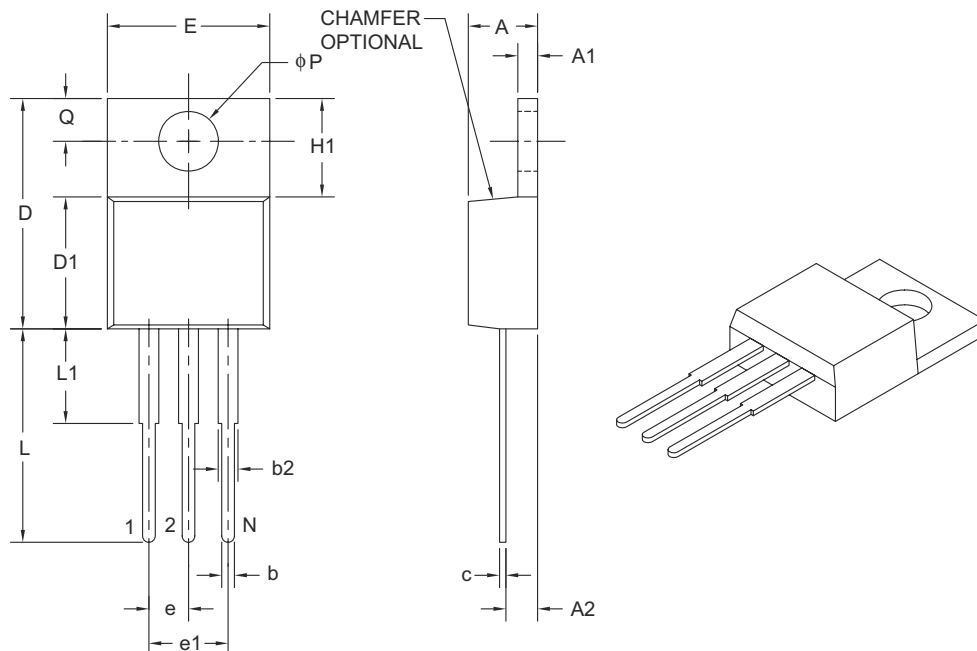
1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2032A

## 3-Lead Plastic Transistor Outline (AB) [TO-220]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



| Units                  |          | INCHES   |      |      |
|------------------------|----------|----------|------|------|
| Dimension Limits       |          | MIN      | NOM  | MAX  |
| Number of Pins         | N        | 3        |      |      |
| Pitch                  | e        | .100 BSC |      |      |
| Overall Pin Pitch      | e1       | .200 BSC |      |      |
| Overall Height         | A        | .140     | —    | .190 |
| Tab Thickness          | A1       | .020     | —    | .055 |
| Base to Lead           | A2       | .080     | —    | .115 |
| Overall Width          | E        | .357     | —    | .420 |
| Mounting Hole Center   | Q        | .100     | —    | .120 |
| Overall Length         | D        | .560     | —    | .650 |
| Molded Package Length  | D1       | .330     | —    | .355 |
| Tab Length             | H1       | .230     | —    | .270 |
| Mounting Hole Diameter | $\phi P$ | .139     | —    | .156 |
| Lead Length            | L        | .500     | —    | .580 |
| Lead Shoulder          | L1       | —        | —    | .250 |
| Lead Thickness         | c        | .012     | —    | .024 |
| Lead Width             | b        | .015     | .027 | .040 |
| Shoulder Width         | b2       | .045     | .057 | .070 |

**Notes:**

- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-034B

# TC1264

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NOTES:

## APPENDIX A: REVISION HISTORY

### Revision D (September 2010)

The following is the list of modifications:

1. Updated [Figure 2-4](#).
2. Updated package drawings (C04-011B, C04-2011A, C04-032B, C04-2032A, C04-034B).

### Revision C (October 2006)

The following is the list of modifications:

1. **Section 1.0 “Electrical Characteristics”:** Changed dropout voltage typical value for  $I_L = 500$  mA from 700 to 1000 and maximum value from 1000 to 1200 for. Changed typical value for  $I_L = 800$  mA from 890 to 1200.
2. **Section 6.0 “PackAging Information”:** Added package marking information and package outline drawings.
3. Added disclaimer to package outline drawings.

### Revision B (May 2002)

- Undocumented Changes.

### Revision A (March 2002)

- Original Release of this Document.

# TC1264

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NOTES:

## PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

| <u>PART NO.</u>  | <u>X.XX</u>                                                                                                                                                                                                                               | <u>XX</u> | <u>XX</u>     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------|
| Device           | Voltage Option                                                                                                                                                                                                                            | Package   | Tape and Reel |
|                  |                                                                                                                                                                                                                                           |           |               |
| Device           | TC1264 Fixed Output CMOS LDO                                                                                                                                                                                                              |           |               |
| Voltage Option:* | 1.8V = 1.8V<br>2.5V = 2.5V<br>3.0V = 3.0V<br>3.3V = 3.3V<br><br>* Other output voltages are available. Please contact your local Microchip sales office for details.                                                                      |           |               |
| Package          | AB = Plastic (TO-220), 3-Lead<br>DB = Plastic (SOT-223), 3-lead<br>DBTR = Plastic (SOT-223), 3-lead, Tape and Reel<br>EB = Plastic Transistor Outline (DDPAK), 3-Lead<br>EBTR = Plastic Transistor Outline (DDPAK), 3-Lead, Tape and Reel |           |               |

|                  |                 |                                       |
|------------------|-----------------|---------------------------------------|
| <b>Examples:</b> |                 |                                       |
| a)               | TC1264-1.8VAB   | 1.8V LDO, TO-220-3 pkg.               |
| b)               | TC1264-2.5VAB   | 2.5V LDO, TO-220-3 pkg.               |
| c)               | TC1264-3.0VAB   | 3.0V LDO, TO-220-3 pkg.               |
| d)               | TC1264-3.3VAB   | 3.3V LDO, TO-220-3 pkg.               |
|                  |                 |                                       |
| a)               | TC1264-1.8VEBTR | 1.8V LDO, DDPAK-3 pkg., Tape and Reel |
| b)               | TC1264-2.5VEBTR | 2.5V LDO, DDPAK-3 pkg., Tape and Reel |
| c)               | TC1264-3.0VEBTR | 3.0V LDO, DDPAK-3 pkg., Tape and Reel |
| d)               | TC1264-3.3VEBTR | 3.3V LDO, DDPAK-3 pkg., Tape and Reel |
|                  |                 |                                       |
| a)               | TC1264-1.8VDB   | 1.8V LDO, SOT-223 pkg.                |
| b)               | TC1264-1.8VDBTR | 1.8V LDO, SOT-223 pkg., Tape and Reel |
| c)               | TC1264-2.5VDB   | 2.5V LDO, SOT-223 pkg.                |
| d)               | TC1264-2.5VDBTR | 2.5V LDO, SOT-223 pkg., Tape and Reel |
|                  |                 |                                       |
| e)               | TC1264-3.0VDB   | 3.0V LDO, SOT-223 pkg.                |
| f)               | TC1264-3.0VDBTR | 3.0V LDO, SOT-223 pkg., Tape and Reel |
|                  |                 |                                       |
| g)               | TC1264-3.3VDB   | 3.3V LDO, SOT-223 pkg.                |
| h)               | TC1264-3.3VDBTR | 3.3V LDO, SOT-223 pkg., Tape and Reel |

# TC1264

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NOTES:

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