

November 22, 1999

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## DESCRIPTION

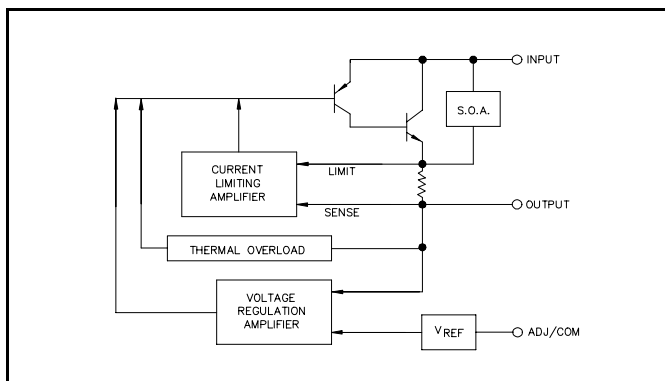
The EZ1584 series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current. Additionally, the EZ1584 series provides excellent regulation over variations in line, load and temperature.

Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The EZ1584 series are three terminal regulators with fixed and adjustable voltage options available in the popular TO-220 package.

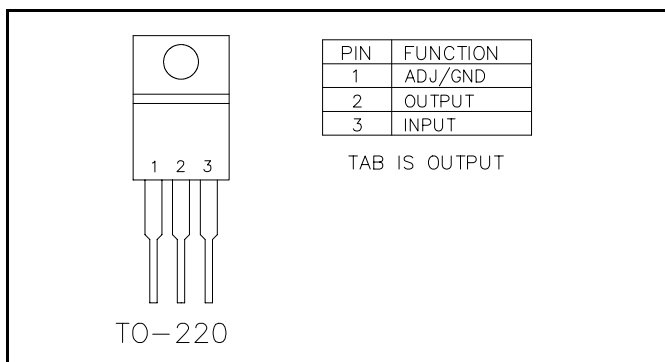
## APPLICATIONS

- Pentium® Processor supplies
- PowerPC™ supplies
- Other 2.5V to 3.6V microprocessor supplies
- Low voltage logic supplies
- Battery-powered circuitry
- Post regulator for switching supply

## BLOCK DIAGRAM



## PIN CONFIGURATION



## FEATURES

- Low dropout performance, 1.3V max. for EZ1584
- Full current rating over line and temperature
- Fast transient response
- $\pm 2\%$  total output regulation over line, load and temperature
- Adjust pin current max 90 $\mu$ A over temperature
- Fixed/adjustable output voltage
- Line regulation typically 0.015%
- Load regulation typically 0.05%
- TO-220 package

## ORDERING INFORMATION

| DEVICE       | PACKAGE | V <sub>OUT</sub> VOLTS |
|--------------|---------|------------------------|
| EZ1584CT-X.X | TO-220  | See Note (1)           |

Note:

(1) Where X.X denotes voltage options. Available voltages are: 1.5V, 2.5V and 3.3V. Leave blank for adjustable version (1.3 to 5.7V). Contact factory for additional voltage options.

## ABSOLUTE MAXIMUM RATINGS

| Parameter                                     | Symbol            | Maximum            | Units |
|-----------------------------------------------|-------------------|--------------------|-------|
| Input Supply Voltage                          | V <sub>IN</sub>   | 7                  | V     |
| Power Dissipation                             | P <sub>D</sub>    | Internally Limited | W     |
| Thermal Resistance Junction to Case TO-220    | $\theta_{JC}$     | 2                  | °C/W  |
| Thermal Resistance Junction to Ambient TO-220 | $\theta_{JA}$     | 50                 | °C/W  |
| Operating Junction Temperature Range          | T <sub>J</sub>    | 0 to 125           | °C    |
| Storage Temperature Range                     | T <sub>STG</sub>  | -65 to 150         | °C    |
| Lead Temperature (Soldering) 10 Sec           | T <sub>LEAD</sub> | 260                | °C    |

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## ELECTRICAL CHARACTERISTICS

Unless otherwise specified, Adj  $V_{IN} = 2.75V$  to  $7.0V$  and Adj  $I_O = 10mA$  to  $7.0A$ ;  
Fixed  $V_{IN} = 4.75$  to  $7.0V$  and Fixed  $I_O = 0$  mA to  $7.0A$

| Parameter                             | Symbol           | Test Conditions |       |             | Test Limits  |       |              | Units   |
|---------------------------------------|------------------|-----------------|-------|-------------|--------------|-------|--------------|---------|
|                                       |                  | $V_{IN}$        | $I_O$ | $T_J^{(5)}$ | Min          | Typ   | Max          |         |
| Output Voltage <sup>(1)</sup>         | $V_O$            | 5V              | 10mA  | 25°C        | 0.99 $ V_O $ | $V_O$ | 1.01 $ V_O $ | V       |
| Fixed Voltage Version                 |                  |                 |       | O.T.        | 0.98 $ V_O $ | $V_O$ | 1.02 $ V_O $ |         |
| Reference Voltage <sup>(1)</sup>      | $V_{REF}$        | 5V              | 10mA  | 25°C        | 1.238        | 1.250 | 1.262        | V       |
| Adj Voltage Version                   |                  |                 |       | O.T.        | 1.225        | 1.250 | 1.275        |         |
| Line Regulation <sup>(1)</sup>        | $REG_{(LINE)}$   |                 |       | 25°C        |              | 0.015 | 0.2          | %       |
| Fixed Voltage Version                 |                  |                 | 0mA   | O.T.        |              | 0.035 | 0.2          |         |
| Adj Voltage Version                   |                  |                 | 10mA  | O.T.        |              | 0.035 | 0.2          |         |
| Load Regulation <sup>(1)</sup>        | $REG_{(LOAD)}$   | 5V              |       | 25°C        |              | 0.05  | 0.3          | %       |
|                                       |                  |                 |       | O.T.        |              | 0.2   | 0.4          |         |
| Dropout Voltage <sup>(2)</sup>        | $V_D$            |                 |       | 25°C        |              | 1     |              | V       |
| EZ1584                                |                  |                 |       | O.T.        |              | 1.1   | 1.3          |         |
| Current Limit                         | $I_{CL}$         |                 |       | O.T.        | 7.1          | 9.0   |              | A       |
| Quiescent Current                     | $I_Q$            | 5V              |       | O.T.        |              | 10    | 13           | mA      |
| Fixed Voltage Version                 |                  |                 |       |             |              |       |              |         |
| Temperature Coefficient               | $T_C$            |                 |       | O.T.        |              | 0.005 |              | %/°C    |
| Adjust Pin Current                    | $I_{ADJ}$        |                 |       | 25°C        |              | 55    |              | μA      |
|                                       |                  |                 |       | O.T.        |              |       | 90           |         |
| Adjust Pin Current Change             | $\Delta I_{ADJ}$ |                 |       | O.T.        |              | 0.2   | 5            | μA      |
| Temperature Stability                 | $T_S$            | 5V              | 0.5A  | O.T.        |              | 0.5   |              | %       |
| Minimum Load Current                  | $I_O$            | 5V              |       | O.T.        |              | 5     | 10           | mA      |
| Adj Voltage Version                   |                  |                 |       |             |              |       |              |         |
| RMS Output Noise <sup>(3)</sup>       | $V_N$            |                 |       | 25°C        |              | 0.003 |              | % $V_O$ |
| Ripple Rejection Ratio <sup>(4)</sup> | $R_A$            | 5V              | 7.0A  | O.T.        | 60           | 72    |              | dB      |

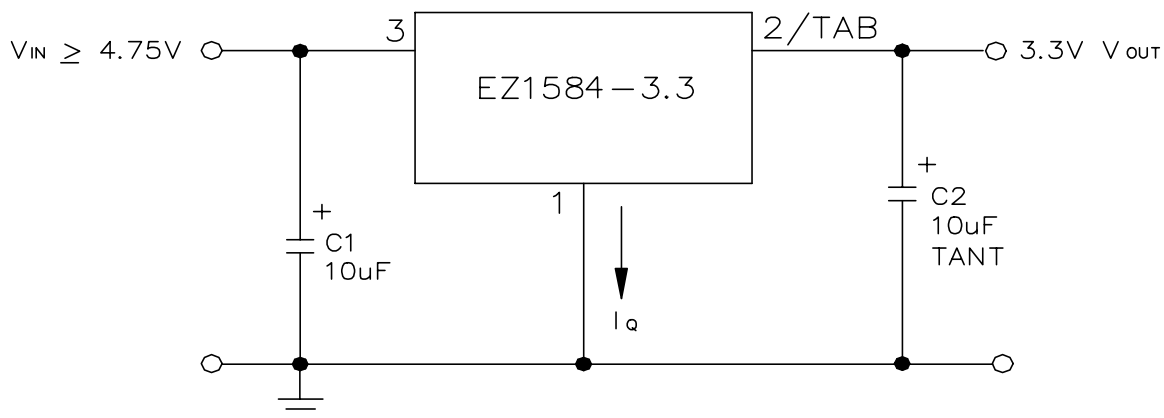
### NOTES:

- (1) Low duty cycle pulse testing with Kelvin connections required.
- (2)  $\Delta V_{OUT}, \Delta V_{REF} = 1\%$
- (3) Bandwidth of 10 Hz to 10 kHz.
- (4) 120 Hz input ripple ( $C_{ADJ}$  for ADJ = 25μF).
- (5) Over Temp. (O.T.) = over specified operating junction temperature range.

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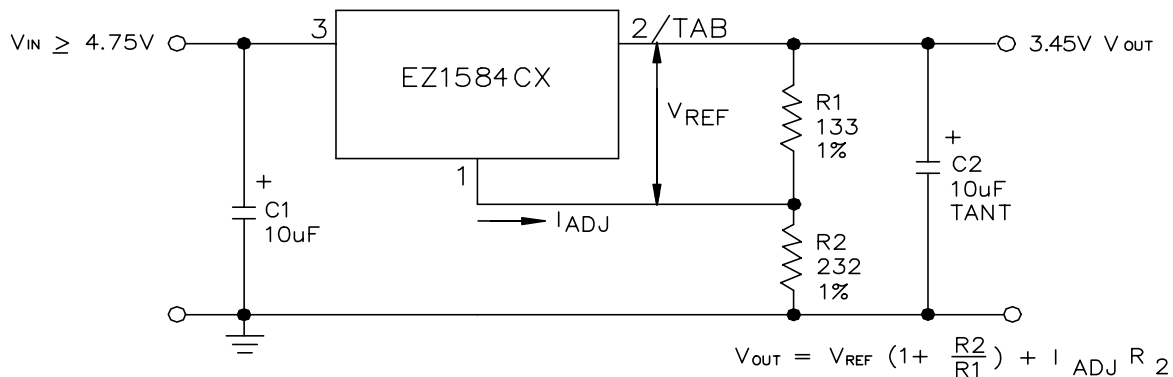
## TYPICAL APPLICATIONS

### FIXED VOLTAGE REGULATOR <sup>(1)(2)</sup>



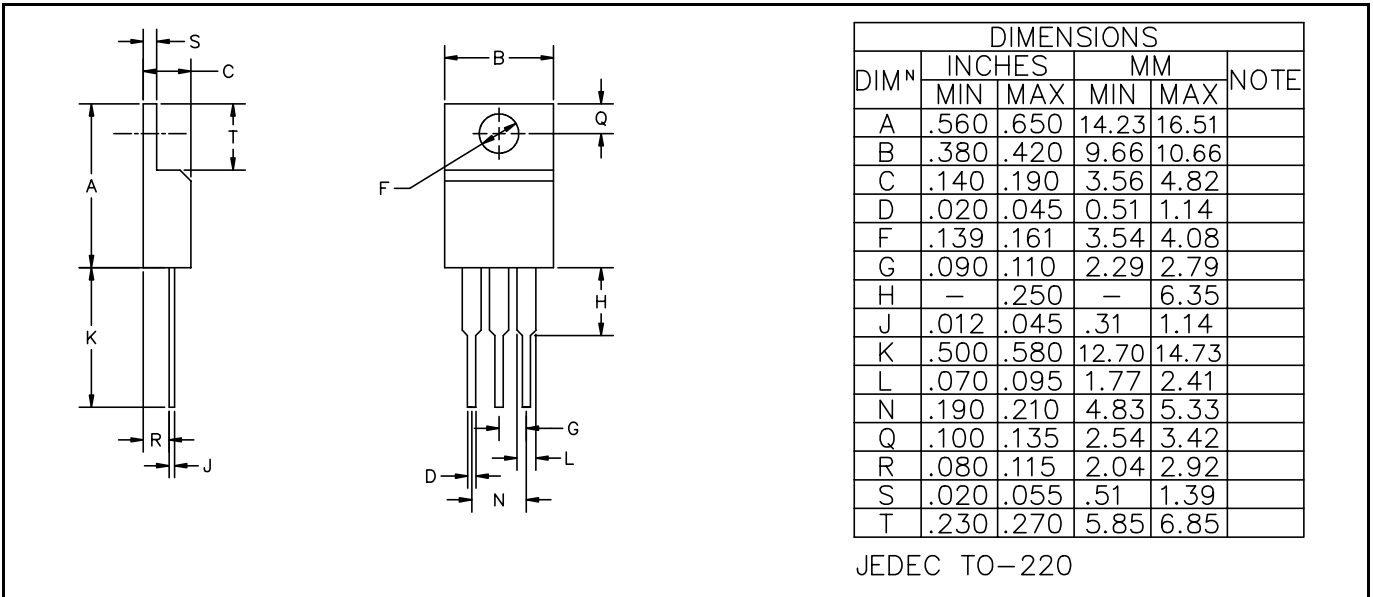
- (1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.  
 (2) C2 REQUIRED FOR STABILITY.

### ADJUSTABLE VOLTAGE REGULATOR <sup>(1)(2)</sup>



- (1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.  
 (2) C2 REQUIRED FOR STABILITY.

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**DEVICE OUTLINE - TO-220**


ECN99-734