

POWER MANAGEMENT

Description

The EZ1083 is a high performance positive voltage regulator designed for use in applications requiring low dropout performance at 7.5A. Additionally, the EZ1083 series provides excellent regulation over variations in line, load and temperature.

Features include 1.4V dropout at 7.5 amps, fast transient response, internal current limiting and thermal shutdown protection of the output device. The EZ1083 has both fixed and adjustable voltage options. These devices are available in the popular TO-220 package.

The EZ1083 is used in industrial systems to provide power to microprocessors and chipsets. It is also used to power ASICs in control systems for medical applications.

Features

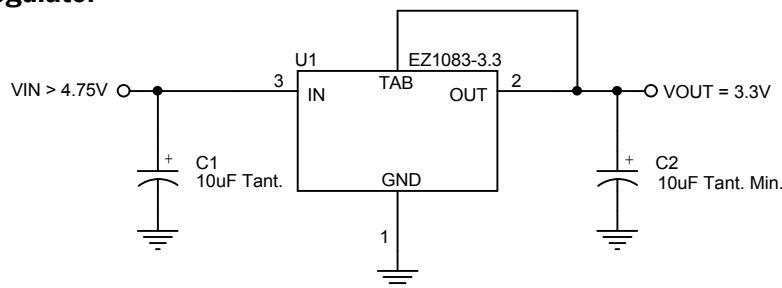
- ◆ Low dropout performance: 1.4V max. for EZ1083
- ◆ Full current rating over line and temperature
- ◆ Fast transient response
- ◆ Adjust pin current max 90µA over temperature
- ◆ Fixed/adjustable output voltage (EZ1083)
- ◆ Line regulation typically 0.015%
- ◆ Load regulation typically 0.05%
- ◆ ±2% total output regulation over line, load and temperature
- ◆ TO-220 package. Available in WEEE and RoHS compliant package

Applications

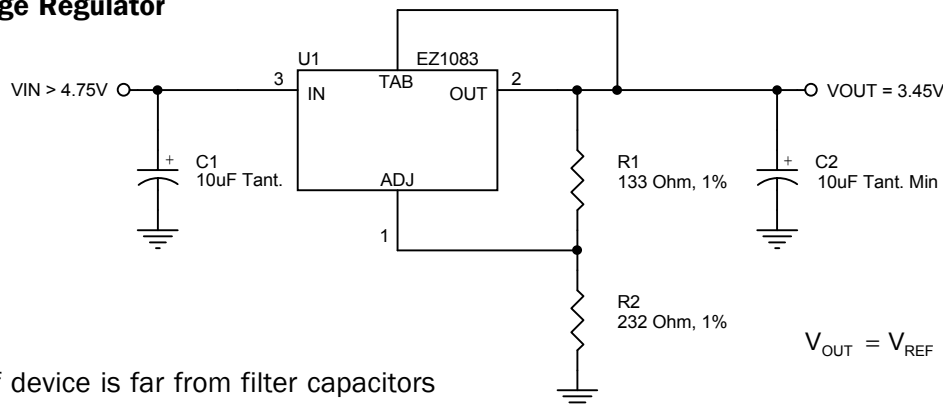
- ◆ PC Motherboards
- ◆ Microcontroller systems
- ◆ Medical equipment
- ◆ Low power microprocessor systems
- ◆ Post regulation for switching power supplies
- ◆ Telecommunication systems

Typical Application Circuit

Fixed Voltage Regulator



Adjustable Voltage Regulator



Notes:

- (1) C1 needed if device is far from filter capacitors
- (2) C2 minimum value required for stability

$$V_{OUT} = V_{REF} \cdot \left(1 + \frac{R2}{R1}\right) + I_{ADJ} \cdot R2$$

POWER MANAGEMENT
Absolute Maximum Ratings

Exceeding the specifications below may result in permanent damage to the device, or device malfunction. Operation outside of the parameters specified in the Electrical Characteristics section is not implied.

| Parameter | Symbol | Maximum | Units |
|--|---------------|--------------------|-------|
| Input Supply Voltage | V_{IN} | 7 | V |
| Power Dissipation | P_D | Internally Limited | W |
| Thermal Resistance Junction to Case | θ_{JC} | 1.6 | °C/W |
| Thermal Resistance Junction to Ambient | θ_{JA} | 50 | °C/W |
| Operating Junction Temperature Range | T_J | 0 to 125 | °C |
| Storage Temperature Range | T_{STG} | -65 to 150 | °C |
| Lead Temperature (Soldering) 10 Sec. | T_{LEAD} | 300 | °C |

Electrical Characteristics

Unless otherwise specified: Adj. V_{IN} = 2.75V to 7.0V and Adj. I_o = 10mA to 7.5A; Fixed V_{IN} = 4.75 to 7.0V and Fixed I_o = 0 mA to 7.5A

| Parameter | Symbol | V_{IN} | I_o | $T_J^{(5)}$ | Min | Typ | Max | Units |
|--|----------------|----------|-------|-------------|-------------|-------|-------------|-------|
| Output Voltage ⁽¹⁾ | V_o | 5V | 0mA | 25°C | 0.985 V_o | V_o | 1.015 V_o | V |
| EZ1083-X.X | | | | O.T. | 0.98 V_o | V_o | 1.02 V_o | |
| Reference Voltage ⁽¹⁾ | V_{REF} | 5V | 10mA | 25°C | 1.231 | 1.250 | 1.269 | V |
| EZ1083 | | | | O.T. | 1.225 | 1.250 | 1.275 | |
| Line Regulation | $REG_{(LINE)}$ | | 10mA | 25°C | | 0.015 | 0.2 | % |
| | | | | O.T. | | 0.035 | 0.2 | |
| Load Regulation ⁽¹⁾ | $REG_{(LOAD)}$ | 5V | | 25°C | | 0.05 | 0.3 | % |
| | | | | O.T. | | 0.2 | 0.4 | |
| Dropout Voltage ⁽²⁾ | V_D | | | 25°C | | 1 | | V |
| EZ1083, EZ1083-X.X | | | | O.T. | | 1.20 | 1.40 | |
| Current Limit | I_{CL} | | | O.T. | 7.5 | 9.5 | | A |
| Quiescent Current Fixed Voltage Version | I_Q | 5V | | O.T. | | 12 | 14 | mA |
| Temperature Coefficient | T_C | | | O.T. | | 0.005 | | %/°C |

POWER MANAGEMENT
Electrical Characteristics (Cont.)

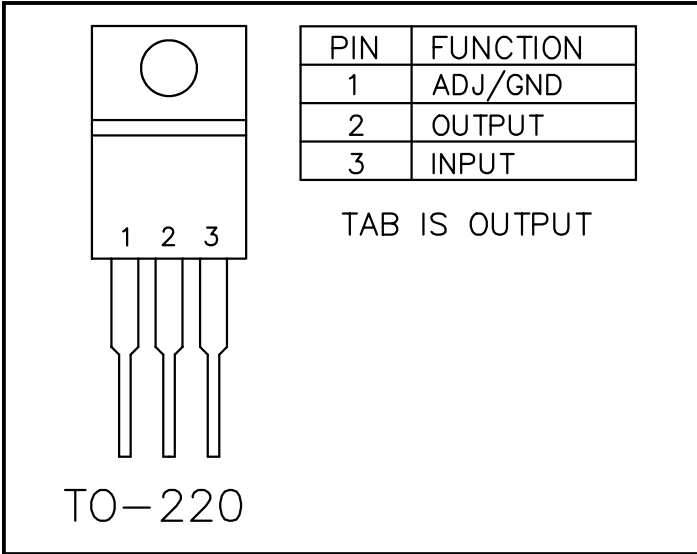
| Parameter | Symbol | V _{IN} | I _o | T _J ⁽⁵⁾ | Min | Typ | Max | Units |
|--|-------------------|-----------------|----------------|-------------------------------|-----|-------|-----|-----------------|
| Adjust Pin Current | I _{ADJ} | | | 25°C | | 55 | | μA |
| | | | | O.T. | | | 90 | |
| Adjust Pin Current Change | ΔI _{ADJ} | | | O.T. | | 0.2 | 5 | μA |
| Temperature Stability | T _S | 5V | 0.5A | O.T. | | 0.5 | | % |
| Minimum Load Current Adj Voltage Version | I _o | 5V | | O.T. | | 5 | 10 | mA |
| RMS Output Noise ⁽³⁾ | V _N | | | 25°C | | 0.003 | | %V _o |
| Ripple Rejection Ratio ⁽⁴⁾ | R _A | 5V | 7.5A | 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.

POWER MANAGEMENT

Pin Configuration



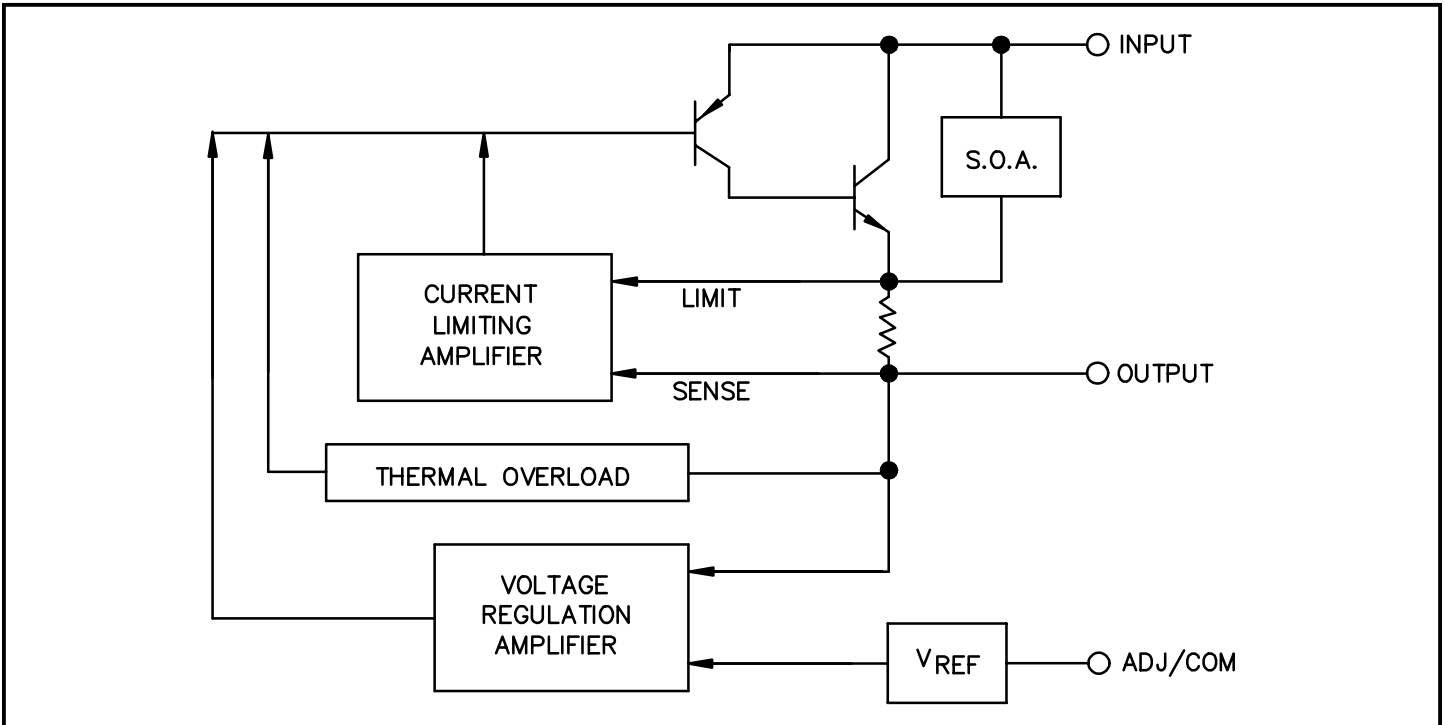
Ordering Information

| Device | Package ⁽³⁾ | V _{OUT} Volts ⁽²⁾ |
|------------------------------|------------------------|---------------------------------------|
| EZ1083CT-X.X ⁽¹⁾ | TO-220 | Fixed and Adjustable |
| EZ1083CT-X.XT ⁽⁴⁾ | | |

Notes:

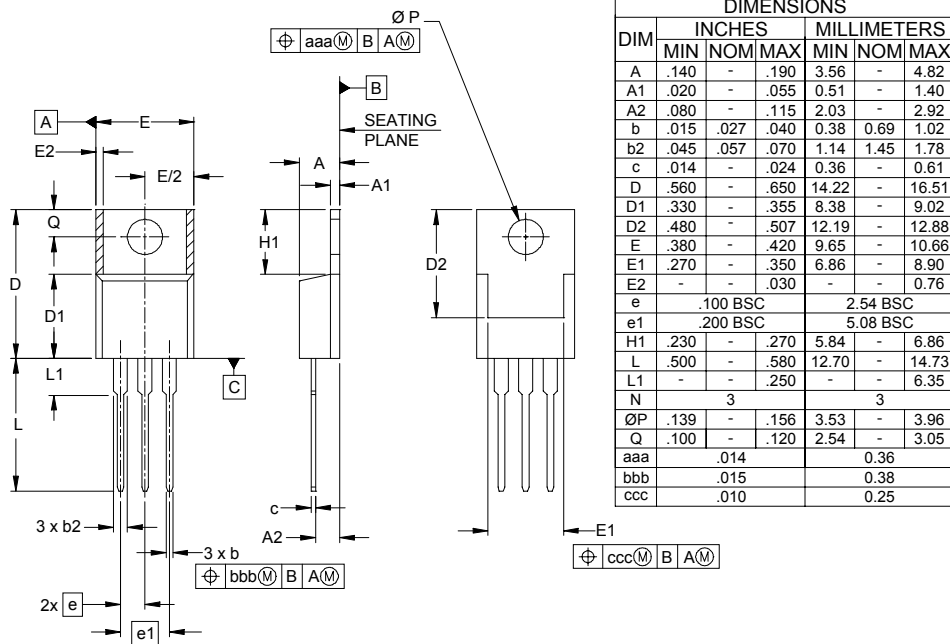
- (1) Where X.X denotes voltage options. Available voltages are: 2.5V and 3.3V. Leave blank for adjustable version. Contact factory for additional voltage options.
- (2) Adjustable versions: output adjusts from 1.3V to 5.7V.
- (3) Only available in tube packaging. A tube contains 50 devices.
- (4) This product is fully WEEE and RoHS compliant.

Block Diagram



POWER MANAGEMENT

Outline Drawing - TO-220



- NOTES:
1. CONTROLLING DIMENSIONS ARE IN INCHES.
 2. DIMENSIONS "D" AND "E" DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

Contact Information

Semtech Corporation
 Power Management Products Division
 200 Flynn Road, Camarillo, CA 93012
 Phone: (805)498-2111 FAX (805)498-3804