

### POWER MANAGEMENT

#### Description

The EZ1584 is a high performance positive voltage regulator designed for use in applications requiring low dropout performance at 7A. 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 is an excellent choice for powering microprocessor systems. Using an LDO eliminates MOSFETs and inductors, saving both space and cost. An LDO also provides better transient response and no ripple.

A variety of options are available for maximum flexibility: the EZ1584C is intended for commercial applications and has both fixed and adjustable voltage options; the EZ1584I is intended for industrial applications and has a 3.3V fixed and an adjustable option. All devices are available in the popular TO-220 package.

#### Features

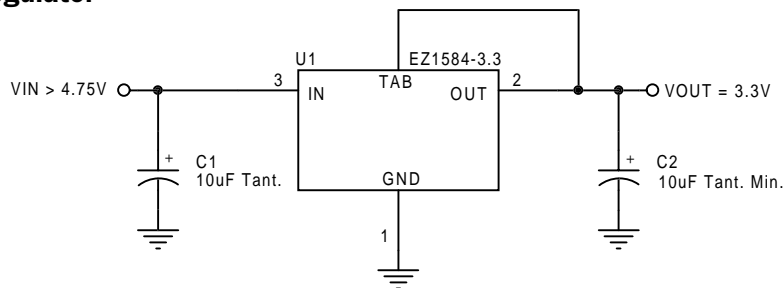
- ◆ Low dropout performance: 1.3V max. for EZ1584C and 1.4V max. for EZ1584I
- ◆ Full current rating over line and temperature
- ◆ Fast transient response
- ◆ ±2% total output regulation over line, load and temperature
- ◆ Adjust pin current max 90µA over temperature
- ◆ Fixed/adjustable output voltage
- ◆ Line regulation typically 0.015%
- ◆ Load regulation typically 0.05%
- ◆ Industrial temperature range (EZ1584I)
- ◆ TO-220 package

#### Applications

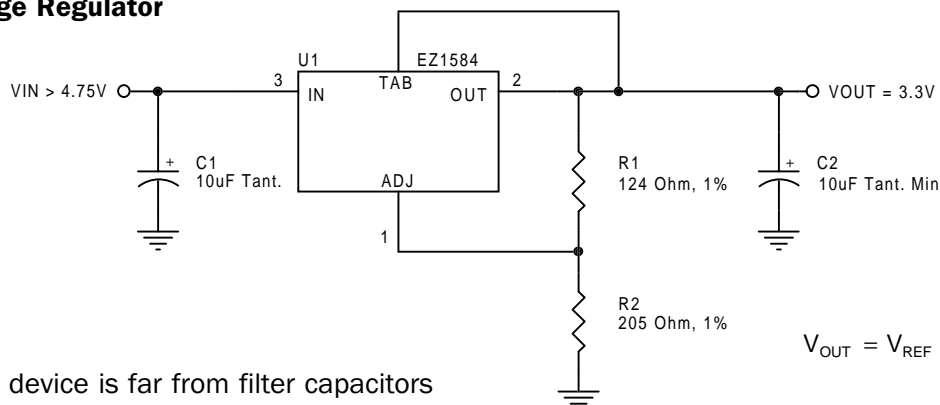
- ◆ Memory supply
- ◆ Graphics core supply
- ◆ Other 2.5V to 3.6V microprocessor supplies
- ◆ Low voltage logic supplies
- ◆ Battery-powered circuitry
- ◆ Post regulator for switching supply
- ◆ Telecom supplies
- ◆ Industrial supplies

#### 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

Parameter	Symbol	Maximum	Units
Input Supply Voltage	$V_{IN}$	7	V
Power Dissipation	$P_D$	Internally Limited	W
Thermal Resistance Junction to Case	$\theta_{JC}$	2	°C/W
Thermal Resistance Junction to Ambient	$\theta_{JA}$	50	°C/W
Operating Ambient Temperature Range EZ1584C EZ1584I	$T_A$	0 to 70 -40 to 85	°C
Operating Junction Temperature Range EZ1584C EZ1584I	$T_J$	0 to 125 -40 to 125	°C
Storage Temperature Range	$T_{STG}$	-65 to 150	°C
Lead Temperature (Soldering) 10 Sec.	$T_{LEAD}$	300	°C
ESD Rating (Human Body Model)	ESD	2	kV

### 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  $7.0A$ .  
Values in **bold** apply over full operating ambient temperature range.

Parameter	Symbol	$V_{IN}$	$I_O$	Min	Typ	Max	Units
Output Voltage <sup>(1)</sup> EZ1584C-X.X, EZ1584I-3.3	$V_O$	5V	0mA	0.99 $V_O$	$V_O$	1.01 $V_O$	V
				<b>0.98<math>V_O</math></b>		<b>1.02<math>V_O</math></b>	
Reference Voltage <sup>(1)</sup> EZ1584C, EZ1584I	$V_{REF}$	5V	10mA	1.238	1.250	1.262	V
				<b>1.225</b>		<b>1.275</b>	
Line Regulation <sup>(1)</sup>	$REG_{(LINE)}$		10mA		0.015	<b>0.2</b>	%
Load Regulation <sup>(1)</sup>	$REG_{(LOAD)}$	5V			0.05	<b>0.4</b>	%
Dropout Voltage <sup>(1)(2)</sup> EZ1584C, EZ1584C-X.X EZ1584I, EZ1584I-3.3	$V_D$		7A		1.20	<b>1.30</b>	V
					1.20	<b>1.40</b>	
Current Limit	$I_{CL}$			<b>7.1</b>	9.0		A

**POWER MANAGEMENT**
**Electrical Characteristics (Cont.)**

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  $7.0A$ .  
 Values in **bold** apply over full operating ambient temperature range.

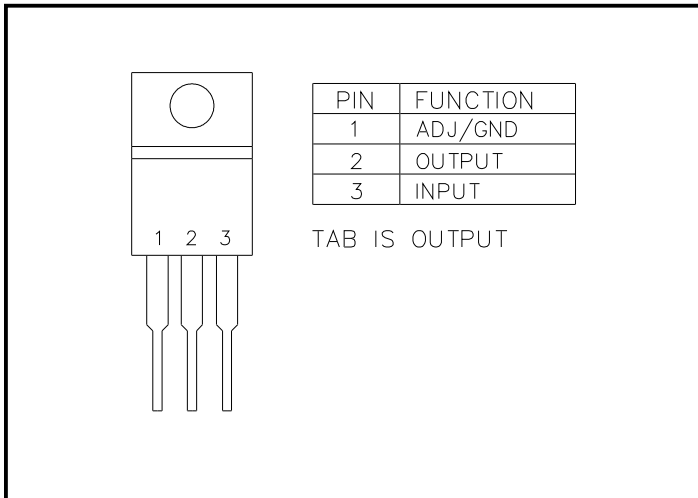
Parameter	Symbol	$V_{IN}$	$I_O$	Min	Typ	Max	Units
Quiescent Current Fixed Voltage Versions	$I_Q$	5V			10	<b>13</b>	mA
Temperature Coefficient	$T_C$				0.005		%/°C
Adjust Pin Current	$I_{ADJ}$				55	<b>90</b>	$\mu A$
Adjust Pin Current Change	$\Delta I_{ADJ}$				0.2	<b>5</b>	$\mu A$
Temperature Stability	$T_S$	5V	0.5A		<b>0.5</b>		%
Minimum Load Current Adj Voltage Versions	$I_O$	5V			5	<b>10</b>	mA
RMS Output Noise <sup>(3)</sup>	$V_N$				0.003		% $V_O$
Ripple Rejection Ratio <sup>(4)</sup>	$R_A$	5V	7A	<b>60</b>	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 =  $25\mu F$ ).

## POWER MANAGEMENT

### Pin Configuration



### Ordering Information

Device <sup>(1)(2)</sup>	Package
EZ1584CT-X.X EZ1584IT-X.X	TO-220 <sup>(3)</sup>

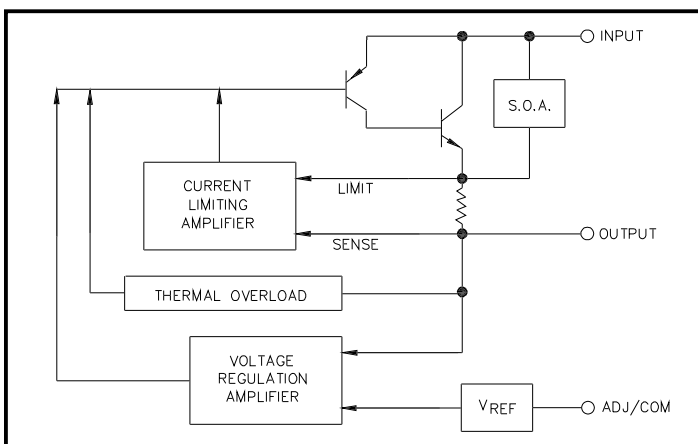
#### Notes:

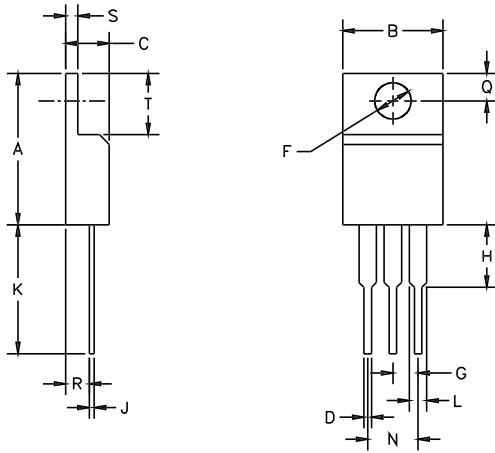
- (1) Where X.X denotes voltage options. Available voltages are: 1.5V, 2.5V and 3.3V for EZ1584C and 3.3V only for EZ1584I. Leave blank for adjustable version (1.3V to 5.7V). Contact factory for additional voltage options.
- (2) Where C and I denote Commercial (0°C to 70°C) and Industrial (-40°C to 85°C) ambient temperature ranges.
- (3) Only available in tube packaging. A tube contains 50 devices.

### Pin Descriptions

Pin	Pin Name	Pin Function
1	ADJUST	This pin is the negative side of the reference voltage for adjustable devices. Transient response can be improved by adding a small bypass capacitor from the adjust pin to ground.
	GROUND	This pin is the bottom end of the internal resistor feedback chain for fixed output voltage parts, and should be connected to ground.
2	OUTPUT	This is the power output of the device and is electrically connected to the TAB.
3	INPUT	This is the input supply pin for both the control circuitry and the pass device.

### Block Diagram



**POWER MANAGEMENT**
**Outline Drawing - TO-220**


DIM <sup>N</sup>	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	.560	.650	14.23	16.51	
B	.380	.420	9.66	10.66	
C	.140	.190	3.56	4.82	
D	.020	.045	0.51	1.14	
F	.139	.161	3.54	4.08	
G	.090	.110	2.29	2.79	
H	—	.250	—	6.35	
J	.012	.045	.31	1.14	
K	.500	.580	12.70	14.73	
L	.045	.070	1.15	1.77	
N	.190	.210	4.83	5.33	
Q	.100	.135	2.54	3.42	
R	.080	.115	2.04	2.92	
S	.020	.055	.51	1.39	
T	.230	.270	5.85	6.85	

JEDEC TO-220

**Contact Information**

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