

### POWER MANAGEMENT

#### Description

The EZ1082 is a high performance positive voltage regulator designed for use in applications requiring low dropout performance at 10A. Additionally, the EZ1082 provides excellent regulation over variations in line, load and temperature.

Features include 1.4V dropout at 10A, fast transient response, internal current limiting and thermal shutdown protection of the output device. The EZ1082 series are three terminal regulators with fixed and adjustable voltage options available in the popular TO-220 package.

The EZ1082 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 with no ripple to the load.

#### Features

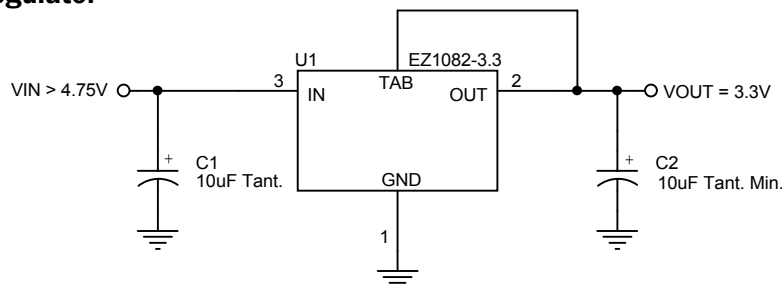
- ◆ Low dropout performance, 1.4V max.
- ◆ Full current rating over line and temperature
- ◆ Fast transient response
- ◆  $\pm 2\%$  total output regulation over line, load and temperature
- ◆ Adjust pin current max 90 $\mu$ A over temperature
- ◆ Fixed/adjustable output voltage
- ◆ Line regulation typically 0.015%
- ◆ Load regulation typically 0.05%
- ◆ TO-220 3 pin package. Available in Pb-free plating, RoHS compliant

#### Applications

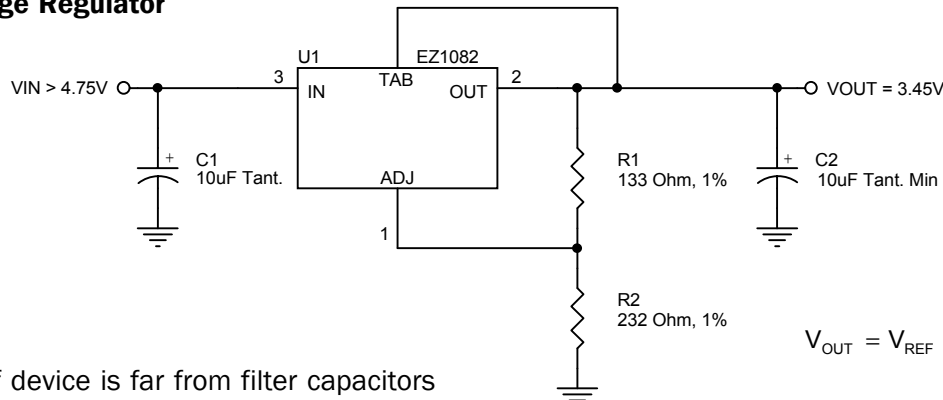
- ◆ High current microprocessor supplies
- ◆ Post regulators
- ◆ Microprocessor systems
- ◆ Medical equipment
- ◆ Embedded systems
- ◆ Post regulation for switching supplies
- ◆ Telecommunication systems

#### Typical Application Circuit

##### Fixed Voltage Regulator



##### Adjustable Voltage Regulator



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

#### Notes:

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

**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	$\theta_{JC}$	3	°C/W
Thermal Resistance Junction to Ambient	$\theta_{JA}$	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  $10.0A$ ; Fixed  $V_{IN} = 4.75$  to  $7.0V$  and Fixed  $I_O = 0$  mA to  $10.0A$

Parameter	Symbol	$V_{IN}$	$I_O$	$T_J^{(4)}$	Min	Typ	Max	Units
Output Voltage <sup>(1)</sup>	$V_O$	5V	0mA	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>	$REG_{(LINE)}$		10mA	25°C		0.015	0.2	%
				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	$V_D$			25°C		1.2		V
$\Delta V_{OUT}, \Delta V_{REF} = 1\%$				O.T.		1.2	1.4	
Current Limit	$I_{CL}$			O.T.	10.0	12		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.)**

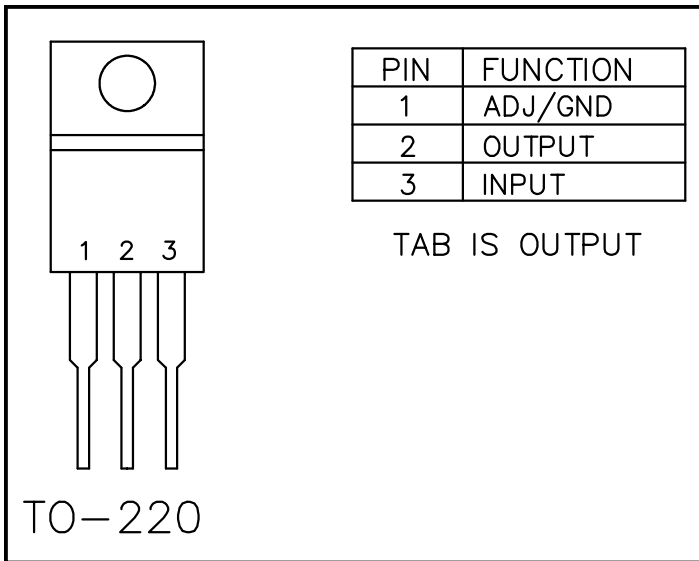
Parameter	Symbol	$V_{IN}$	$I_O$	$T_J^{(4)}$	Min	Typ	Max	Units
Adjust Pin Current	$I_{ADJ}$			25°C		55		$\mu A$
				O.T.			90	
Adjust Pin Current Change	$\Delta I_{ADJ}$			O.T.		0.2	5	$\mu A$
Temperature Stability	$T_S$	5V	0.5A	O.T.		0.5		%
Minimum Load Current Adj Voltage Version	$I_O$	5V		O.T.		5	10	mA
RMS Output Noise <sup>(2)</sup>	$V_N$			25°C		0.003		% $V_O$
Ripple Rejection Ratio <sup>(3)</sup>	$R_A$	5V	10.0A	O.T.	60	72		dB

**NOTES:**

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

**POWER MANAGEMENT**

**Pin Configuration**



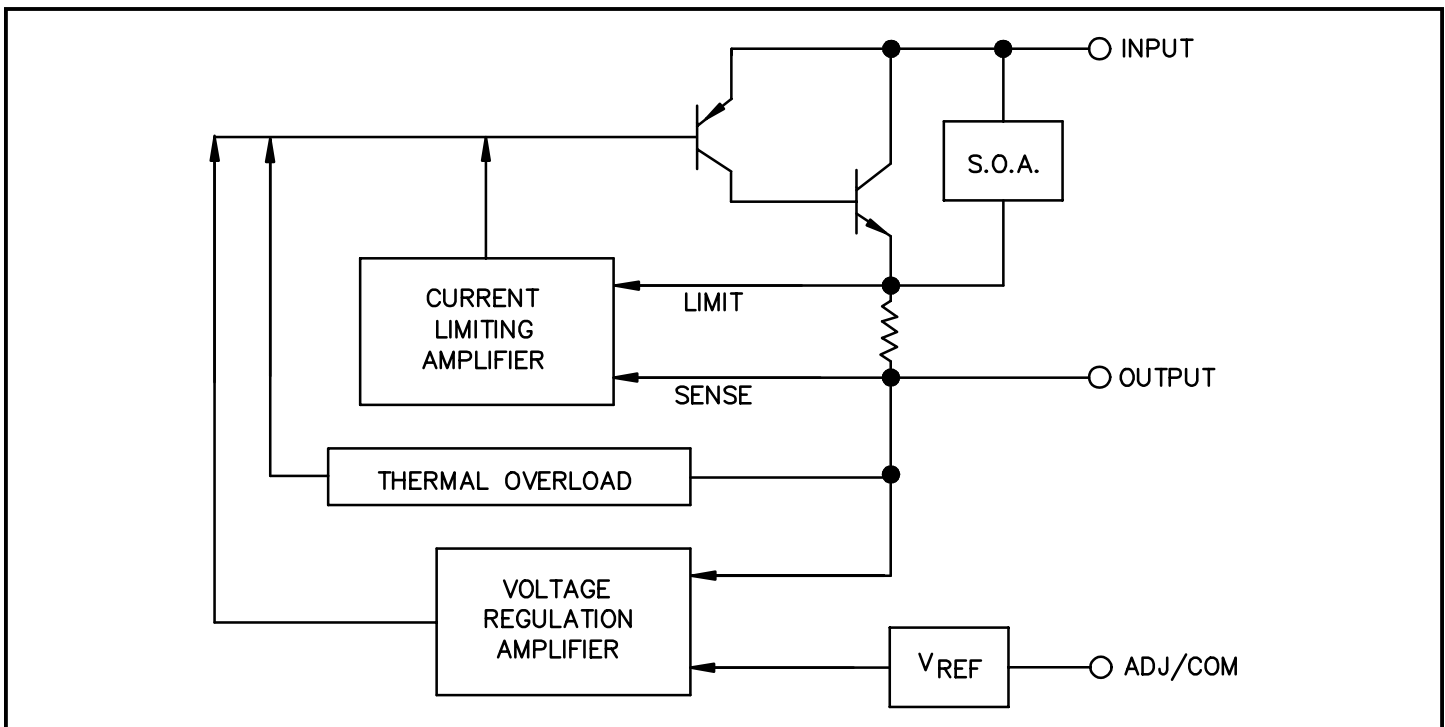
**Ordering Information**

Device <sup>(1)(2)</sup>	Package <sup>(3)</sup>
EZ1082CT-X.XT	TO-220

**Notes:**

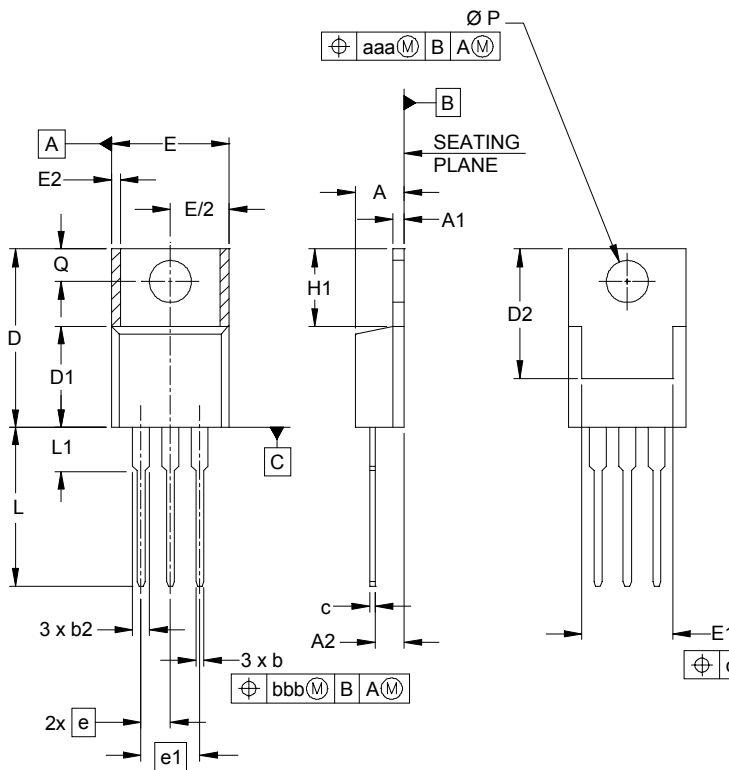
- (1) Where X.X denotes voltage options. Available voltages are: 2.5V and 3.3V. Leave blank for adjustable version (1.3 to 5.7V). Contact factory for additional voltage options.
- (2) Only available in tube packaging. A tube contains 50 devices.
- (3) Available in Pb-free plating, RoHS compliant.

**Block Diagram**



**POWER MANAGEMENT**

**Outline Drawing - TO-220**



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.140	-	.190	3.56	-	4.82
A1	.020	-	.055	0.51	-	1.40
A2	.080	-	.115	2.03	-	2.92
b	.015	.027	.040	0.38	0.69	1.02
b2	.045	.057	.070	1.14	1.45	1.78
c	.014	-	.024	0.36	-	0.61
D	.560	-	.650	14.22	-	16.51
D1	.330	-	.355	8.38	-	9.02
D2	.480	-	.507	12.19	-	12.88
E	.380	-	.420	9.65	-	10.66
E1	.270	-	.350	6.86	-	8.90
E2	-	-	.030	-	-	0.76
e	.100 BSC			2.54 BSC		
e1	.200 BSC			5.08 BSC		
H1	.230	-	.270	5.84	-	6.86
L	.500	-	.580	12.70	-	14.73
L1	-	-	.250	-	-	6.35
N	3			3		
ØP	.139	-	.156	3.53	-	3.96
Q	.100	-	.120	2.54	-	3.05
aaa	.014			0.36		
bbb	.015			0.38		
ccc	.010			0.25		

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