

April 7, 1998

TEL:805-498-2111 FAX:805-498-3804 WEB: <http://www.semtech.com>

DESCRIPTION

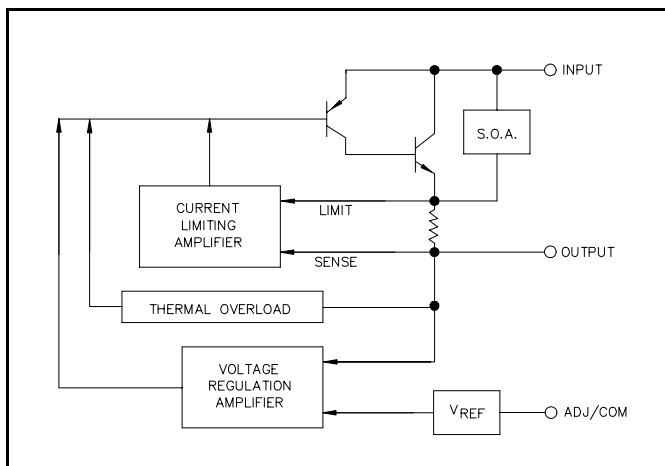
The EZ1588 series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current. Additionally, the EZ1588 series provides excellent regulation over variations in line, load and temperature.

Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The EZ1588 series are three terminal regulators with fixed and adjustable voltage options available in popular packages.

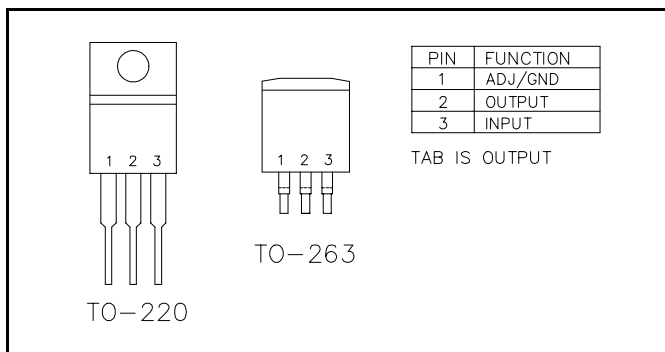
APPLICATIONS

- 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 CONFIGURATIONS



FEATURES

- Low dropout performance, 1.3V max. for EZ1588
- 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 μ A over temperature
- Fixed/adjustable output voltage
- Line regulation typically 0.005%
- Load regulation typically 0.05%
- TO-220 or TO-263 packages

ORDERING INFORMATION

DEVICE	PACKAGE	V _{OUT} VOLTS
EZ1588CT-X.X	TO-220	See Note (1)
EZ1588CM-X.X	TO-263 ⁽²⁾	See Note (1)

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) Add suffix 'TR' for tape and reel (TO-263).

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	θ_{JC}	3 3	°C/W
Thermal Resistance Junction to Ambient	θ_{JA}	50 60	°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}	260	°C

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ELECTRICAL CHARACTERISTICS

Unless otherwise specified, Adj $V_{IN} = 2.75$ to $7.0V$ and ADJ $I_O = 10mA$ to $2.0A$;
 Fixed $V_{IN} = 4.75$ to $7.0V$ and Fixed $I_O = 0mA$ to $2.0A$

Parameter	Symbol	Test Conditions			Test Limits			Units
		V_{IN}	I_O	$T_J^{(5)}$	Min	Typ	Max	
Output Voltage ⁽¹⁾	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 ⁽¹⁾	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 ⁽¹⁾	$REG_{(LINE)}$			25°C		0.005	0.2	%
Fixed Voltage Version			0mA	O.T.		0.035	0.2	
Adj Voltage Version			10mA					
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
				O.T.		1.1	1.3	
Current Limit	I_{CL}			O.T.	2.0	2.5		A
Quiescent Current Fixed Voltage Version	I_Q	5V		O.T.		10	13	mA
Temperature Coefficient	T_C			O.T.		0.004	0.02	%/°C
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	2.0A	O.T.	60	72		dB

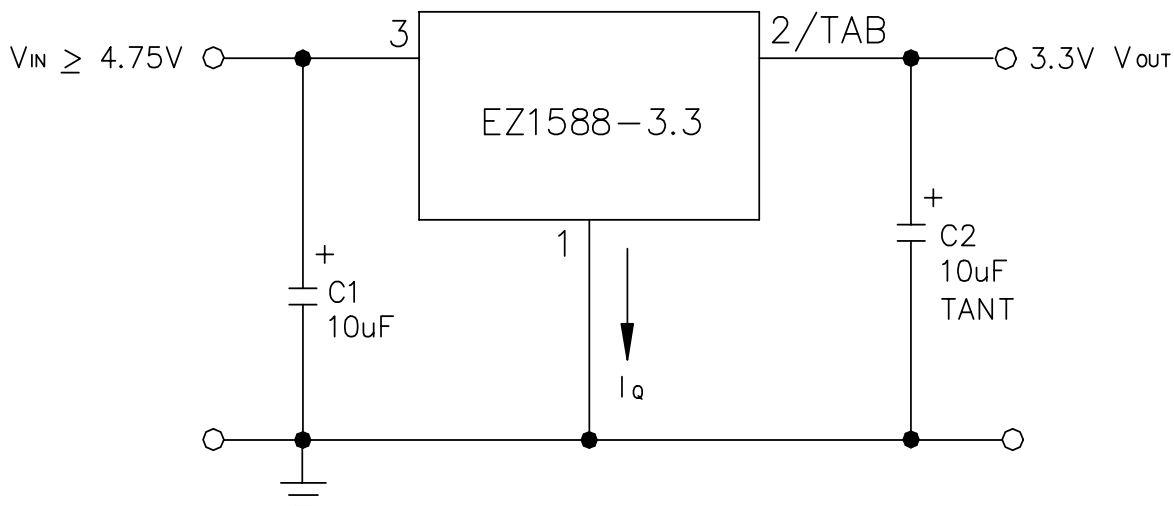
NOTES:

- (1) Low duty cycle pulse testing with Kelvin connections required.
- (2) ΔV_{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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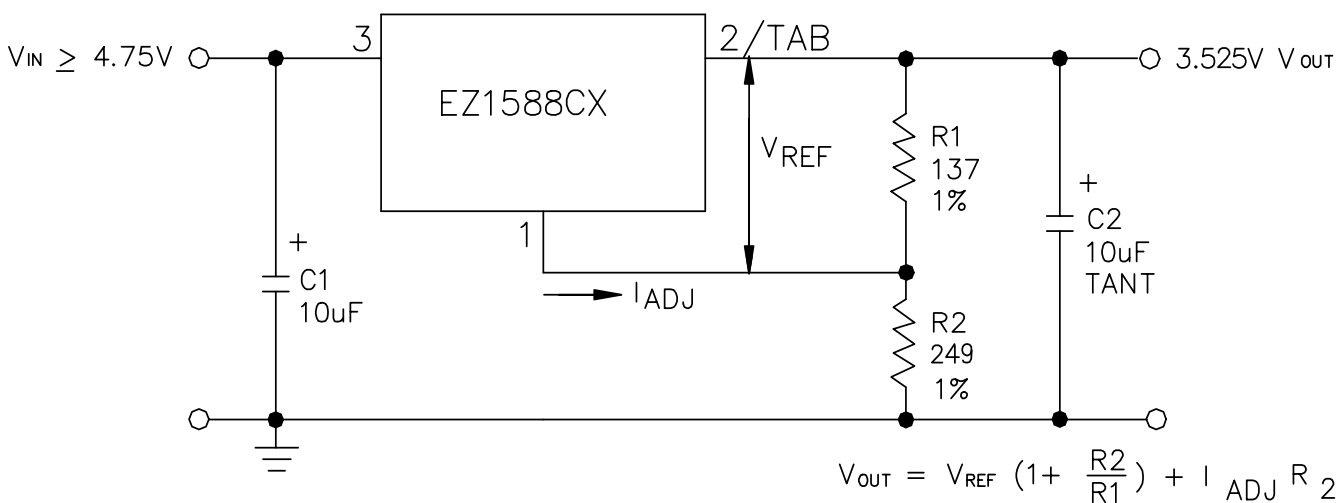
TYPICAL APPLICATIONS

FIXED VOLTAGE REGULATOR ⁽¹⁾⁽²⁾



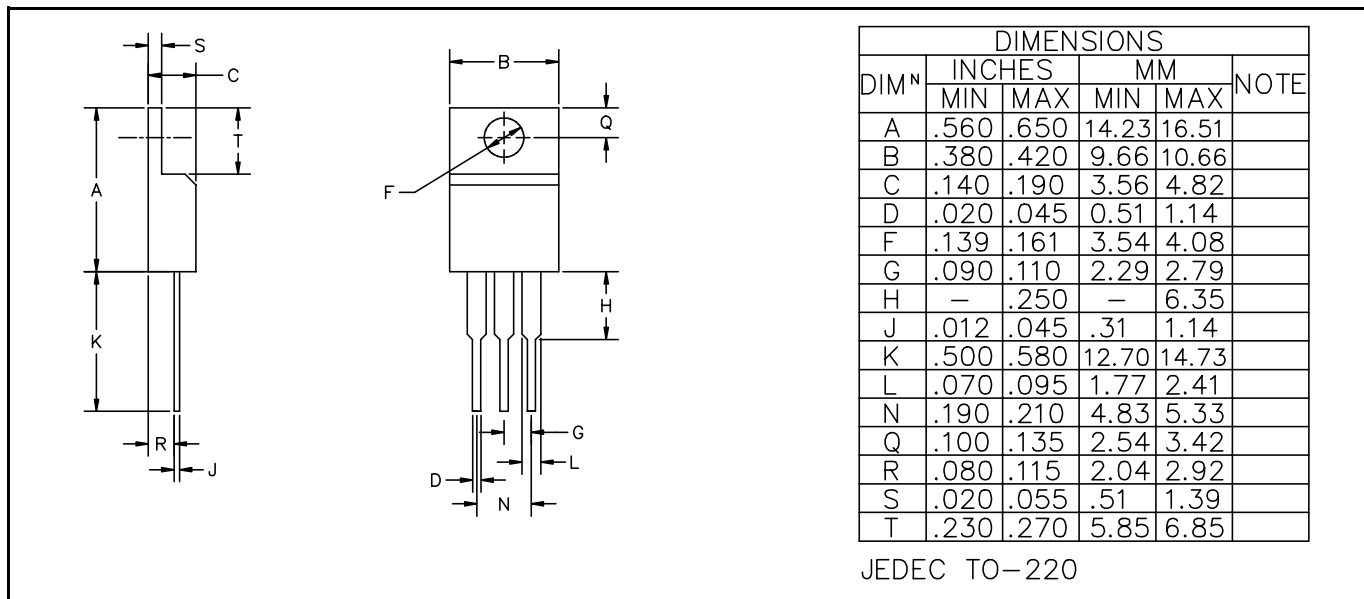
- (1) $C1$ NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.
 (2) $C2$ REQUIRED FOR STABILITY.

ADJUSTABLE VOLTAGE REGULATOR ⁽¹⁾⁽²⁾



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

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DEVICE OUTLINE - TO-220

DEVICE OUTLINE - TO-263
