November 22, 1999

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

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.

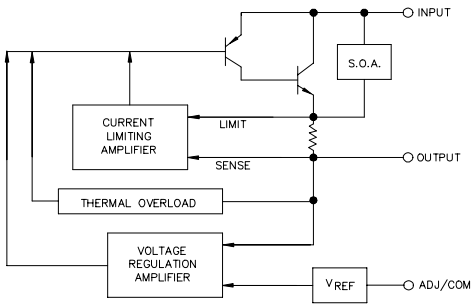
FEATURES

- Low dropout performance, 1.3V max. for EZ1584
- 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%
- TO-220 package

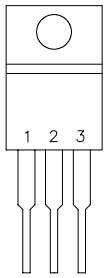
APPLICATIONS

- 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



TO−220

PIN	FUNCTION
1	ADJ/GND
2	OUTPUT
3	INPUT

TAB IS OUTPUT

ORDERING INFORMATION

DEVICE	PACKAGE	V_{OUT} 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_{IN}	7	V
Power Dissipation	P_D	Internally Limited	W
Thermal Resistance Junction to Case TO-220	θ_{JC}	2	°C/W
Thermal Resistance Junction to Ambient TO-220	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}	260	°C

Pentium Processor is a trademark of Intel Corp. PowerPC is a trademark of IBM Corp.

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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

		Test Conditions			Test Limits			
Parameter	**Symbol**	**V_{IN}**	**I_O**	**T_J (5)**	**Min**	**Typ**	**Max**	**Units**
Output Voltage (1)	V_O	5V	10mA	25°C	$0.99V_O$	V_O	$1.01V_O$	V
Fixed Voltage Version				O.T.	$0.98V_O$	V_O	$1.02V_O$	
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		0.015	0.2	%
Fixed Voltage Version			0mA	O.T.		0.035	0.2	
Adj Voltage Version			10mA	O.T.		0.035	0.2	
Load Regulation (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
EZ1584				O.T.		1.1	1.3	
Current Limit	I_{CL}			O.T.	7.1	9.0		A
Quiescent Current Fixed Voltage Version	I_Q	5V		O.T.		10	13	mA
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	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	7.0A	O.T.	60	72		dB

NOTES:
(1) Low duty cycle pulse testing with Kelvin connections required.
(2) ΔV_{OUT}, ΔV_{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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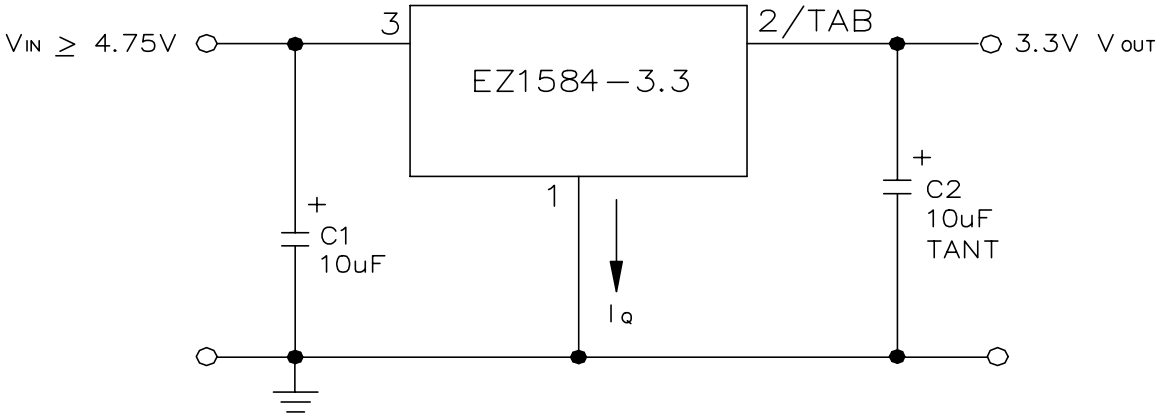
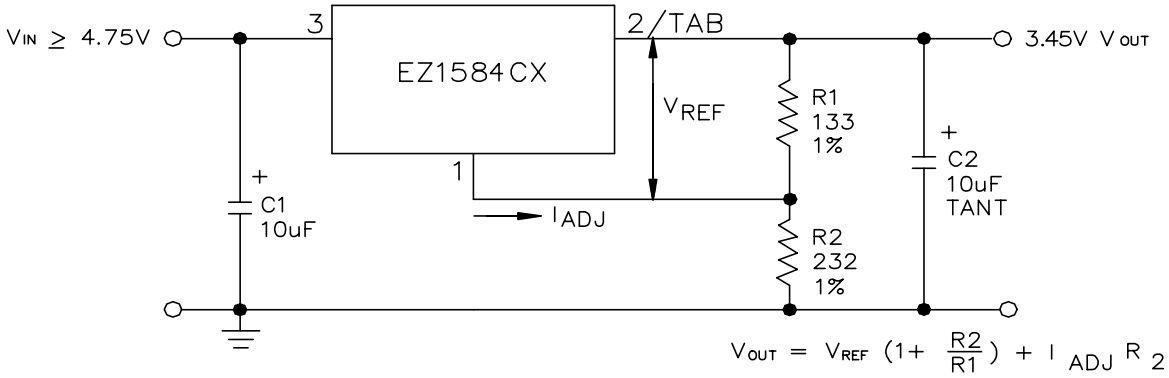
TYPICAL APPLICATIONS

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]



$$V_{OUT} = V_{REF}\left(1+\frac{R2}{R1}\right) + I_{ADJ} R_2$$

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

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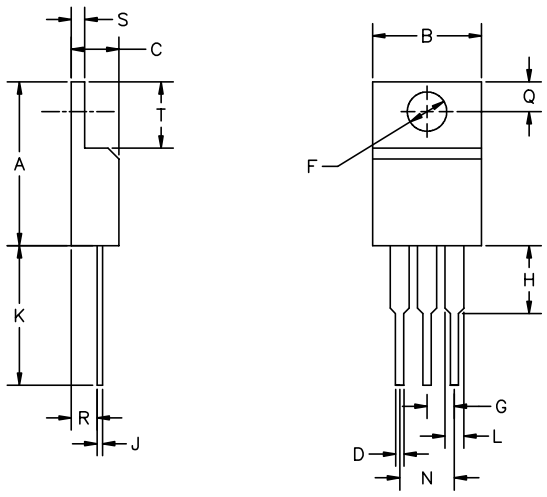
DEVICE OUTLINE - TO-220



DIMENSIONS					
DIMN	INCHES		MM		NOTE
	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	.070	.095	1.77	2.41	
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

ECN99-734

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