

November 22, 1999

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

DESCRIPTION

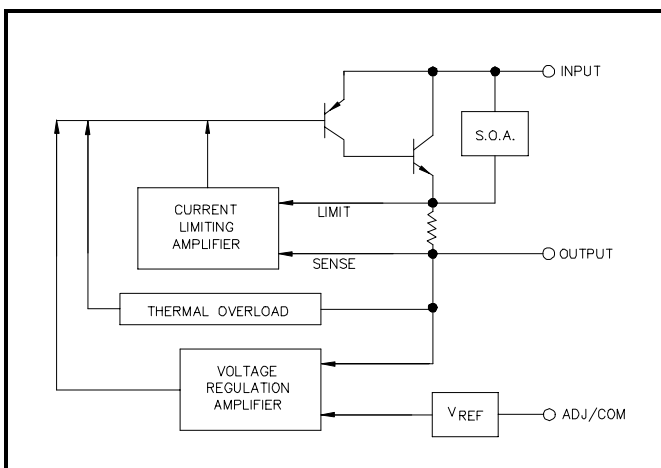
The EZ1587 series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current. Additionally, the EZ1587 series provides excellent regulation over variations in line, load and temperature.

Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The EZ1587 series are three terminal regulators with fixed and adjustable voltage options available in popular packages.

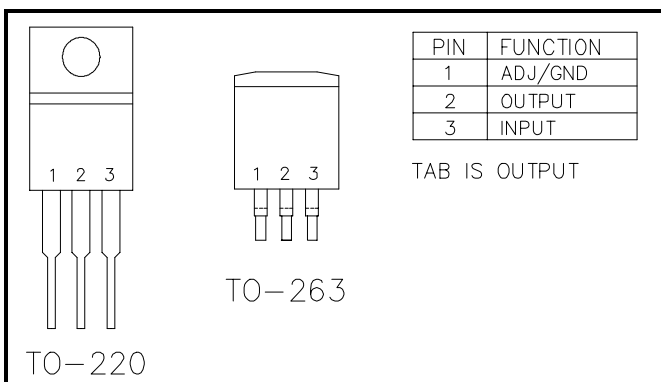
APPLICATIONS

- Pentium® Processor supplies
- PowerPC™ supplies
- Other 1.3V to 5.7V 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 EZ1587
- 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
EZ1587CT-X.X	TO-220	See Note (1)
EZ1587CM-X.X	TO-263 ⁽²⁾	See Note (1)

Notes:

(1) Where X.X denotes voltage options. Available voltages are: 1.5V, 1.8V, 2.5V, 3.3V and 3.45V. 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 TO-220 TO-263	θ_{JC}	3 3	°C/W
Thermal Resistance Junction to Ambient TO-220 TO-263	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

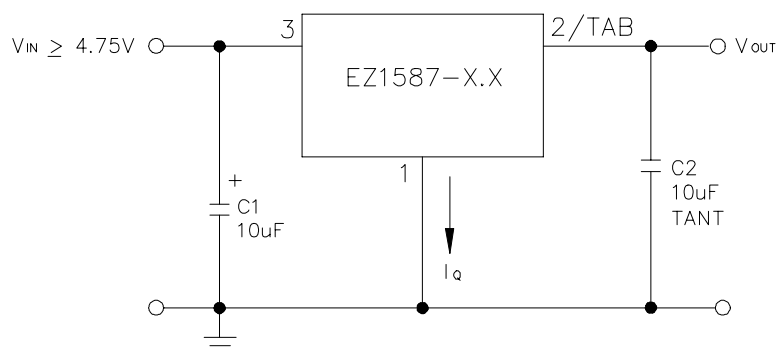
 Unless otherwise specified, Adj $V_{IN} = 2.75$ to $7.0V$ and ADJ $I_O = 10mA$ to $3.0A$;
 Fixed ($V_{OUT} + 1.5$) to $7.0V$ and Fixed $I_O = 0mA$ to $3.0A$

		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	0.99 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
EZ1587				O.T.		1.1	1.3	
Current Limit	I_{CL}			O.T.	3.1	4.5		A
Quiescent Current	I_Q	5V		O.T.		10	13	mA
Fixed Voltage Version								
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	I_O	5V		O.T.		5	10	mA
Adj Voltage Version								
RMS Output Noise ⁽³⁾	V_N			25°C		0.003		% V_O
Ripple Rejection Ratio ⁽⁴⁾	R_A	5V	3.0A	O.T.	60	72		dB

NOTES:

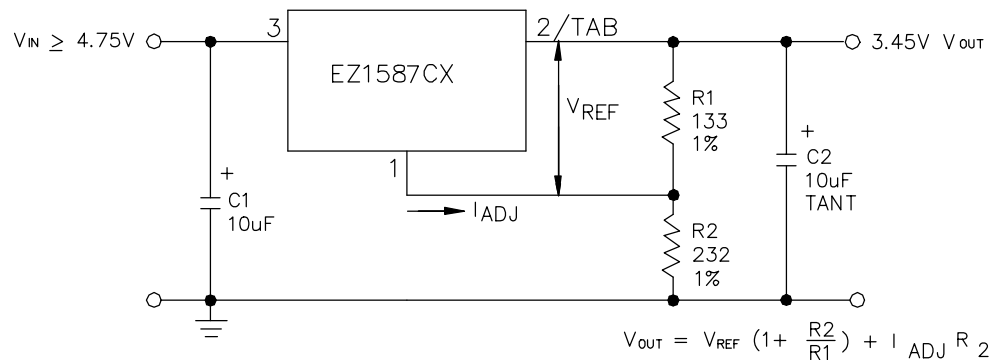
- (1) Low duty cycle pulse testing with Kelvin connections required.
- (2) $\Delta V_{OUT}, \Delta V_{REF} = 1\%$
- (3) Bandwidth of 10 Hz to 10 kHz.
- (4) 120 Hz input ripple, (C_{ADJ} for ADJ = 25μF).
- (5) Over Temp. (O.T.) = over specified operating junction temperature range.

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TYPICAL APPLICATIONS
FIXED VOLTAGE REGULATOR ⁽¹⁾⁽²⁾


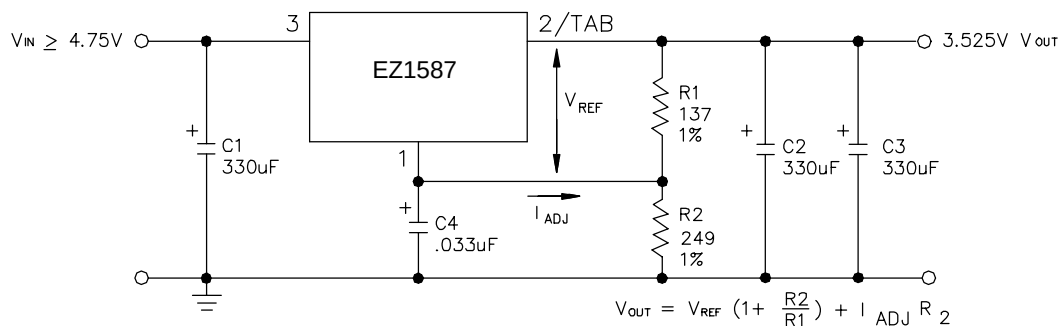
(1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.

(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.

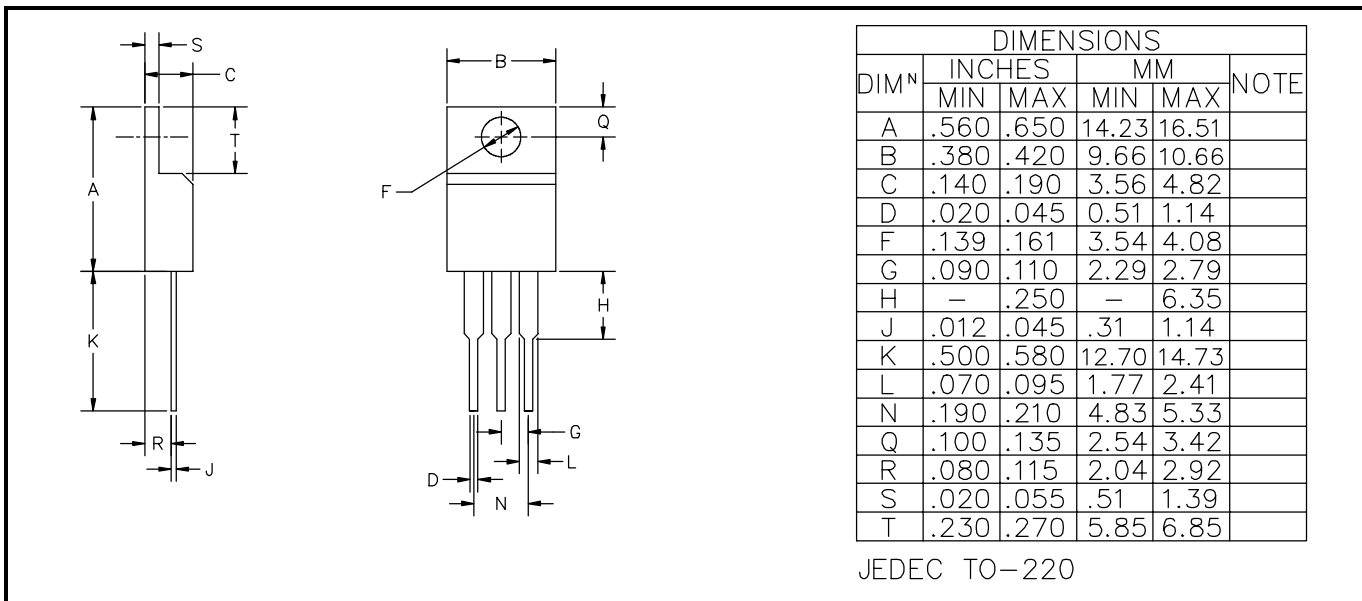
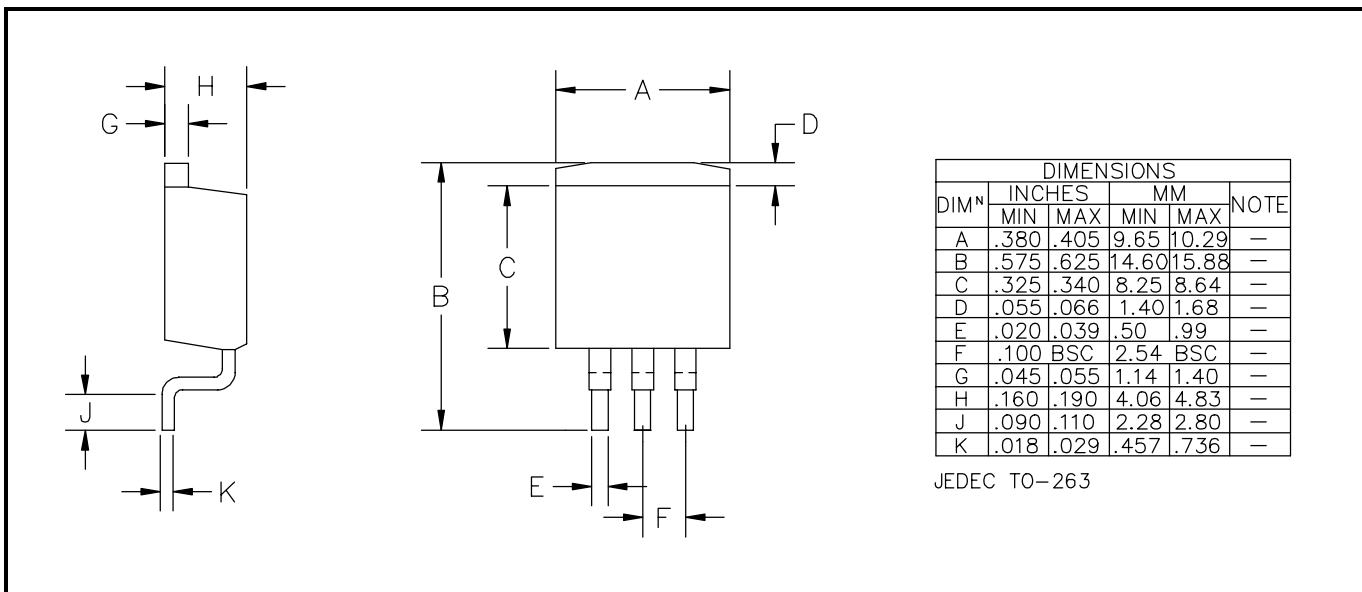
**RECOMMENDED CIRCUIT FOR THE INTEL
PENTIUM PROCESSOR® - P54C-VRE**


(1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.

(2) C2 AND C3 REQUIRED FOR STABILITY.

(3) C1 = C2 = C3 = 330uF, 200m OHM ESR

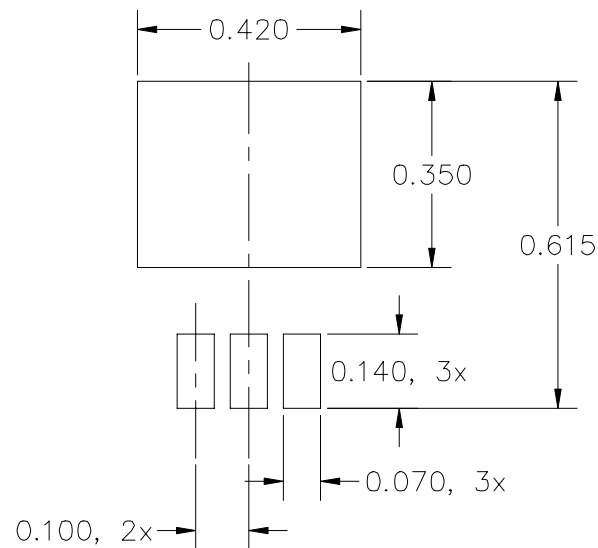
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DEVICE OUTLINE - TO-220

DEVICE OUTLINE - TO-263


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LAND PATTERN - TO-263

MINIMUM RECOMMENDED FOOTPRINT FOR
TO-263-3



NOTE: ALL DIMENSIONS ARE IN INCHES

ECN99-734