EZ1587C & EZ1587I
3 Amp Positive Voltage Regulator

POWER MANAGEMENT

Description

The EZ1587 series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at up to 3A. 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.

A variety of options are available for maximum flexibility: the EZ1587C is intended for commercial applications and has both fixed and adjustable voltage options; the EZ1587I is intended for industrial applications and is adjustable only.

All devices are available in the popular TO-220 and TO-263 packages.

Features

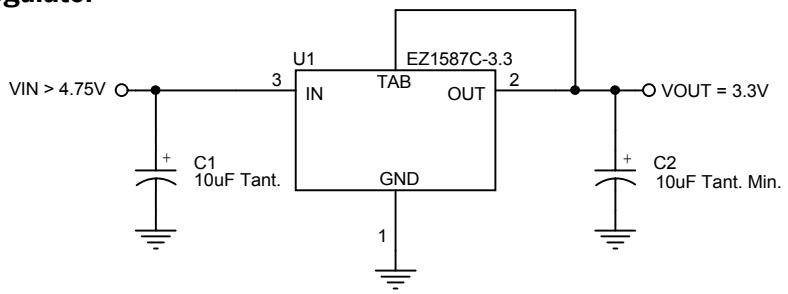
- Low dropout voltage: 1.3V max. for EZ1587C and 1.4V max. for EZ1587I
- Full current rating over line and temperature
- Fast transient response
- ±2% total output regulation over line, load and temperature
- Adjust pin current max 90µA over temperature
- Fixed/adjustable output voltage (EZ1587C)
- Line regulation typically 0.015%
- Load regulation typically 0.05%
- Industrial temperature range (EZ1587I)
- TO-220 and TO-263 packages. Available in RoHS compliant package

Applications

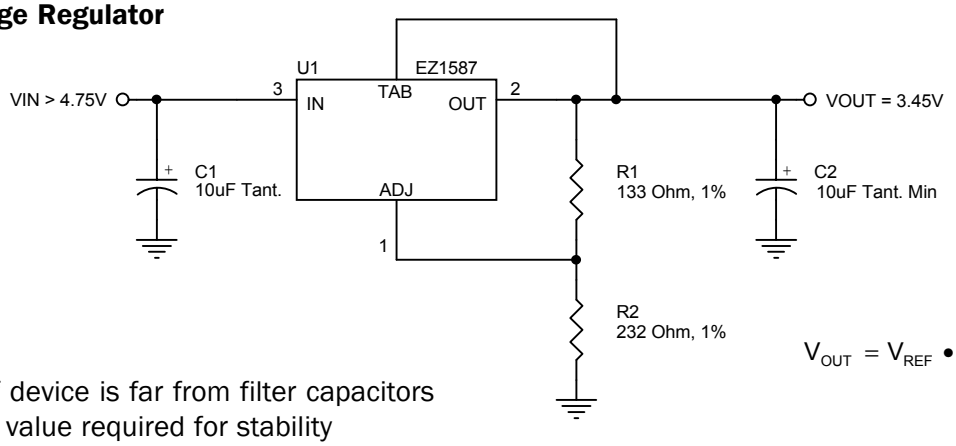
- Printer and plotter supplies
- Instrumentation
- Medical equipment
- Microcontroller systems
- Telecommunication systems
- Motherboards
- Switching supply post regulation

Typical Application Circuit

Fixed Voltage Regulator



Adjustable Voltage Regulator



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

Notes:

(1) C1 needed if device is far from filter capacitors

(2) C2 minimum value required for stability

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 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 Ambient Temperature Range EZ1587C EZ1587I	T_A	 0 to 70 -40 to 85	°C
Operating Junction Temperature Range EZ1587C EZ1587I	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 3A; Fixed V_{IN} = 4.75 to 7.0V and Fixed I_O = 0 mA to 3A.
Values in **bold** apply over full operating ambient temperature range.

Parameter	Symbol	V_{IN}	I_O	Min	Typ	Max	Units
Output Voltage (1)	V_O	5V	0mA	$0.985V_O$	V_O	$1.015V_O$	V
EZ1587C-X.X				**$0.98V_O$**		**$1.02V_O$**	
Reference Voltage (1)	V_{REF}	5V	10mA	1.231	1.250	1.269	V
EZ1587C, EZ1587I				**1.225**		**1.275**	
Line Regulation (1)	$REG_{(LINE)}$		10mA		0.015	**0.2**	%
Load Regulation (1)	$REG_{(LOAD)}$	5V			0.05	**0.4**	%
Dropout Voltage(1)(2) EZ1587C, EZ1587C-X.X	V_D		3.0A		1.20	**1.35**	V
EZ1587I					1.20	**1.40**	
Current Limit	I_{CL}			**3.1**	4.5		A

Electrical Characteristics (Cont)

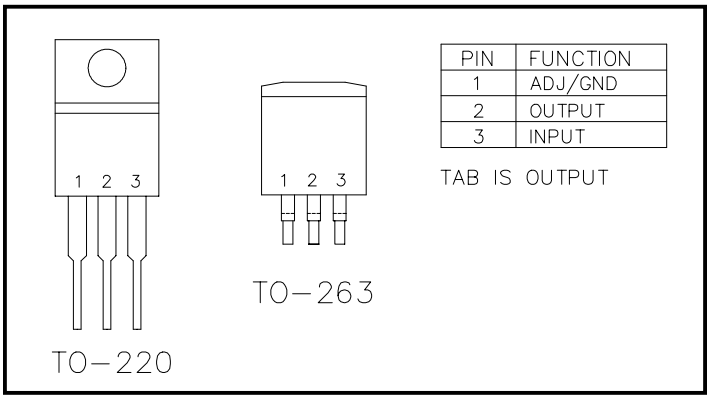
Unless otherwise specified: Adj. V_{IN} = 2.75V to 7.0V and Adj. I_O = 10mA to 3A; Fixed V_{IN} = 4.75 to 7.0V and Fixed I_O = 0 mA to 3A.
Values in **bold** apply over full operating ambient temperature range.

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

Pin Configurations



PIN	FUNCTION
1	ADJ/GND
2	OUTPUT
3	INPUT

TAB IS OUTPUT

Ordering Information

Device[1][2]	Package
EZ1587CM-X.X.TR EZ1587IM.TR EZ1587CM-X.X.TRT[5] EZ1587IM.TRT[5]	TO-263[3]
EZ1587CT-X.X EZ1587IT EZ1587CT-X.XT[5] EZ1587ITT[5]	TO-220[4]

Notes:

(1) Where X.X denotes voltage options (EZ1587C only). Available voltages are: 1.5V, 1.8V, 2.5V,and 3.3V. Leave blank for adjustable version (1.3 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 tape and reel packaging. A reel contains 800 devices.

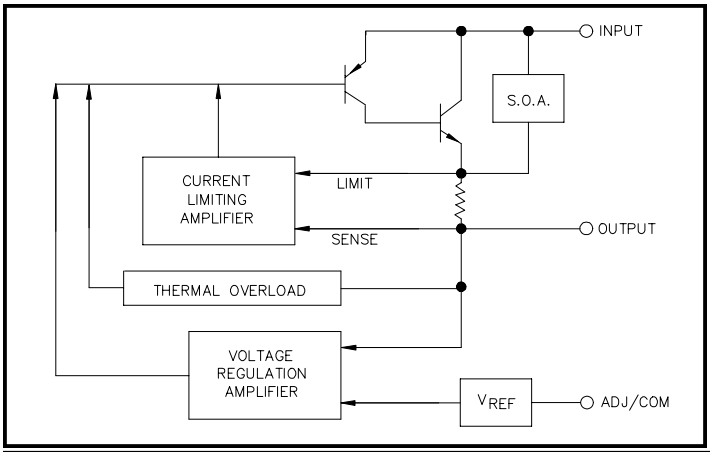
(4) Only available in tube packaging. A tube contains 50 devices.

(5) This product is RoHS compliant.

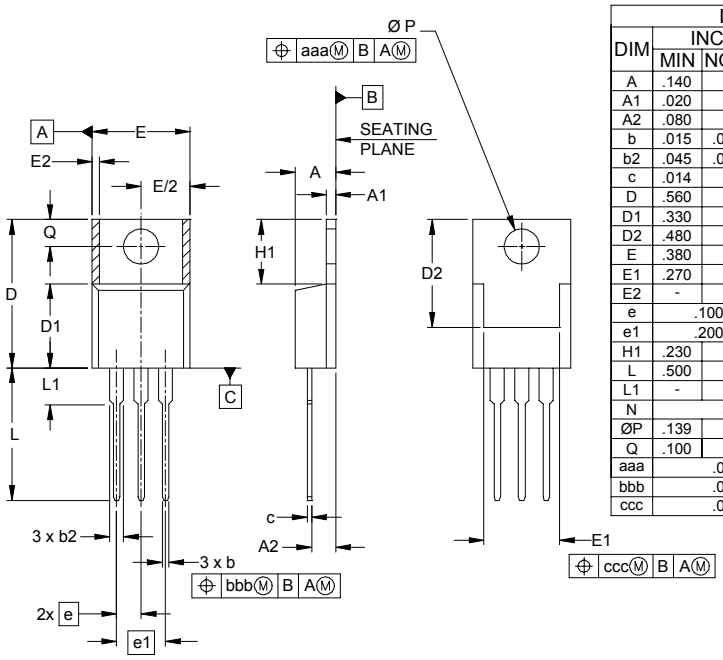
Pin Descriptions

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



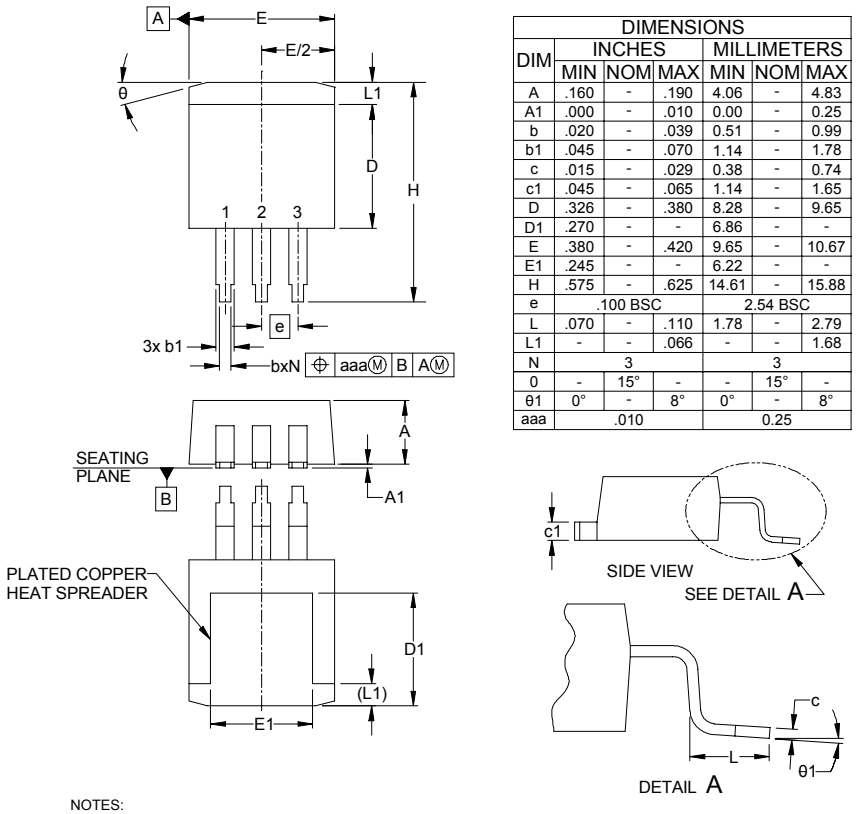
Outline Drawing - T0-220



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.

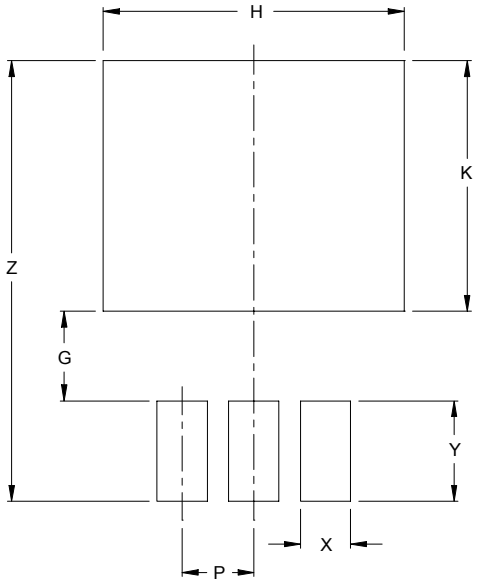
Outline Drawing - T0-263



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.160	-	.190	4.06	-	4.83
A1	.000	-	.010	0.00	-	0.25
b	.020	-	.039	0.51	-	0.99
b1	.045	-	.070	1.14	-	1.78
c	.015	-	.029	0.38	-	0.74
c1	.045	-	.065	1.14	-	1.65
D	.326	-	.380	8.28	-	9.65
D1	.270	-	-	6.86	-	-
E	.380	-	.420	9.65	-	10.67
E1	.245	-	-	6.22	-	-
H	.575	-	.625	14.61	-	15.88
e	.100 BSC			2.54 BSC		
L	.070	-	.110	1.78	-	2.79
L1	-	-	.066	-	-	1.68
N	3			3		
0	-	15°	-	-	15°	-
θ1	0°	-	8°	0°	-	8°
aaa	.010			0.25		

NOTES:
1. CONTROLLING DIMENSIONS ARE IN INCHES (ANGLES IN DEGREES).
2. DIMENSIONS "D" AND "E" DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

Land Pattern - TO-263



DIMENSIONS		
DIM	INCHES	MILLIMETERS
G	.125	3.17
H	.420	10.67
K	.350	8.89
P	.100	2.54
X	.070	1.78
Y	.140	3.56
Z	.615	15.62

NOTES:

1. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

Contact Information

Semtech Corporation
Power Management Products Division
200 Flynn Road, Camarillo, CA 93012
Phone: (805)498-2111 FAX (805)498-3804