

POWER MANAGEMENT

Description

The EZ1585 series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at up to 4.6A. Additionally, the EZ1585 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 EZ1585C is intended for commercial applications and has both fixed and adjustable voltage options; the EZ1585I is intended for industrial applications and is adjustable only.

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

Features

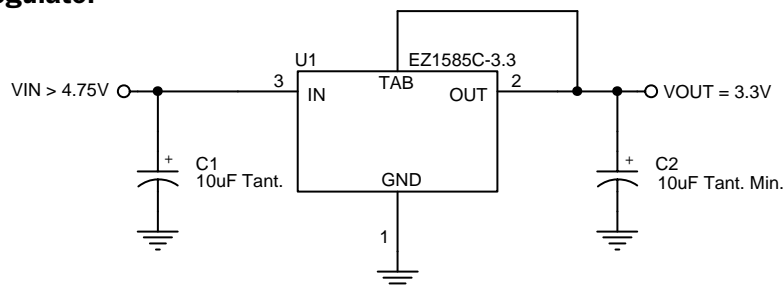
- ◆ Low dropout voltage: 1.3V max. for EZ1585C and 1.4V max. for EZ1585I
- ◆ Full current rating over line and temperature
- ◆ Fast transient response
- ◆ ±2% total output regulation over line, load and temperature
- ◆ Adjust pin current max 90µA over temperature
- ◆ Fixed/adjustable output voltage (EZ1585C)
- ◆ Line regulation typically 0.015%
- ◆ Load regulation typically 0.05%
- ◆ Industrial temperature range (EZ1585I)
- ◆ TO-220 and TO-263 packages

Applications

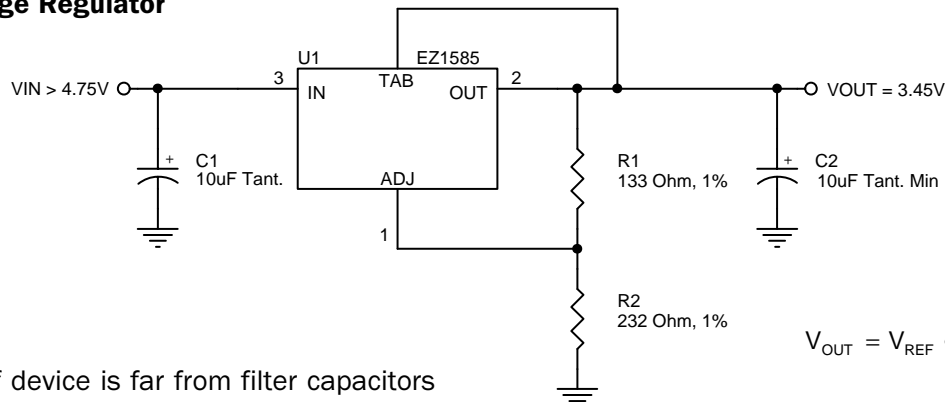
- ◆ Printer and plotter supplies
- ◆ Instrumentation
- ◆ Medical equipment
- ◆ Microcontroller systems
- ◆ Telecommunication systems
- ◆ Motherboards
- ◆ Switching supply post regulation

Typical Application Circuit

Fixed Voltage Regulator



Adjustable Voltage Regulator



Notes:

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

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

POWER MANAGEMENT

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	$^{\circ}C/W$
Thermal Resistance Junction to Ambient TO-220 TO-263	θ_{JA}	50 60	$^{\circ}C/W$
Operating Ambient Temperature Range EZ1585C EZ1585I	T_A	0 to 70 -40 to 85	$^{\circ}C$
Operating Junction Temperature Range EZ1585C EZ1585I	T_J	0 to 125 -40 to 125	$^{\circ}C$
Storage Temperature Range	T_{STG}	-65 to 150	$^{\circ}C$
Lead Temperature (Soldering) 10 Sec.	T_{LEAD}	300	$^{\circ}C$
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 $4.6A$; Fixed $V_{IN} = 4.75$ to $7.0V$ and Fixed $I_O = 0$ mA to $4.6A$.
Values in **bold** apply over full operating ambient temperature range.

Parameter	Symbol	V_{IN}	I_O	Min	Typ	Max	Units
Output Voltage ⁽¹⁾ EZ1585C-X.X	V_O	5V	0mA	$0.99V_O$ $0.98V_O$	V_O	$1.01V_O$ $1.02V_O$	V
Reference Voltage ⁽¹⁾ EZ1585C, EZ1585I	V_{REF}	5V	10mA	1.238 1.225	1.250	1.262 1.275	V
Line Regulation ⁽¹⁾	$REG_{(LINE)}$		10mA		0.015	0.2	%
Load Regulation ⁽¹⁾	$REG_{(LOAD)}$	5V			0.05	0.4	%
Dropout Voltage ⁽¹⁾⁽²⁾ EZ1585C, EZ1585C-X.X EZ1585I	V_D		4.6A		1.20 1.20	1.30 1.40	V
Current Limit	I_{CL}			4.7	7.5		A

POWER MANAGEMENT
Electrical Characteristics (Cont)

Unless otherwise specified: Adj. $V_{IN} = 2.75V$ to $7.0V$ and Adj. $I_O = 10mA$ to $4.6A$; Fixed $V_{IN} = 4.75$ to $7.0V$ and Fixed $I_O = 0$ mA to $4.6A$.
 Values in **bold** apply over full operating ambient temperature range.

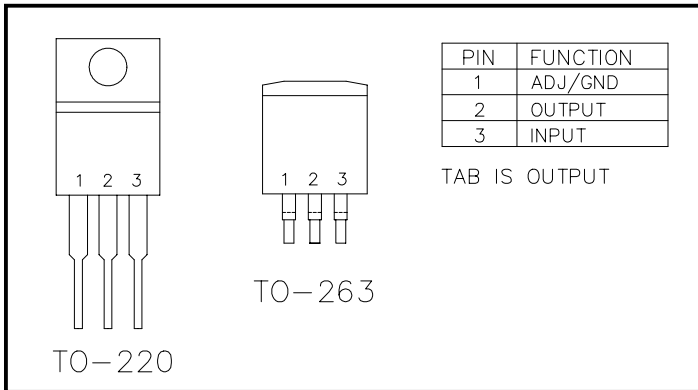
Parameter	Symbol	V_{IN}	I_O	Min	Typ	Max	Units
Quiescent Current Fixed Voltage Version	I_Q	5V			10	13	mA
Temperature Coefficient	T_C				0.005		%/°C
Adjust Pin Current	I_{ADJ}				55	90	μA
Adjust Pin Current Change	ΔI_{ADJ}				0.2	5	μA
Temperature Stability	T_S	5V	0.5A		0.5		%
Minimum Load Current Adj Voltage Versions	I_O	5V			5	10	mA
RMS Output Noise ⁽³⁾	V_N				0.003		% V_O
Ripple Rejection Ratio ⁽⁴⁾	R_A	5V	4.6A	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 = $25\mu F$).

POWER MANAGEMENT

Pin Configurations



Ordering Information

Device ⁽¹⁾⁽²⁾	Package
EZ1585CM-X.X.TR EZ1585IM.TR	TO-263 ⁽³⁾
EZ1585CT-X.X EZ1585IT	TO-220 ⁽⁴⁾

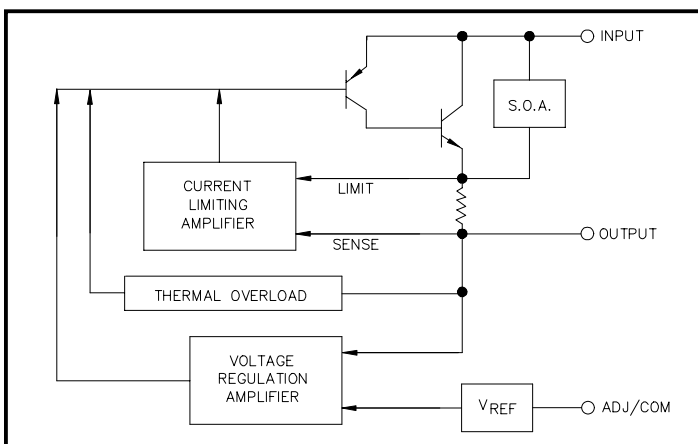
Notes:

- (1) Where X.X denotes voltage options (EZ1585C only). Available voltages are: 1.5V, 2.5V, 3.3V and 3.45V. 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.

Pin Descriptions

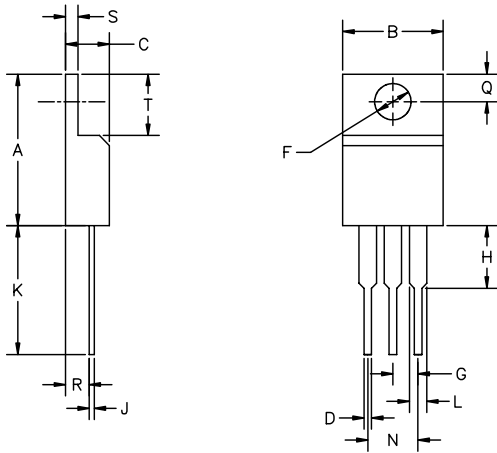
Pin	Pin Name	Pin Function
1	ADJUST	This pin is the negative side of the reference voltage for adjustable devices. Transient response can be improved by adding a small bypass capacitor from the adjust pin to ground.
	GROUND	This pin is the bottom end of the internal resistor feedback chain for fixed output 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



POWER MANAGEMENT

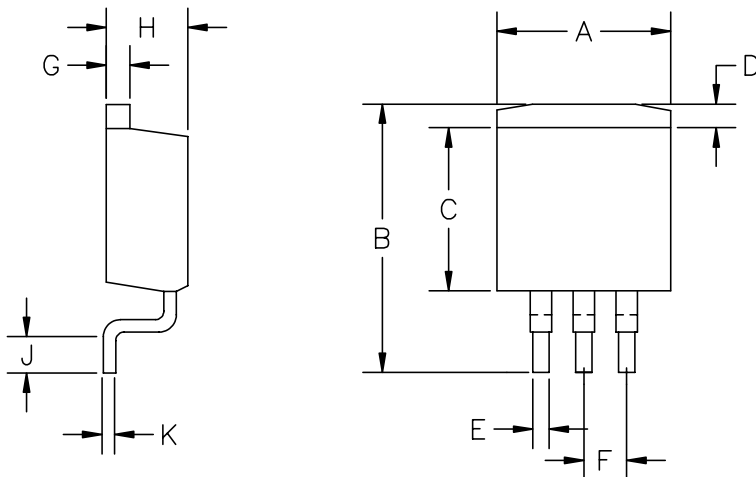
Outline Drawing - TO-220



DIM ^N	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	.045	.070	1.15	1.77	
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	

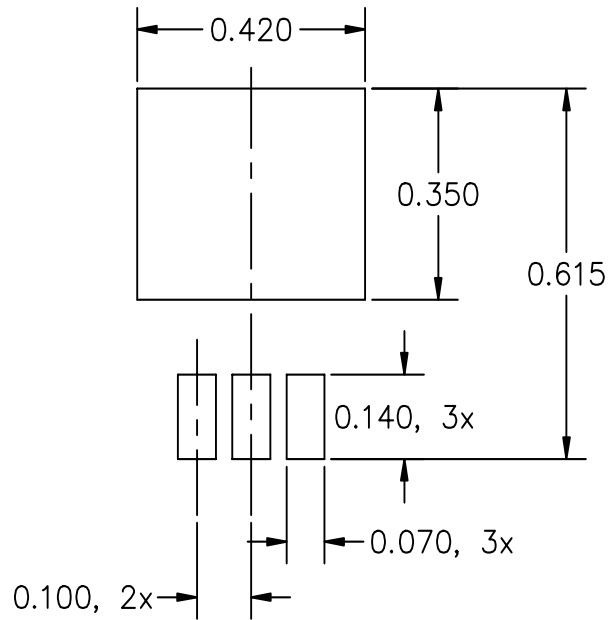
JEDEC TO-220

Outline Drawing - TO-263



DIM ^N	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.380	.405	9.65	10.29	—
B	.575	.625	14.60	15.88	—
C	.325	.340	8.25	8.64	—
D	.055	.066	1.40	1.68	—
E	.020	.039	.50	.99	—
F	.100	BSC	2.54	BSC	—
G	.045	.055	1.14	1.40	—
H	.160	.190	4.06	4.83	—
J	.090	.110	2.28	2.80	—
K	.018	.029	.457	.736	—

JEDEC TO-263

POWER MANAGEMENT**Land Pattern - T0-263**

NOTE: ALL DIMENSIONS ARE IN INCHES

Contact Information

Semtech Corporation
Power Management Products Division
652 Mitchell Rd., Newbury Park, CA 91320
Phone: (805)498-2111 FAX (805)498-3804