EZ55Z3L
0.25 Amp Positive Voltage Regulators

Description

The EZ55Z3L voltage regulators are monolithic integrated circuits designed for use in applications requiring a well regulated positive output voltage with low input-to-output differential voltage requirements.

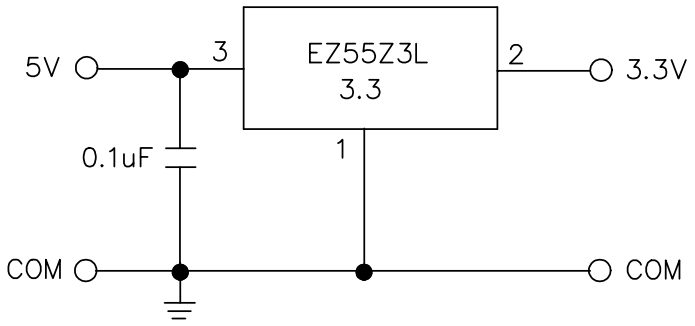
Outstanding features include full power usage up to 250mA of load current, internal current limiting and thermal shutdown. Safe area protection on the die is also included, providing protection of the series pass transistor under most operating conditions. TO-92 and SOT-223 packages are available for cost effective applications.

Features

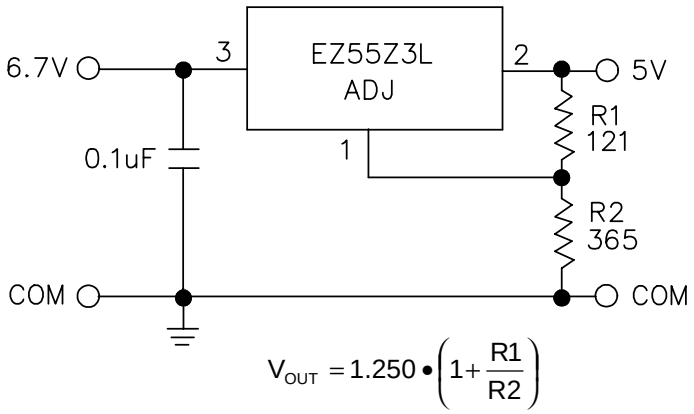
- External capacitor not required for stability
- Low dropout performance
- Five fixed voltage options: 3.3V, 5V, 9V, 12V, 24V
- Adjustable output down to 1.25V
- Line regulation typically 0.015%
- Load regulation typically 0.1%
- TO-92 and SOT-223 packages

Typical Application Circuits

Fixed Voltage Regulator



Adjustable Voltage Regulator



$$V_{OUT} = 1.250 \bullet \left(1 + \frac{R1}{R2}\right)$$

Absolute Maximum Ratings

Parameter	Symbol	Maximum	Units
Operating Input Voltage	V_{IN}	V_{OUT} + 10	V
Power Dissipation(1)	P_D	2.5	W
Thermal Resistance Junction to Ambient SOT-223 TO-92	θ_{JA}	 62.3 132	°C/W
Thermal Resistance Junction to Case SOT-223 TO-92	θ_{JC}	 15 66	°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}	300	°C
ESD Rating (Human Body Model)	V_{ESD}	2	kV

Note:

(1) Specifications are applicable for a power dissipation of 2.5W and are only achievable over a limited range of V_{IN} - V_{OUT}.

Electrical Characteristics

Unless otherwise specified: (V_{IN} - V_{OUT}) = 1.45V to 10V and I_{OUT} = 10mA to 250mA. Values in **bold** apply over the full operating temperature range.

Parameter	Symbol	Conditions(1)	Min	Typ	Max	Units
Output Voltage(2)	V_{OUT}	V_{IN} = V_{OUT} + 3V, I_{OUT} = 10mA	-3%	V_{OUT}	+3%	V
Fixed Voltage Version			**-4%**		**+4%**	
Reference Voltage(2)	V_{REF}	V_{IN} = V_{OUT} + 3V, I_{OUT} = 10mA	1.213	1.250	1.288	V
Adj. Voltage Version			**1.200**		**1.300**	
Line Regulation(2)	$REG_{(LINE)}$	I_{OUT} = 10mA		0.015	0.2	%
				0.035	**0.2**	
Load Regulation(2)	$REG_{(LOAD)}$	V_{IN} = 3V		0.1	0.3	%
				0.2	**0.4**	
Dropout Voltage ΔV_{OUT}, ΔV_{REF} = 1%	V_D			**1.3**	**1.5**	V
Surge Current Limit	I_S			**0.5**		A
Quiescent Current	I_Q	V_{IN} = 10V		**10**	**15**	mA
Thermal Regulation(3)	$REG_{(THERM)}$			0.002	0.01	%/W

Electrical Characteristics (Cont.)

Unless otherwise specified: (V_{IN} - V_{OUT}) = 1.45V to 10V and I_{OUT} = 10mA to 250mA. Values in **bold** apply over the full operating temperature range.

Parameter	Symbol	Conditions[1]	Min	Typ	Max	Units
Adjust Pin Current	I_{ADJ}			55		µA
					120	
Adjust Pin Current Change	ΔI_{ADJ}			**0.2**	**5**	µA
Temperature Stability	T_S	V_{IN} = 5V, I_{OUT} = 250mA		**0.5**		%
Minimum Load Current	I_{OUT}	V_{IN} = 10V		**5**	**10**	mA
RMS Output Noise[4]	V_N			0.003		$\%V_{OUT}$
Ripple Rejection Ratio[5]	R_A	V_{IN} = 5V, I_{OUT} = 250mA	**60**	**72**		dB

Notes:

(1) Specifications are applicable for a power dissipation of 2.5W and are only achievable over a limited range of V_{IN} - V_{OUT}.

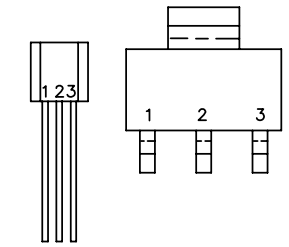
(2) Low duty cycle pulse testing with Kelvin connections required. Changes in output voltage due to heating effects are covered under the specification for thermal regulation.

(3) 30ms pulse.

(4) Bandwidth of 10Hz to 10kHz

(5) 120Hz input ripple, 1 dB less for each volt increase above 3.3V Min.; C_{OUT} & C_{ADJ} (for ADJ) = 25µF.

Pin Configurations



TO–92 SOT–223

PIN	FUNCTION
1	ADJ/GND
2	OUT
3	IN
SOT-223 Tab is OUT	

Ordering Information

Device[1]	Package
EZ55Z3L-SX.TR[2]	SOT-223
EZ55Z3L-ZX.TR[3]	TO-92

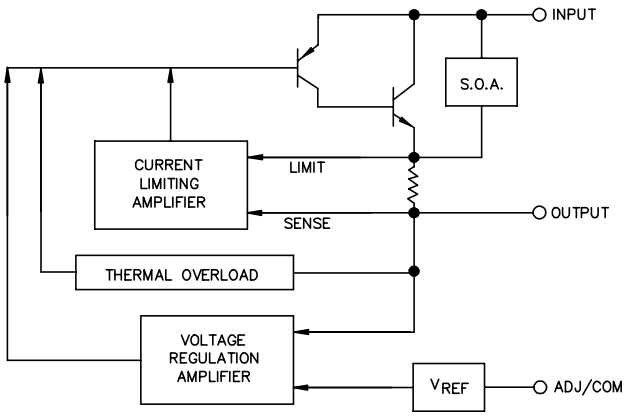
Notes:

(1) Where X denotes voltage options. Available voltages are: 3.3V, 5V, 9V, 12V and 24V. Replace X with "ADJ" for adjustable version (1.25 to 24V).

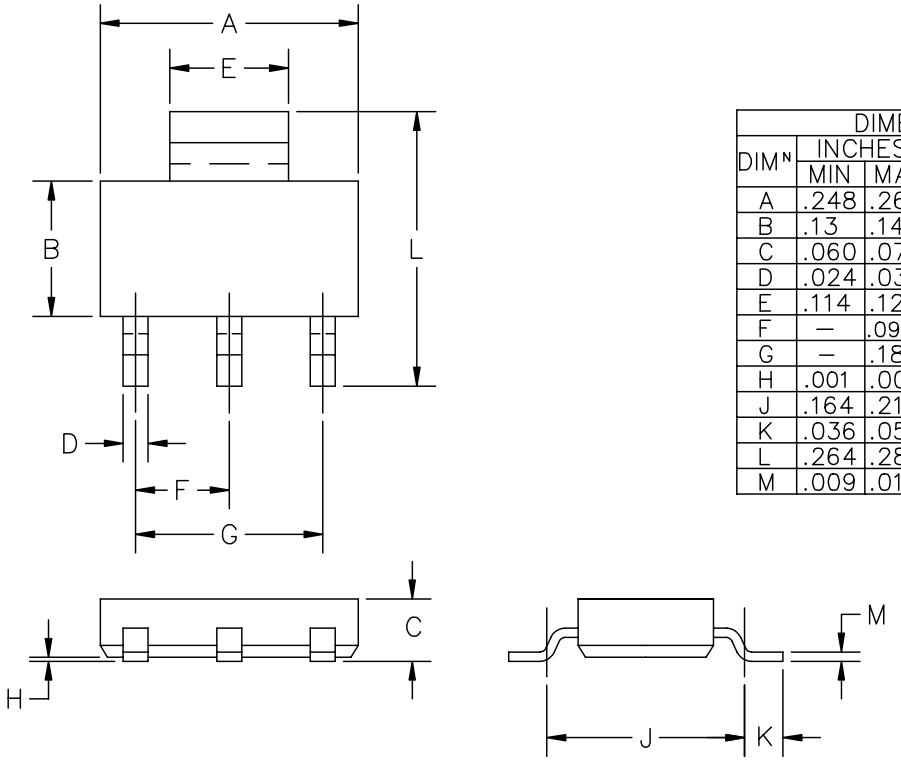
(2) Only available in tape and reel packaging. A reel contains 2500 devices.

(3) Available in tape and reel packaging (a reel contains 3000 devices) or ammo pack (suffix TA, an ammo pack contains 2000 devices).

Block Diagram



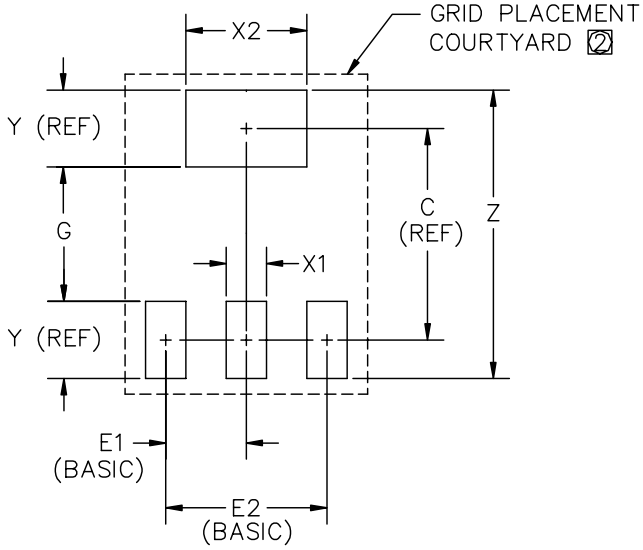
Outline Drawing - SOT-223



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.248	.264	6.30	6.70	–
B	.13	.146	3.30	3.70	–
C	.060	.071	1.52	1.80	–
D	.024	.031	.60	.80	–
E	.114	.122	2.90	3.10	–
F	–	.090	–	2.30	BSC
G	–	.181	–	4.60	BSC
H	.001	.004	.020	.100	–
J	.164	.215	4.16	5.46	–
K	.036	.05	.91	1.27	–
L	.264	.287	6.70	7.30	–
M	.009	.013	.24	.32	–

CONTROLLING DIMENSIONS: MILLIMETERS.

Land Pattern - SOT-223

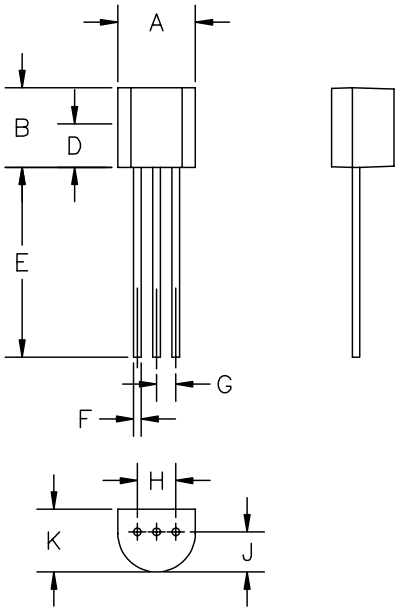


DIMENSIONS (1)					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
C	–	.24	–	6.20	–
E1	–	.09	–	2.30	–
E2	–	.18	–	4.60	–
G	.15	.16	4.00	4.20	–
X1	.03	.04	1.00	1.20	–
X2	.13	.14	3.40	3.60	–
Y	–	.09	–	2.20	–
Z	.32	.33	8.20	8.40	–

(2) GRID PLACEMENT COURTYARD IS 18 x 14 ELEMENTS (9 mm X 7mm) IN ACCORDANCE WITH THE INTERNATIONAL GRID DETAILED IN IEC PUBLICATION 97.

(1) CONTROLLING DIMENSION: MILLIMETERS

Outline Drawing - TO-92



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.175	.205	4.445	5.207	—
B	.170	.210	4.318	5.334	—
E	.500	.610	12.7	15.5	—
F	.016	.021	.407	.533	—
G	.045	.055	1.143	1.397	—
H	.095	.105	2.413	2.667	—
J	.080	.105	2.032	2.667	—
K	.125	.165	3.175	4.191	—

Contact Information

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