

## DESCRIPTION

The LM317EMPX/NOPB-JSM is an adjustable 3-terminal positive voltage regulator, designed to supply 1A of output current with voltage adjustable from 1.25V ~ 37V.

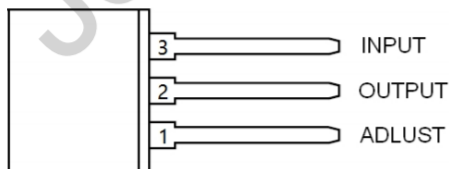
## FEATURES

Typical 1% Output Voltage Tolerance  
Output voltage adjustable from 1.25V ~ 37V  
Output current in excess of 1A  
Internal short circuit protection  
Internal over temperature protection  
Output transistor safe area compensation

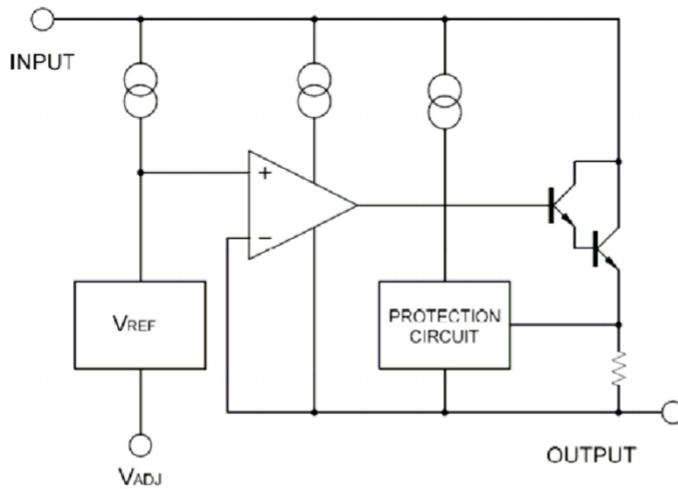
## APPLICATIONS

PC Motherboard  
LCD Monitor  
Graphic Card  
DVD Player  
Network Interface Card/Switch  
Telecom Equipment  
Printer and other Peripheral Equipment

## Pin Configuration (Top View)



**BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS** ( $T_a=25^{\circ}\text{C}$ ) \*

Characteristic	Symbol	Min.	Max.	Unit
Input - Output Voltage Difference	$V_{in}-V_{out}$		37	V
Power Dissipation	$P_d$	Internal limited		
Maximum junction temperature	$T_J$		150	$^{\circ}\text{C}$
Storage temperature	$T_S$	-40	150	$^{\circ}\text{C}$
Lead temperature (soldering, 10sec)	$T_{LEAD}$		260	$^{\circ}\text{C}$
ESD (human body model)	ESD		4000	V

\*: Absolute maximum ratings are stress ratings only and functional device operation is not implied. The device could be damaged beyond Absolute maximum ratings.

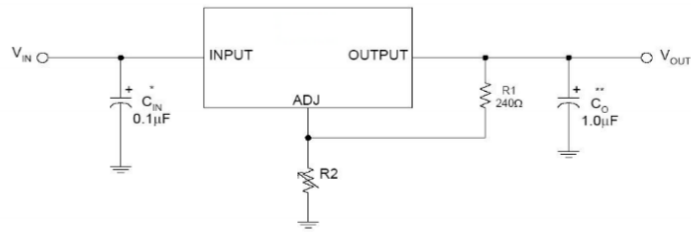
**ELECTRICAL CHARACTERISTICS**

(VIN-VOUT=5V, IOU=10mA, Ta=25° C, unless otherwise specified. ) \*

Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Reference voltage	10mA ≤ I <sub>OUT</sub> ≤ 1A	VREF	1.20	1.25	1.30	V
	3V ≤ (V <sub>IN</sub> - V <sub>OUT</sub> ) ≤ 37V					
	PD ≤ 20W					
Line regulation	3V ≤ VIN-VOUT ≤ 37V	SV		0.01	0.04	%/V
Load regulation	0mA ≤ IOU <sub>T</sub> ≤ 1A	Si		0.2	0.4	%
Adjust pin current		I <sub>adj</sub>		50	100	μA
Adjust pin current change	3V ≤ VIN-VOUT ≤ 37V, 10mA ≤ IOU <sub>T</sub> ≤ 1A, PD ≤ 20W	I <sub>adj</sub>		0.2	5.0	μA
Minimum load current	VIN-VOUT=37V	ILmin		3.5	10.0	mA
Ripple rejection	f=120Hz, C <sub>OUT</sub> =1μF tantalum,	RR	60	75		dB
	(V <sub>IN</sub> - V <sub>OUT</sub> )=3V,					
	I <sub>OUT</sub> =1A					
Temperature stability	T <sub>MIN</sub> T <sub>J</sub> T <sub>MAX</sub>			0.7		%
RMS output noise (% of V <sub>O U T</sub> )	Ta=25°C, 10Hz ≤ f ≤ 10kHz	e <sub>n</sub>		0.003		%
Thermal resistance, Junction to case	SOT223	θ <sub>J C</sub>				°C/W
	TO252					
	TO220					
	TO263					
Thermal resistance, Junction to Ambient	SOT223	θ <sub>J A</sub>				°C/W
	TO252					
	TO220					
	TO263					
Thermal shutdown hysteresis		Thys		25		°C/W

\*: Maximum Power Dissipation is Package Type and Case Temperature dependent.

**APPLICATION CIRCUIT**



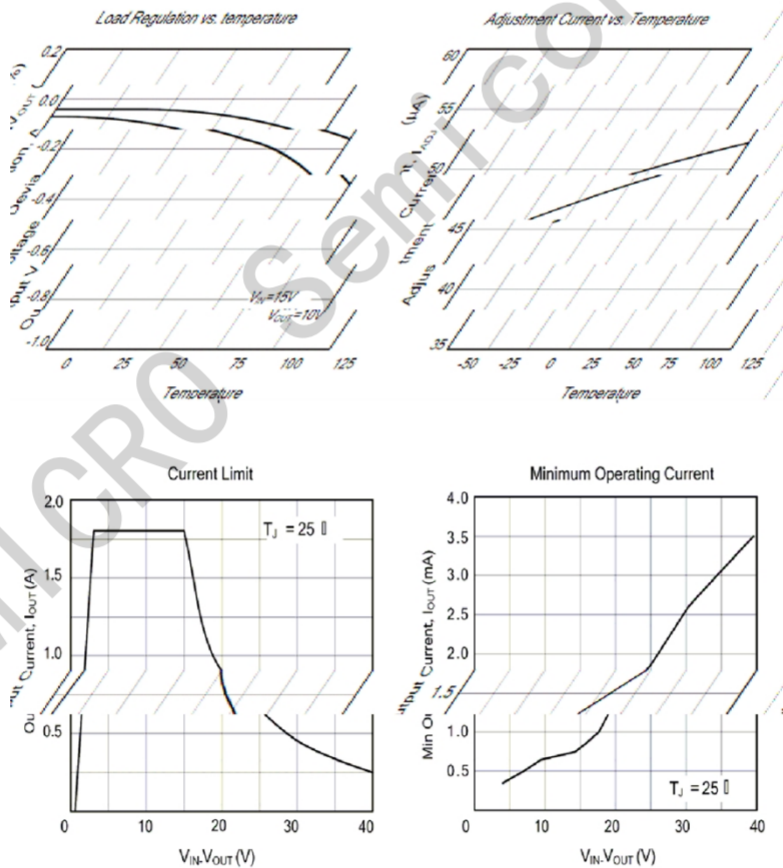
\* = C<sub>IN</sub> is required if the regulator is located near power supply filter.

\*\*= C<sub>O</sub> is needed for stability and it improves transient response.

$$V_{OUT} = V_{REF} \times (1 + R2/R1) + I_{ADJ} \times R2$$

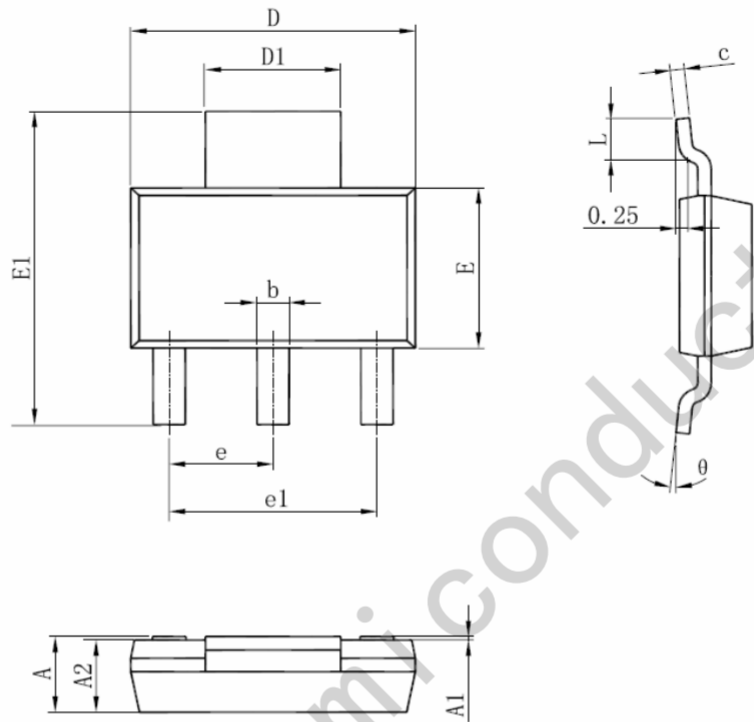
Since I<sub>ADJ</sub> is controlled to less than 100µA, the error associated with this term is negligible in most applications.

**CHARACTERISTICS CURVES**



## Package Information

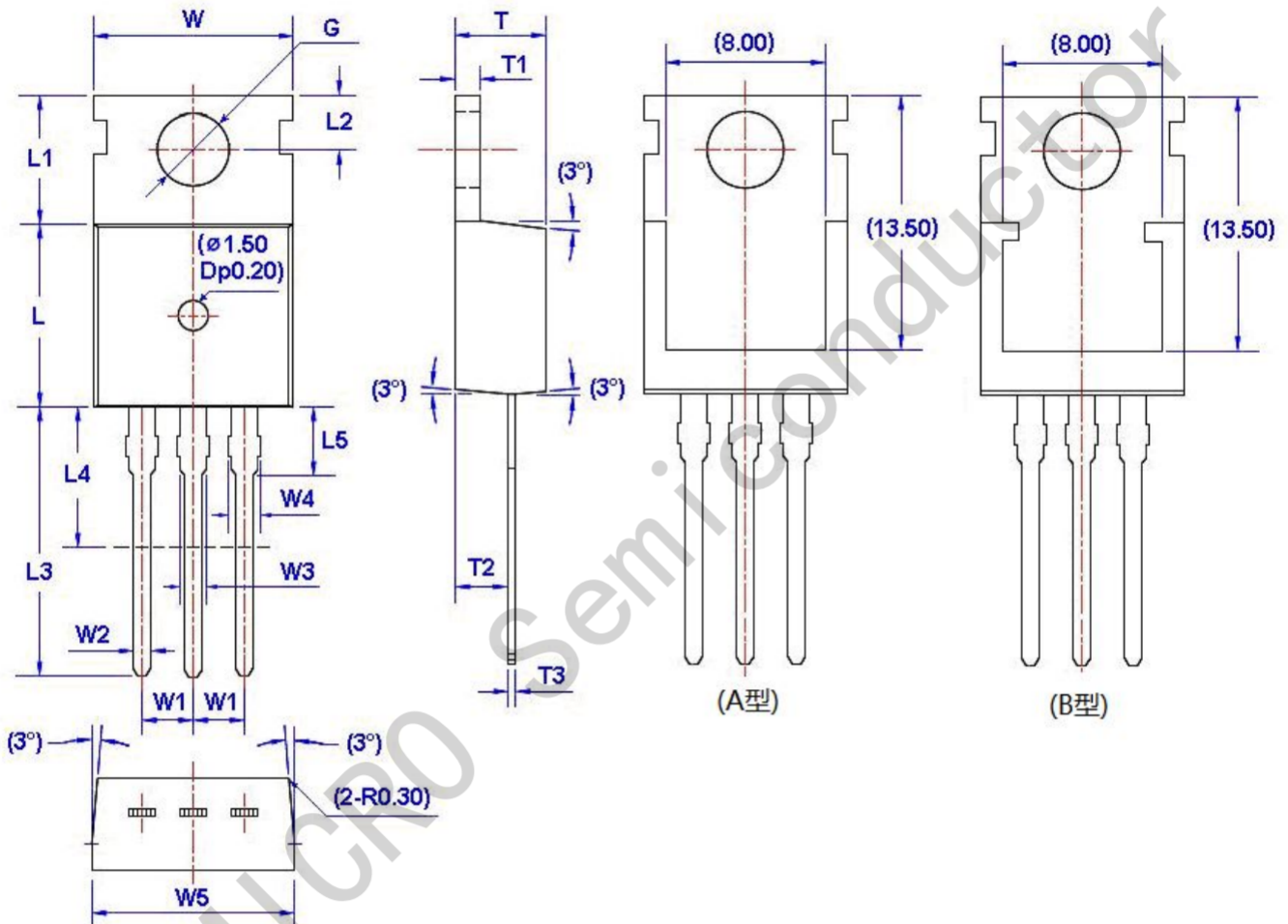
SOT-223



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
theta	0°	10°	0°	10°

### Package Information

TO-220

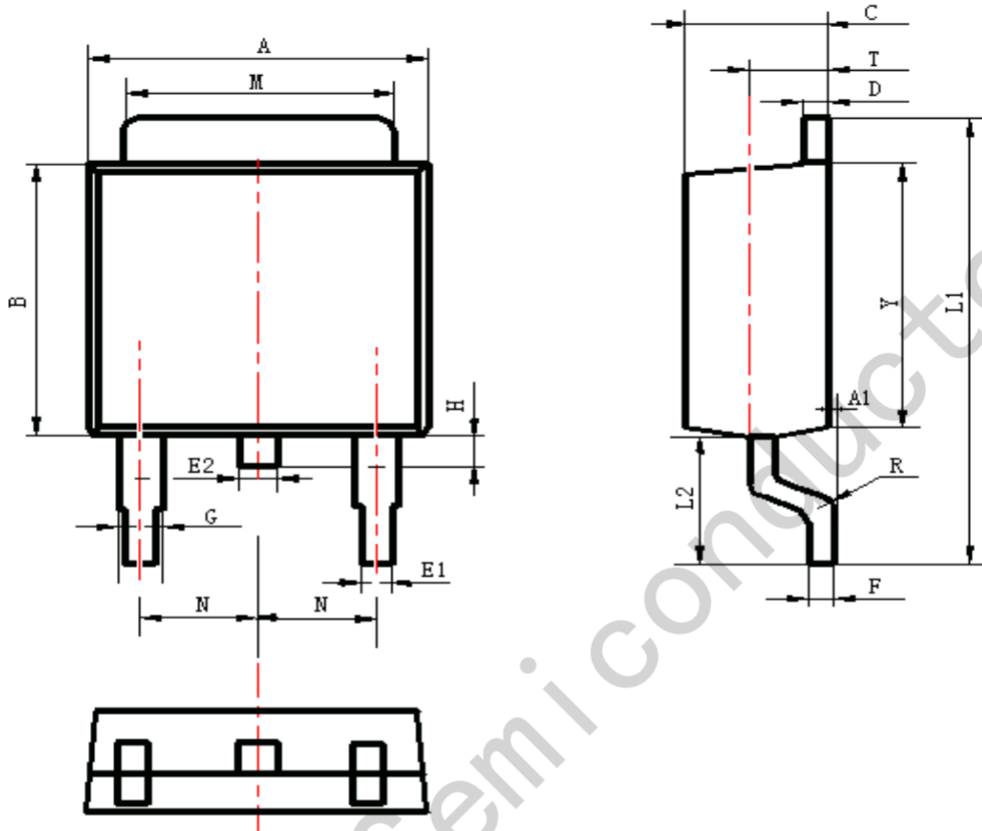


Unit: mm

Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.66	10.28	W5	9.80	10.20	L4**	6.20	6.60	T3	0.45	0.60
W1	2.54 (TYP)		L	9.00	9.40	L5	2.79	3.30	G(Φ)	3.50	3.70
W2	0.70	0.95	L1	6.40	6.80	T	4.30	4.70			
W3	1.17	1.37	L2	2.70	2.90	T1	1.15	1.40			
W4*	1.32	1.72	L3	12.70	14.27	T2	2.20	2.60			

## Package Information

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.30	6.90	0.248	0.272
A1	0.00	0.16	0.000	0.006
B	5.70	6.30	0.224	0.248
C	2.10	2.50	0.083	0.098
D	0.30	0.70	0.012	0.028
E1	0.60	0.90	0.024	0.035
E2	0.70	1.00	0.028	0.039
F	0.30	0.60	0.012	0.024
G	0.70	1.20	0.028	0.047
L1	9.60	10.50	0.378	0.413
L2	2.70	3.10	0.106	0.122
H	0.40	1.00	0.016	0.039
M	5.10	5.50	0.201	0.217
N	2.09	2.49	0.082	0.098
R	0.30		0.012	
T	1.40	1.60	0.055	0.063
Y	5.10	6.30	0.201	0.248

**Package Information**

TO-263

Unit: mm

