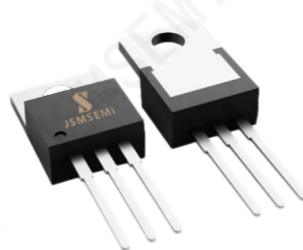
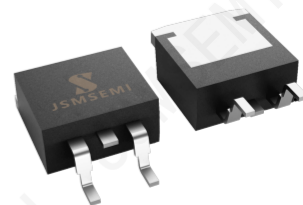


Description

The LM317 Series is an adjustable 3-terminal positive voltage regulator, designed to supply 1.5A of output current with voltage adjustable from 1.25V~32V.



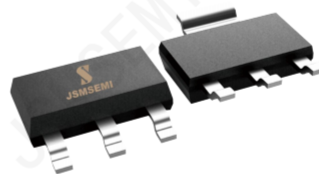
TO-220-3



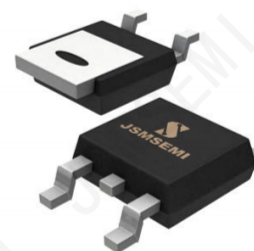
TO-263-2

Features

- ◆ Typical 1% Output Voltage Tolerance
- ◆ Output Voltage Adjustable from 1.25V~32V
- ◆ Output Current in Excess of 1.5A
- ◆ Internal Short Circuit Protection
- ◆ Internal Over Temperature Protection
- ◆ Output Transistor Safe Area Compensation



SOT-223-3L



TO-252

Application

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

Absolute Maximum Ratings(Ta=25°C)*

Parameter	Symbol	Min.	Max.	Unit
Input-Output Voltage Differential	Vin-Vout		32	V
Power Dissipation	P _D	Internally Limited		
Maximum Operating Junction Temperature	T _j	0	125	°C
Lead Temperature(Soldering,10seconds)	T _{LEAD}		260	°C
Storage TemperatureRange	T _{stg}	-40	+150	°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.

Ordering Information

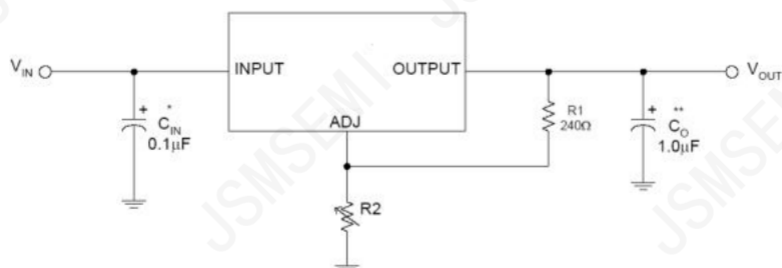
Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
LM317-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317AEMPX/NOPB-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317AG-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317DCYR-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317EMPX-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317G-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MDCYR-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MG-AA3-R-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MQDCYR-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317S-TR-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317AG-AA3-R-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317EMPX/NOPB-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317G-AA3-R-JSM	SOT-223-3L	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317CD2T-JSM	TO-263-2	LM317	0 to 125°C	3	T&R,800	Rohs
LM317D2TR4G-JSM	TO-263-2	LM317	0 to 125°C	3	T&R,800	Rohs
LM317D2T-JSM	TO-263-2	LM317	0 to 125°C	3	T&R,800	Rohs
LM317AL-TQ2-R-JSM	TO-263-2	LM317	0 to 125°C	3	T&R,800	Rohs
LM317D2T-TR-JSM	TO-263-2	LM317	0 to 125°C	3	T&R,800	Rohs
LM317AL-TQ2-R-JSM	TO-263-2	LM317	0 to 125°C	3	T&R,800	Rohs
LM317D2TG-JSM	TO-263-2	LM317T	0 to 125°C	3	T&R,800	Rohs
LM317BD2TR4G-JSM	TO-263-2	LM317T	0 to 125°C	3	T&R,800	Rohs
LM317SX/NOPB-JSM	TO-263-2	LM317T	0 to 125°C	3	T&R,800	Rohs
LM317KTTR-JSM	TO-263-2	LM317T	0 to 125°C	3	T&R,800	Rohs
LM317M-JSM	TO-252	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MDTRKG-JSM	TO-252	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MDTX-JSM	TO-252	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MDT-TR-JSM	TO-252	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MDTX/NOPB-JSM	TO-252	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MABDTRKG-JSM	TO-252	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317MADTRKG-JSM	TO-252	LM317	0 to 125°C	3	T&R,2500	Rohs
LM317T-JSM	TO-220-3	LM317T	0 to 125°C	3	TUBE,1000	Rohs
LM317MBTG-JSM	TO-220-3	LM317T	0 to 125°C	3	TUBE,1000	Rohs
LM317AL-TA3-T-JSM	TO-220-3	LM317T	0 to 125°C	3	TUBE,1000	Rohs

Electrical Characteristics (Unless otherwise specified: $V_i - V_o = 5.0V$; $I_o = 10mA$; $T_a = 25^\circ C$)

Parameter	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Reference Voltage	$10mA \leq I_{OUT} \leq 1.5A$ $3V \leq V_{IN} - V_{OUT} \leq 32V$ $P_d \leq 20W$	V_{REF}	1.20	1.25	1.30	V
Line Regulation	$3V \leq V_{IN} - V_{OUT} \leq 32V$	LNR	-	0.01	0.04	%/V
Load Regulation	$10mA \leq I_{OUT} \leq 1.5A$	LDR	-	0.2	0.4	%
Adjust Pin Current		I_{adj}	-	50	100	μA
Adjust Pin Current Change	$10mA \leq I_{OUT} \leq 1.5A$ $3V \leq V_{IN} - V_{OUT} \leq 32V$, $P_d \leq 20W$	ΔI_{adj}	-	0.2	5.0	μA
Minimum Load Current	$V_{IN} - V_{OUT} = 32V$	$I_{L(MIN)}$		3.5	10.0	mA
Current Limit	$V_{IN} - V_{OUT} = 3V$	I_{LIMIT}	1.8	2.2		A
Ripple Rejection	$f = 120Hz$, $V_{IN} - V_{OUT} = 3V$, $C_{OUT} = 1\mu F$ Tantalum, $I_{OUT} = 1.5A$	PSRR	60	75		dB
Temperature Stability	$T_{MIN} \leq T_J \leq T_{MAX}$			0.7		%
RMS Output Noise (% of V_{OUT})	$T_a = 25^\circ C$, $10Hz \leq f \leq 10kHz$	E_n		0.003		%/ V_o
Thermal Shutdown Hysteresis		Thys		25		$^\circ C$

Maximum Power Dissipation is Package Type and Case Temperature dependent.

Application Circuit



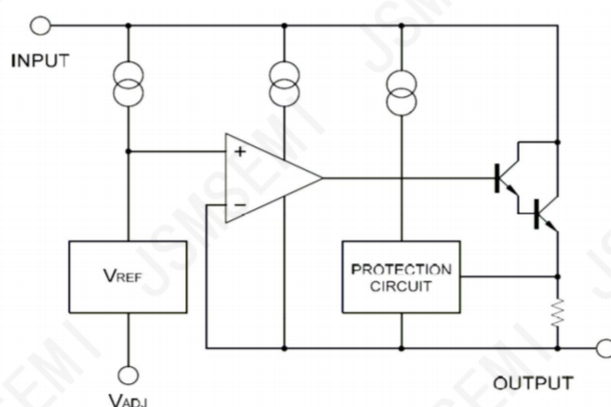
* = C_{IN} is required if the regulator is located near power supply filter.

** = C_O is needed for stability and it improves transient response.

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

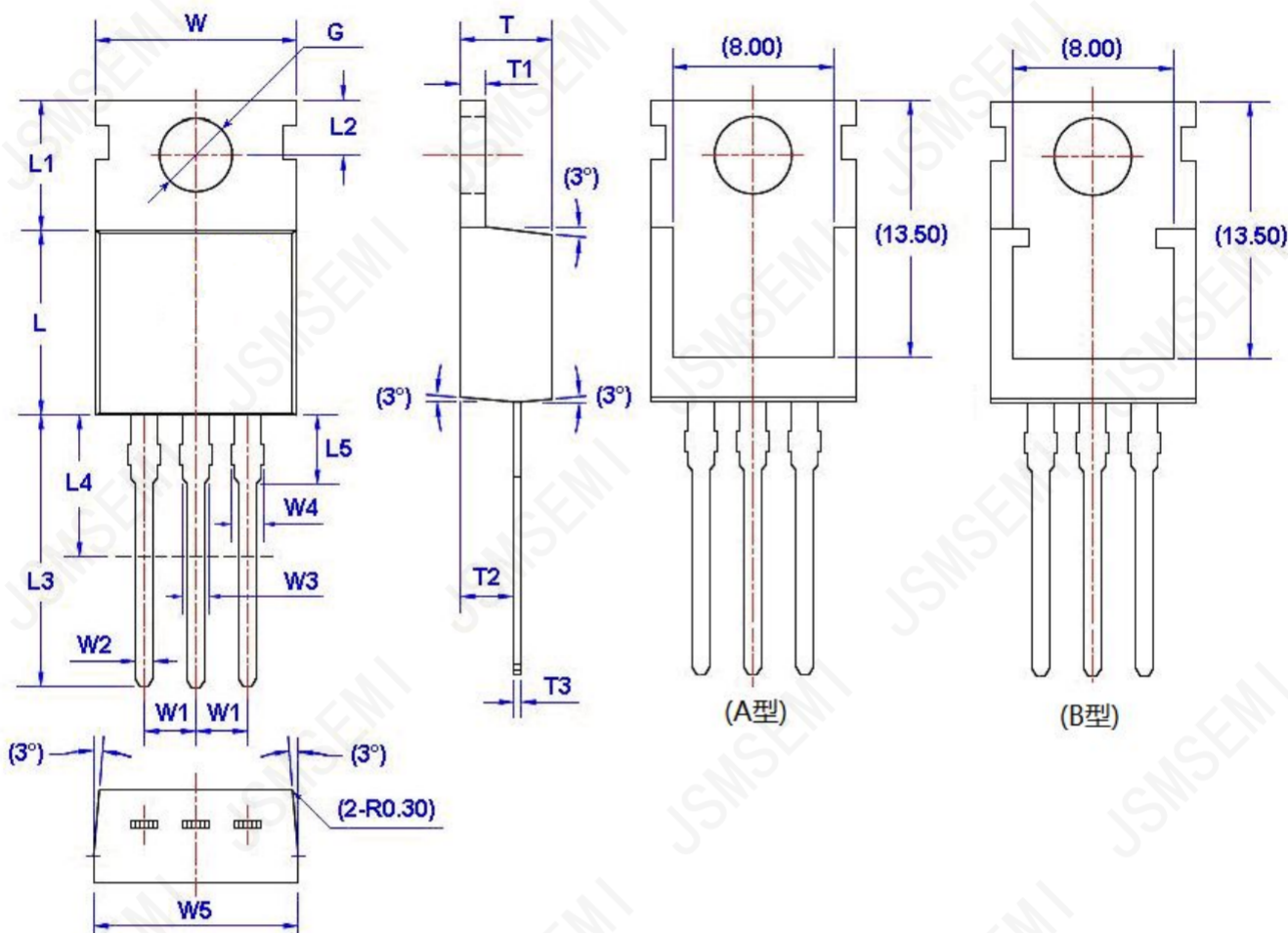
Since I_{ADJ} is controlled to less than $100\mu A$, the error associated with this term is negligible in most applications.

Block Diagram



Package Information

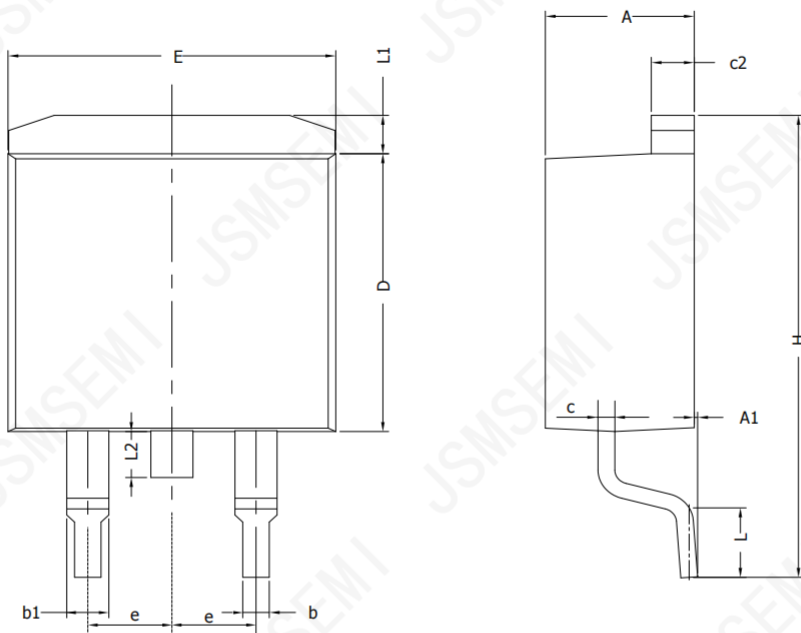
TO-220-3



Unit: mm

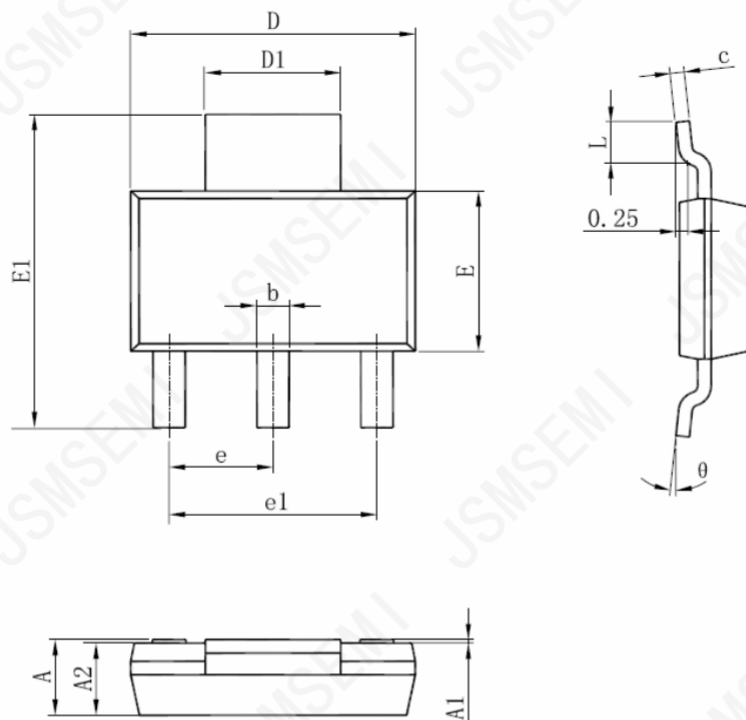
Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.66	10.28	W5	9.80	10.20	L4**	6.20	6.60	T3	0.45	0.60
W1	2.54 (TYP)		L	9.00	9.40	L5	2.79	3.30	G(Φ)	3.50	3.70
W2	0.70	0.95	L1	6.40	6.80	T	4.30	4.70			
W3	1.17	1.37	L2	2.70	2.90	T1	1.15	1.40			
W4*	1.32	1.72	L3	12.70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

TO-263-2



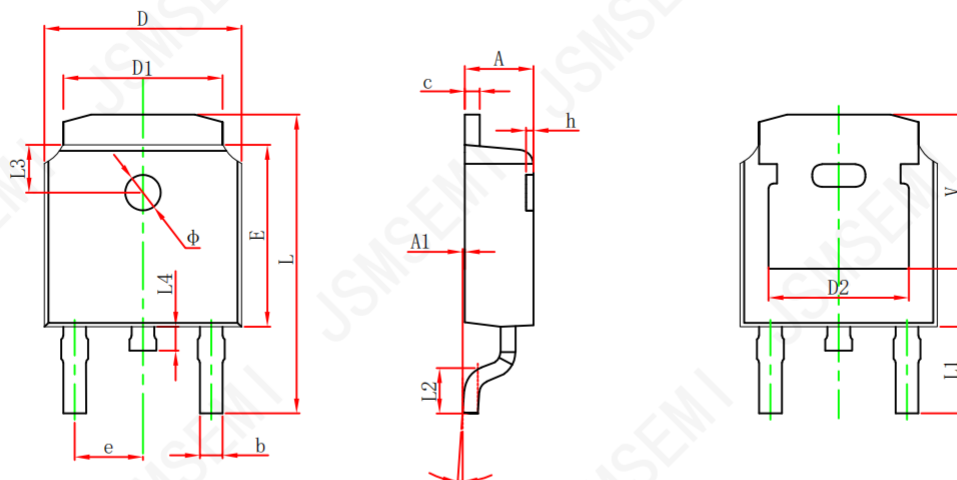
SYMBOL	MIN	NOM	MAX
A	4.30	4.57	4.72
A1	0	0.10	0.25
b	0.71	0.81	0.91
C	0.30	---	0.60
c2	1.17	1.27	1.37
D	8.50	---	9.35
E	9.80	---	10.45
e	2.54BSC		
H	14.70	---	15.75
L	2.00	2.30	2.74
L1	1.12	1.27	1.42
L2	---	---	1.75

SOT-223-3L



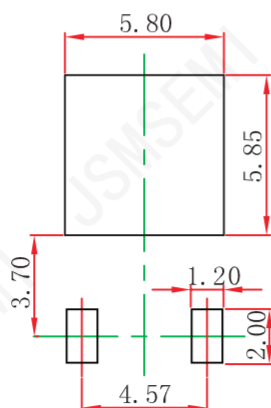
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
C	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	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
θ	0°	10°	0°	10°

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.