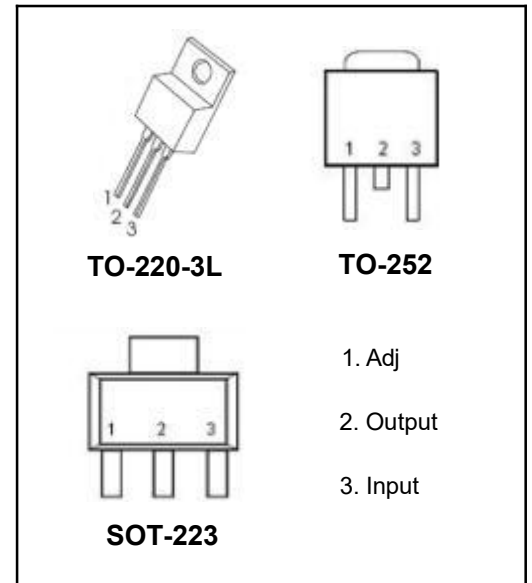


DESCRIPTION

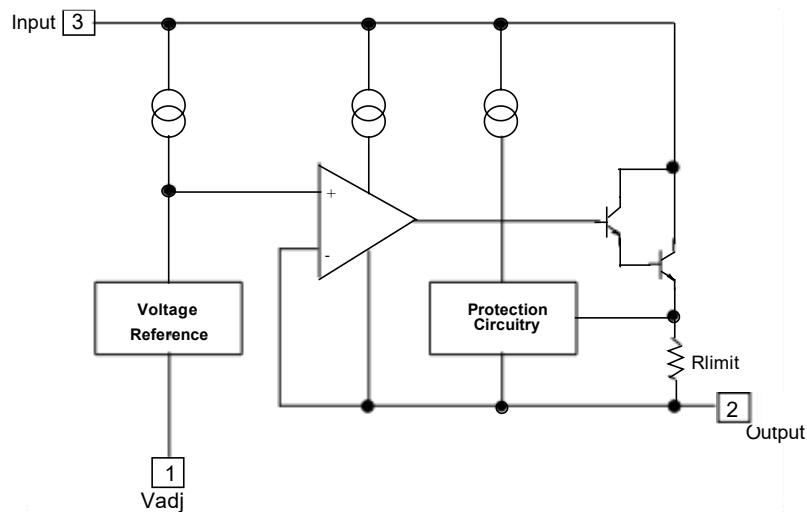
This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 1.5A of load current with an output voltage adjustable over a 1.2 to 37V. It employs internal current limiting, thermal shut-down and safe area compensation.

FEATURE

- ⌘ Internal thermal overload protection
- ⌘ Internal short circuit current limiting
- ⌘ Output transistor safe operating area compensation



Internal Block Diagram



Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V_I-V_O	Input-Output Voltage Differential		40	V
T_{LEAD}	Lead Temperature		230	°C
P_D	Power Dissipation	TO-220	Internally limited	W
		TO-252	2	
		SOT-223	1	
T_J	Operating Junction Temperature Range		0~125	°C
T_{stg}	Storage Temperature Range		-55~125	
$\Delta V_O / \Delta T$	Temperature Coefficient of Output Voltage		±0.02	%/°C

ELECTRICAL CHARACTERISTICS

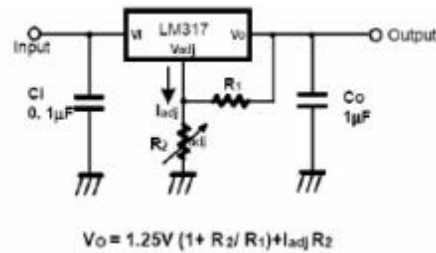
($V_O-V_I=5V$, $I_O=0.5A$, $0^\circ C \leq T_J \leq +125^\circ C$, $I_{MAX}=1.5A$, $P_{DMAX}=20W$, unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Line Regulation(note1)	R_{line}	$T_A=25^\circ C$ $3V \leq V_I-V_O \leq 40V$		0.01	0.04	% / V
		$3V \leq V_I-V_O \leq 40V$		0.02	0.07	
Load Regulation(note1)	R_{load}	$T_A=25^\circ C$, $10mA \leq I_O \leq I_{MAX}$ $V_O < 5V$ $V_O \geq 5V$		18 0.4	25 0.5	mV
		$10mA \leq I_O \leq I_{MAX}$ $V_O < 5V$ $V_O \geq 5V$		40 0.8	70 1.5	% V_O
Adjustable Pin Current	I_{ADJ}	-		46	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	$3V \leq V_I-V_O \leq 40V$ $10mA \leq I_O \leq I_{MAX}$, $P_D \leq P_{MAX}$		2.0	5	
Reference Voltage	V_{REF}	$3V \leq V_I-V_O \leq 40V$ $10mA \leq I_O \leq I_{MAX}$, $P_D \leq P_{MAX}$	1.20	1.25	1.30	V
Temperature Stability	ST_T	-		0.7		% / V_O
Minimum Load Current to Maintain Regulation	$I_{L(MIN)}$	$V_I-V_O=40V$		3.5	12	mA
Maximum Output Current	$I_{O(MAX)}$	$V_I-V_O \leq 15V$, $P_D \leq P_{MAX}$ $V_I-V_O \leq 40V$, $P_D \leq P_{MAX}$ $T_A=25^\circ C$	1.0	2.2 0.3		A
RMS Noise,% of V_{OUT}	e_N	$T_A=25^\circ C$, $10Hz \leq f \leq 10KHz$		0.003	0.01	% / V_O
Ripple Rejection	RR	$V_O=10V$, $f=120Hz$ without C_{ADJ} $C_{ADJ}=10\mu F$ (note2)	66	60 75		dB
Long-Term Stability, $T_J=T_{HIGH}$	ST	$T_A=25^\circ C$ for end point measurements, 1000 HR		0.3	1	%
Thermal Resistance Junction to case	$R_{\theta JC}$	-		5		°C/W

Notes:

1. Load and line regulation are specified at constant junction temperature. Change in V_D due to heating effects must be taken into account separately. Pulse testing with low duty is used. ($P_{MAX}=20W$)
2. C_{ADJ} - when used, is connected between the adjustment pin and ground.

Typical Application

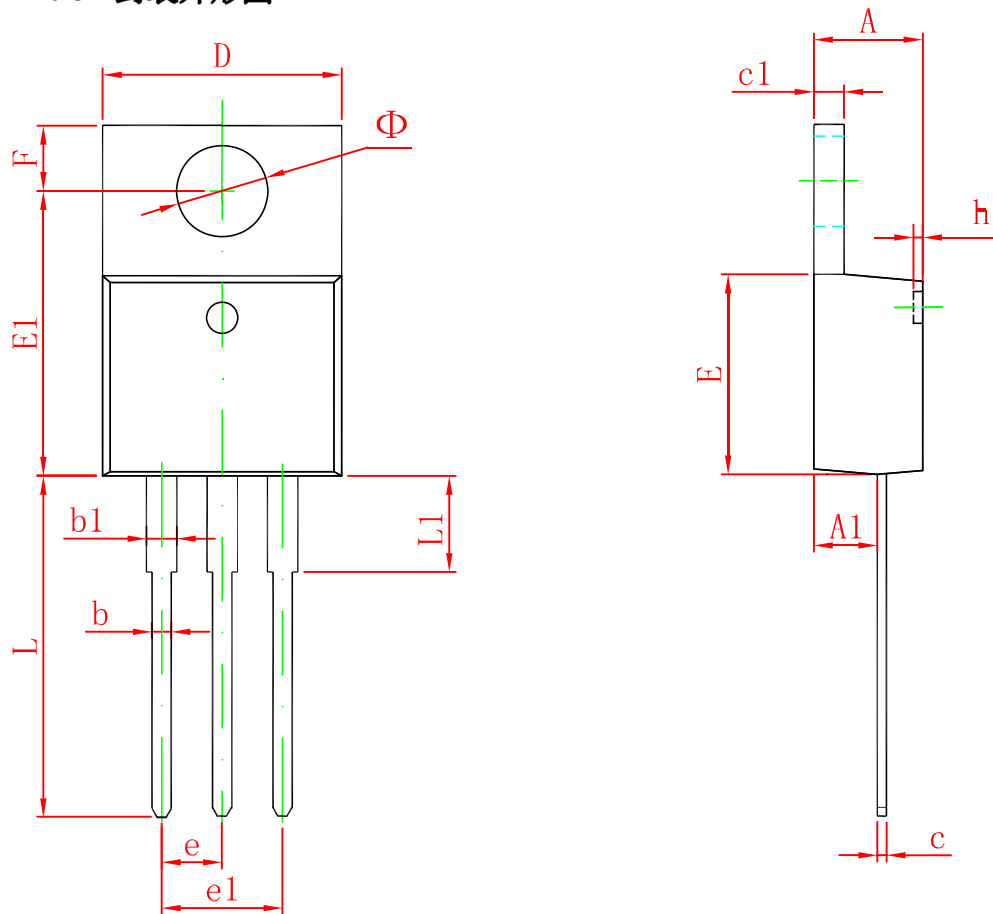


C_i is required when regulator is located an appreciable distance from power supply filter.

C_o is not needed for stability, however, it does improve transient response.

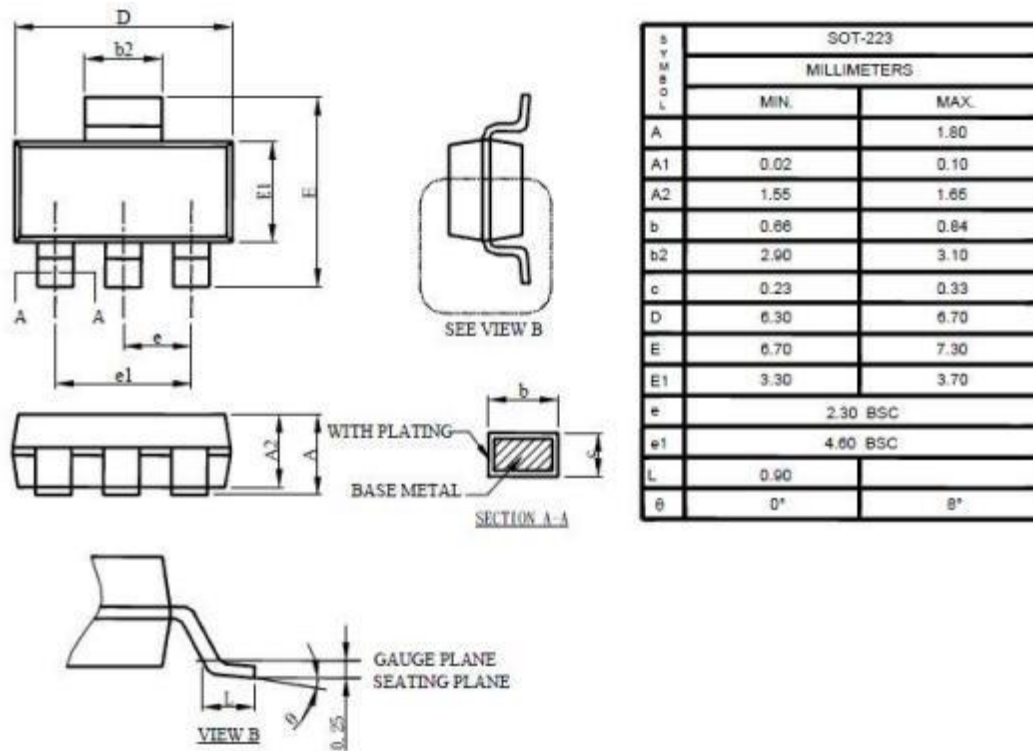
Since I_{ADJ} is controlled to less than 100μA, the error associated with this term is negligible in most applications.

■ TO-220-3L 封裝外形圖



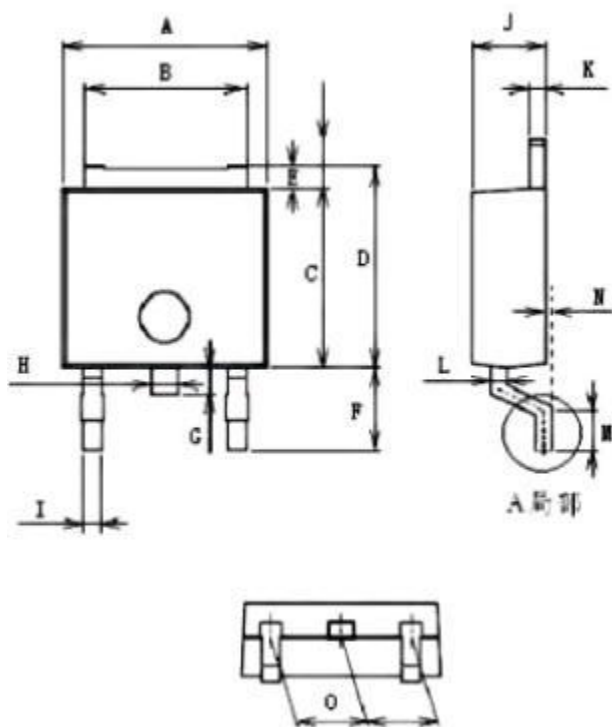
Symbol	D imensions In Millimeters		D imensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.11 1
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155

■ SOT223 封装外形图



- Note:
1. Refer to JEDEC TO-261AA.
 2. Dimension D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs, and interlead flash, but including any mismatch between the top and bottom of the plastic body.
 3. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

■ TO-252 封装外形图



Unit: mm

Item	Min	Max
A	6.40	6.70
B	5.20	5.40
C	6.00	6.30
D	6.55	6.85
E	0.45	0.60
F	3.07	3.35
G	0.85	1.05
H	0.75	0.95
I	0.55	0.75
J	2.20	2.40
K	0.43	0.58
L	0.43	0.58
M	0.90	1.10
N	0.90	1.10
O	2.20	2.40

Ordering information

Order Code	Package	Baseqty	Deliverymode
UMW LM317DCYR	SOT-223	2500	Tape and reel
UMW LM317T	TO-220	1000	Tube and box
UMW LM317MDT	TO-252	2500	Tape and reel

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