1.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.

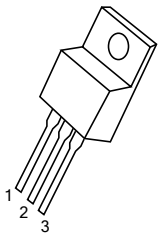
2.Features

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

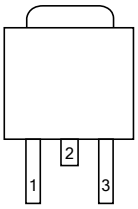
3.Pinning Information

Pin	Symbol	Description
1	A	Adj
2	O	Output
3	I	Input

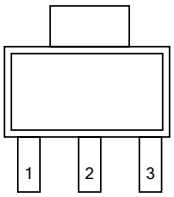
TO-220



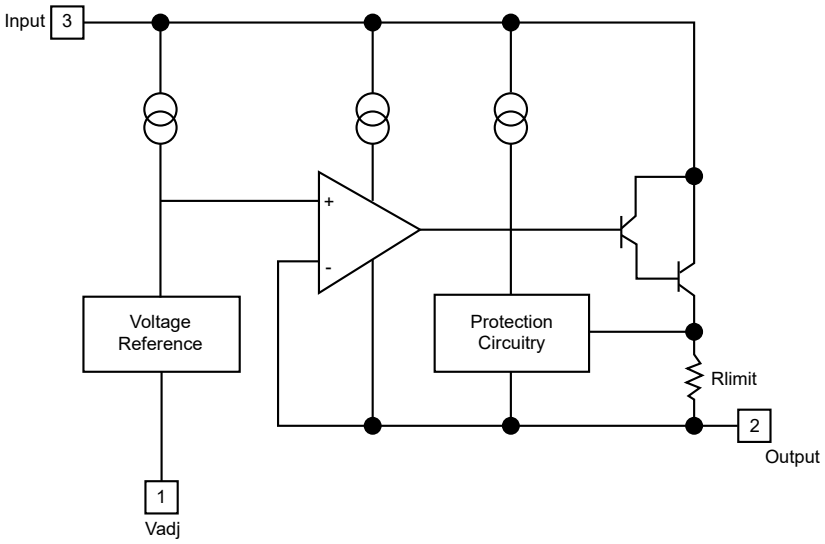
TO-252



SOT-223



4.Internal Block Digram



5.Absolute Maximum Rating

Parameter		Symbol	Value	Units
Input-Output Voltage Differential		V_I-V_O	40	V
Lead Temperature		T_{LEAD}	230	°C
Power Dissipation	TO-220	P_D	Internally limited	W
	TO-252		2	W
	SOT-223		1	W
Junction Temperature Range		T_J	125	°C
Storage Temperature Range		T_{STG}	-55 to 125	°C
Temperature Coefficient of Output Voltage		$\Delta V_O/\Delta T$	±0.02	%/°C
Operating Junction Temperature		T_{OP}	-40 to 105	°C

6.Electrical Characteristics

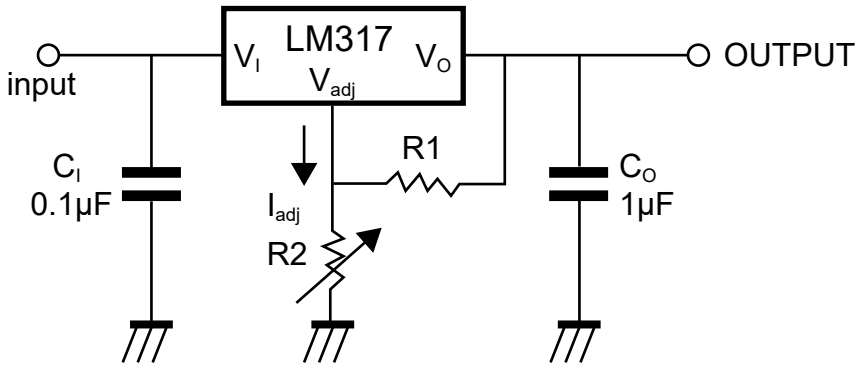
(V_O-V_I=5V, I_O=0.5A, 0°C≤T_J≤+125°C, I_{MAX}=1.5A, P_{DMAX}=20W, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Line Regulation (note1)	R_{line}	T_A=25°C, 3V≤V_I-V_O≤40V		0.01	0.04	%/V
		3V≤V_I-V_O≤40V		0.02	0.07	
Load Regulation (note1)	R_{load}	T_A=25°C, 10mA≤I_O≤I_{MAX}				mV
		V_O<5V		18	25	
		V_O≥5V		0.4	0.5	
		10mA≤I_O≤I_{MAX}				%V_O
		V_O<5V		40	70	
		V_O≥5V		0.8	1.5	
Adjustable Pin Current	I_{ADJ}			46	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	3V≤V_I-V_O≤40V 10mA≤I_O≤I_{MAX},P_D≤ P_{MAX}		2	5	
Reference Voltage	V_{REF}	3V≤V_{IN}-V_O≤40V 10mA≤I_O≤I_{MAX},P_D≤ P_{MAX}	1.2	1.25	1.3	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≤15V, P_D≤P_{MAX} (T_A=25°C)	1	2.2		A
		V_I-V_O≤40V, P_D≤P_{MAX} (T_A=25°C)		0.3		
RMS Noise,% of V_{OUT}	e_N	T_A=25°C, 10Hz≤f≤10KHz		0.003	0.01	%/V_O
Ripple Rejection	RR	V_O=10V, f=120Hz without C_{ADJ}	66	60		dB
		C_{ADJ}=10μF(note2)		75		
Long-Term Stability,T_J=T_{HIGH}	ST	T_A=25°C for end point mesasurements, 1000HR		0.3	1	%
Thermal Resistance Junction to case	$R_{\theta JC}$			25.2		°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.

7.Typical Application



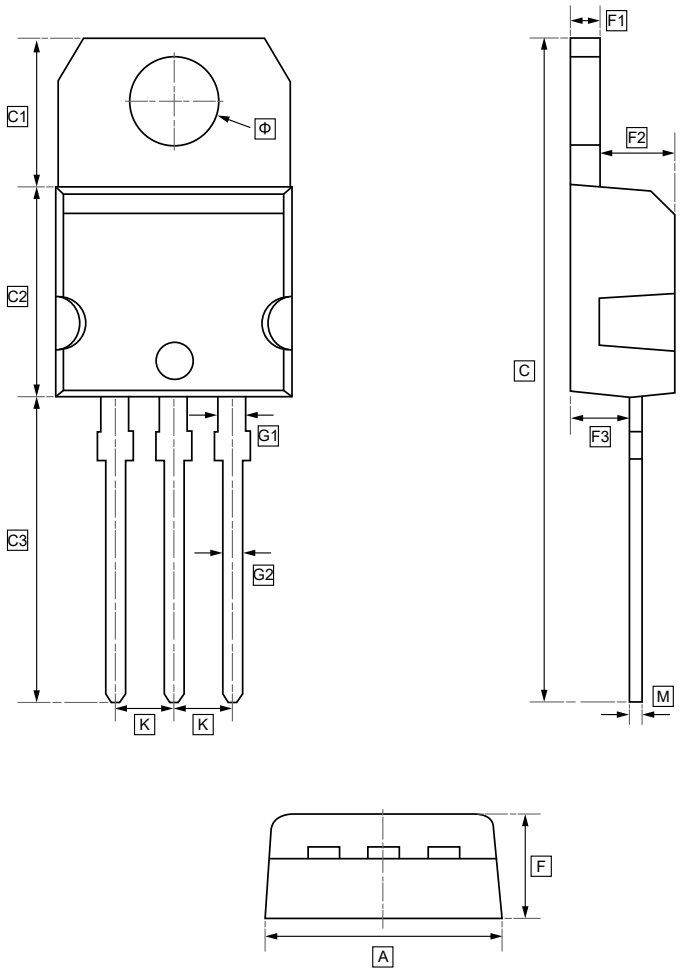
$V_O=1.25V(1+R2/R1)+I_{adj}R2$

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

8.1 TO-220 Package Outline Dimensions

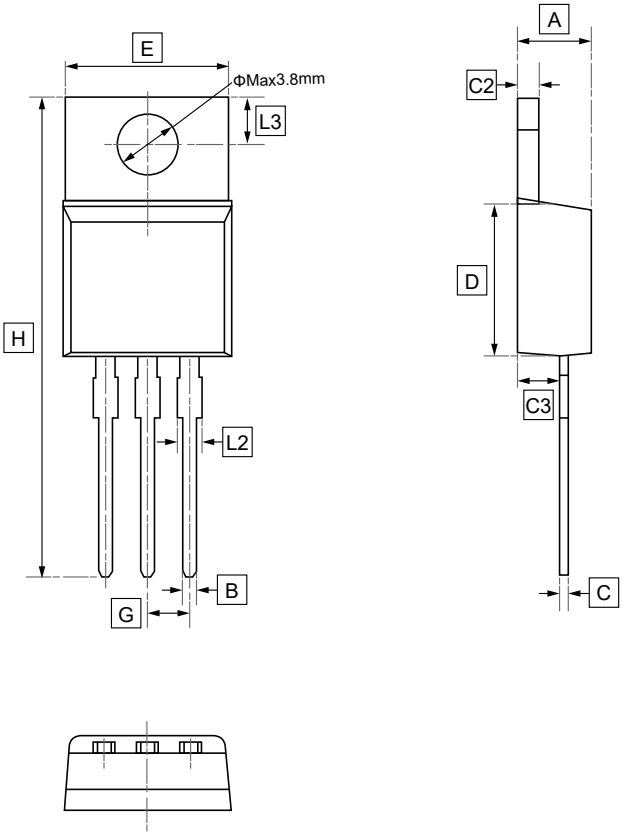


DIMENSIONS (mm are the original dimensions)

Symbol	A	C	C1	C2	C3	Φ	F	F1	F2	F3	G1	G2
Min	10.050	28.500	6.400	8.750	13.160	3.700	4.320	1.200	3.120	2.300	1.200	0.750
Max	10.250	28.900	6.600	8.950	13.460	3.800	4.620	1.300	3.320	2.700	1.300	0.850

Symbol	M	K
Min	0.400	2.450
Max	0.500	2.650

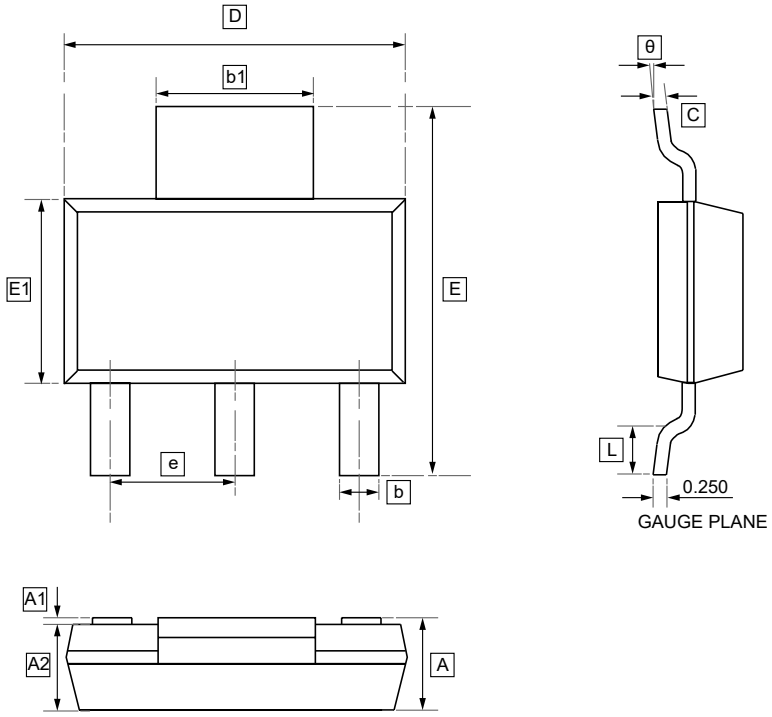
8.2 TO-220 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	C2	C3	D	E	G	H	L2	L3
Min	4.30	0.60	0.28	1.17	2.30	8.80	9.80	2.44	28.55	1.10	2.59
Max	4.70	1.00	0.48	1.37	2.70	9.20	10.20	2.64	29.15	1.50	2.89

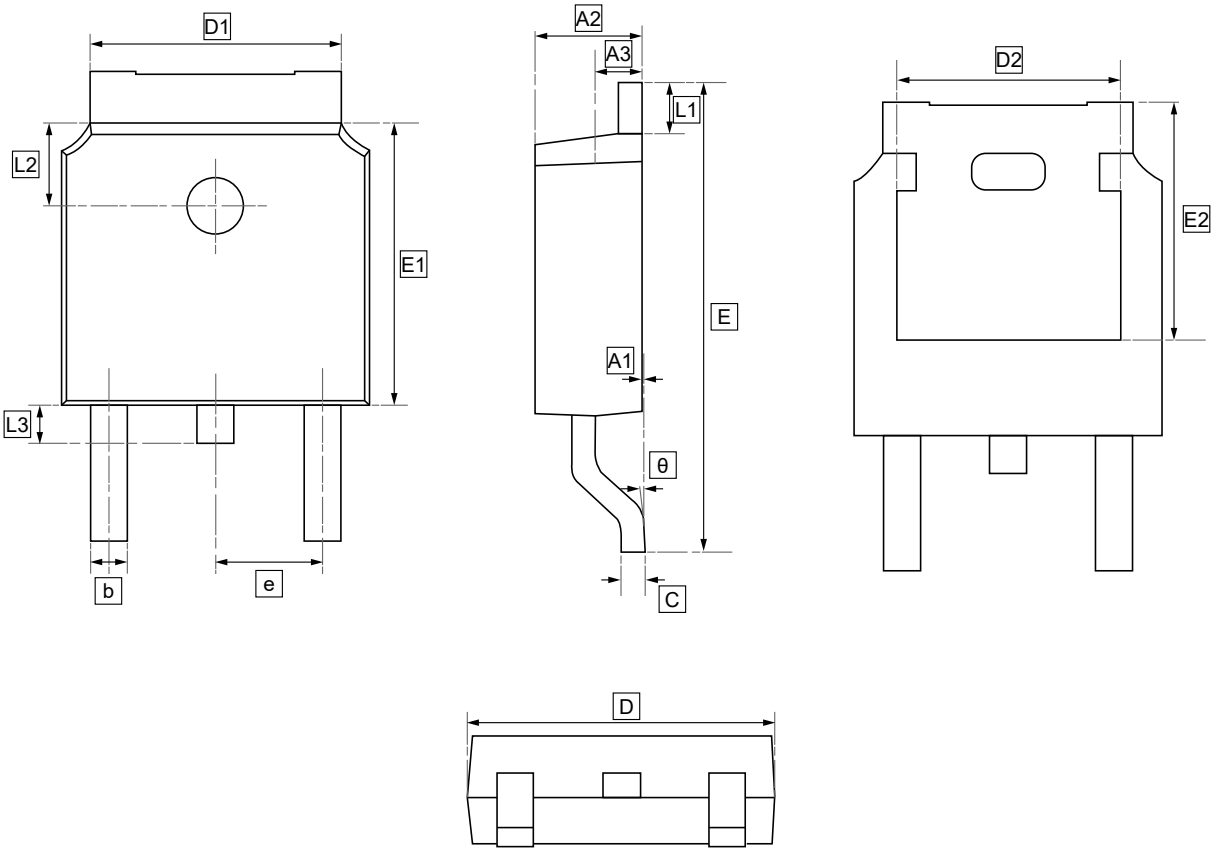
8.3 SOT-223 Package Outlie Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	b1	c	D	E	E1	e	L	θ
Min	-	0.020	1.500	0.660	2.900	0.230	6.300	6.700	3.300	2.300	0.750	0°
Max	1.800	0.100	1.700	0.840	3.100	0.350	6.700	7.300	3.700	BSC	-	10°

8.4 TO-252 Package Outline Dimensions

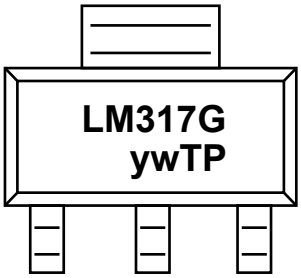


DIMENSIONS (mm are the original dimensions)

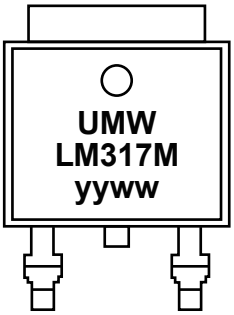
Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38	BSC	1.27	1.90	1.00	8.00

9.Ordering Information

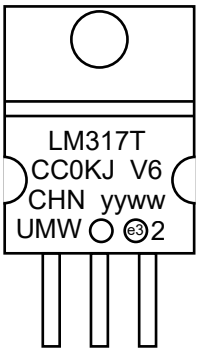
SOT-223



TO-252



TO-220



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW LM317DCYR	LM317	SOT-223	2500	Tape and reel
UMW LM317G	LM317G	SOT-223	2500	Tape and reel
UMW LM317MDT	LM317M	TO-252	2500	Tape and reel
UMW LM317T	LM317T	TO-220	1000	Tube and box



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