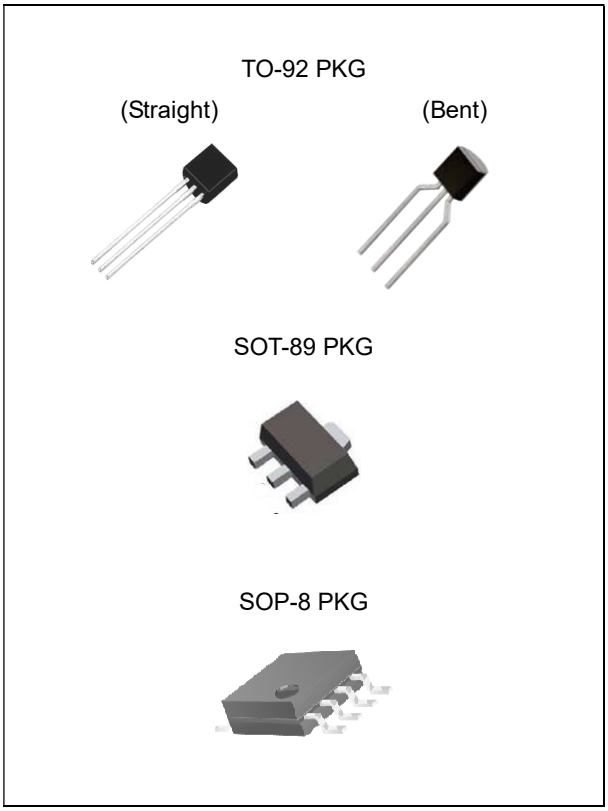
3-Terminal 100mA Positive Adjustable Regulator LM317L

FEATURES

- Output Current Excess of 100mA
- Output Adjustable Between 1.2V and 37V
- Internal Thermal Overload Protection
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation
- Moisture Sensitivity Level 3



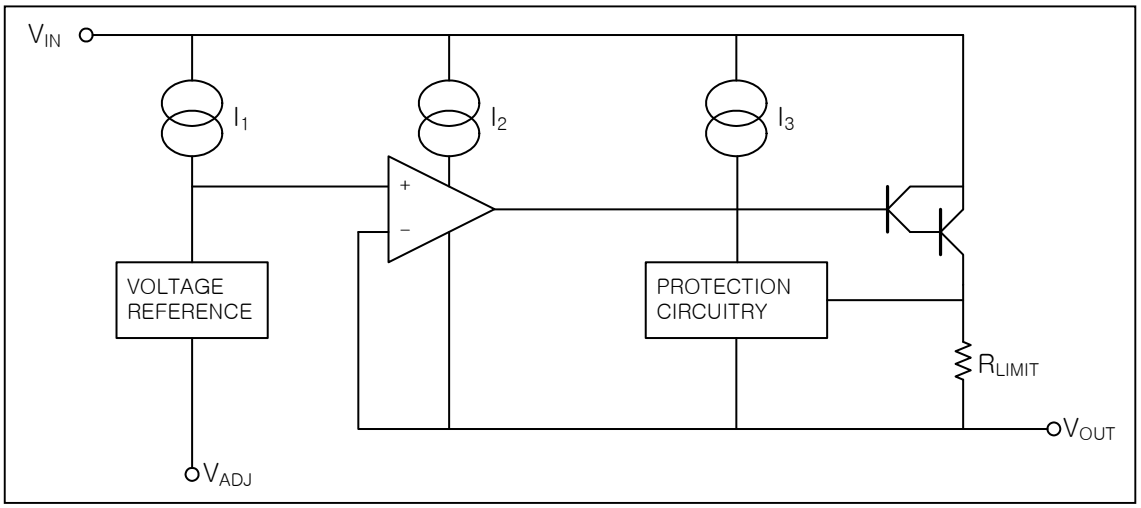
DESCRIPTION

This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 100mA 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.

ORDERING INFORMATION

Device	Package
LM317L	TO-92 (Bulk, Straight)
LM317LTA	TO-92 (Tape, Bent)
LM317LF	SOT-89
LM317LD	SOP-8

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	Value	UNIT
Input-output Voltage Differential	V_I-V_O	40	V
Lead Temperature (Soldering, 10 sec)	T_{SOL}	230	℃
Power Dissipation	P_D	Internally limited	-
Operating Junction Temperature Range	T_{JOPR}	-40 ~ 125	℃
Storage Temperature Range	T_{STG}	-65 ~ 125	℃

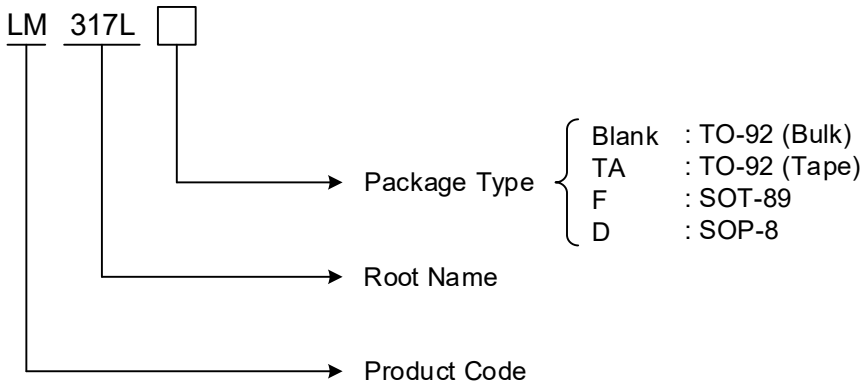
RECOMMENDED OPERATING RATINGS (V_I-V_O=5V, I_O=40mA, -40℃≤TJ≤125℃, unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	Unit
Line Regulation	△Vo	T_A=-40 ~125℃	3V≤V_I-V_O≤40V		0.01	0.04	%/V
			3V≤V_I-V_O≤40V		0.02	0.07	%/V
Load Regulation	△Vo	TA=25℃, 10㎃≤Io≤I_{MAX}					
		V_O≤5V			10	25	mV
		V_O≥5V			0.1	0.5	%/V
		10㎃≤Io≤IMAX					
		V_O≤5V			20	80	mV
		V_O≥5V			0.3	1.7	%/V
Adjustable Pin Current	I_{ADJ}				46	100	μA
Adjustable Pin Current Change	△I_{ADJ}	3V≤V_I-V_O≤40V 10㎃≤I_O≤I_{MAX} P≤P_{MAX}			0.2	5	μA
Reference Voltage	V_{REF}	3V≤V_{IN}-V_{OUT}≤40V 10㎃≤Io≤I_{MAX} P_D≤P_{MAX}		1.20	1.25	1.30	V
Temperature Stability	ST_T				0.7		%/Vo
Minimum Load Current to Maintain Regulation	$L_{(MIN)}$	V_I-V_o=40V			3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	V_I-V_o≤5V, P_D≤P_{MAX}		100	200		mA
		V_I-V_O≤40V, P_D≤P_{MAX}, T_A=25℃		0.156	0.4		
RMS Noise, % of VOUT	e_N	T_A=25℃, 10Hz≤f≤10KHz			0.003	0.01	%/V_O
Ripple Rejection	RR	V_O=10V, f=120Hz without C_{ADJ}			60		dB
		C_{ADJ}=10μF		66	75		
Long-Term Stability, T_J=T_{HIGH}	ST	TA=25℃, for end point measurements, 1000HR			0.3	1	%

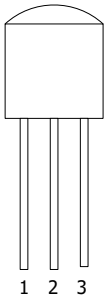
* Load and line regulation are specified at constant junction temperature. Change in VD due to heating effects must be taken into account separately. Pulse testing with low duty is used.

ORDERING INFORMATION

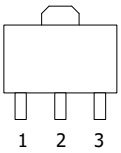
PACKAGE	ORDER NO.	DESCRIPTION	SUPPLIED AS	STATUS
TO-92	LM317L	100mA, Adjustable, Positive	Bulk	Active
TO-92	LM317LTA	100mA, Adjustable, Positive	Tape	Active
SOT-89	LM317LF	100mA, Adjustable, Positive	Reel	Active
SOP-8	LM317LD	100mA, Adjustable, Positive	Reel	Active



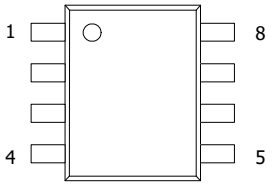
PIN CONFIGURATION



TO-92



SOT-89

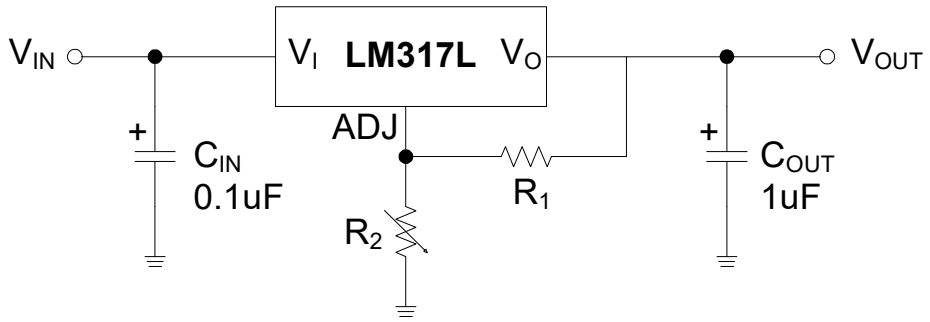


SOP-8

PIN DESCRIPTION

PIN NO.	TO-92 / SOT-89 3 LEAD		SOP-8 8LEAD	
	NAME	FUNCTION	NAME	FUNCTION
1	ADJ	Adjustable	V_{IN}	Input Voltage
2	V_{OUT}	Output Voltage	V_{OUT}	Output Voltage
3	V_{IN}	Input Voltage	V_{OUT}	Output Voltage
4	-	-	ADJ	Adjustable
5	-	-	-	N.C.
6	-	-	V_{OUT}	Output Voltage
7	-	-	V_{OUT}	Output Voltage
8	-	-	-	N.C.

TYPICAL APPLICATION



$$V_{OUT} = 1.25V(1+R_2/R_1)+I_{ADJ}R_2$$

Note 1. C_{IN} is required when regulator is located in appreciable distance from power supply filter.
Note 2. C_{OUT} is not needed for stability, however, it does improve transient response.
Note 3. I_{ADJ} is controlled to less than 100uA, the error associated with this term is negligible in most applications.

REVISION NOTICE

The description in this datasheet is subject to change without any notice to describe its electrical characteristics properly.