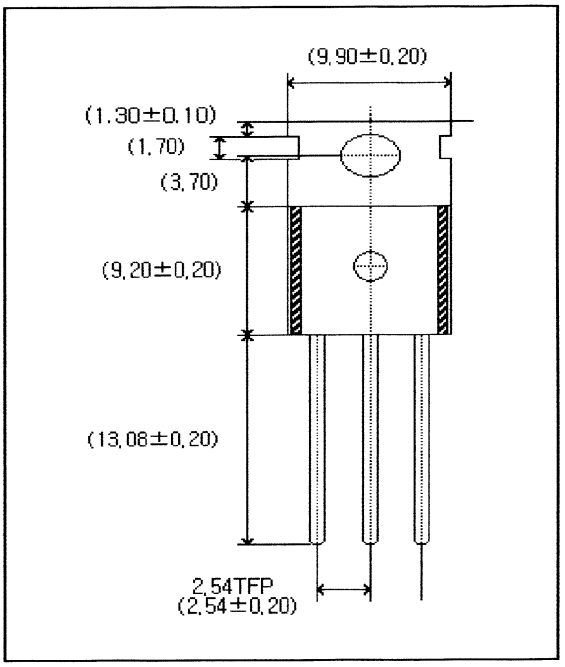
3-TERMINAL 1A POSITIVE ADJUSTABLE REGULATOR

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.



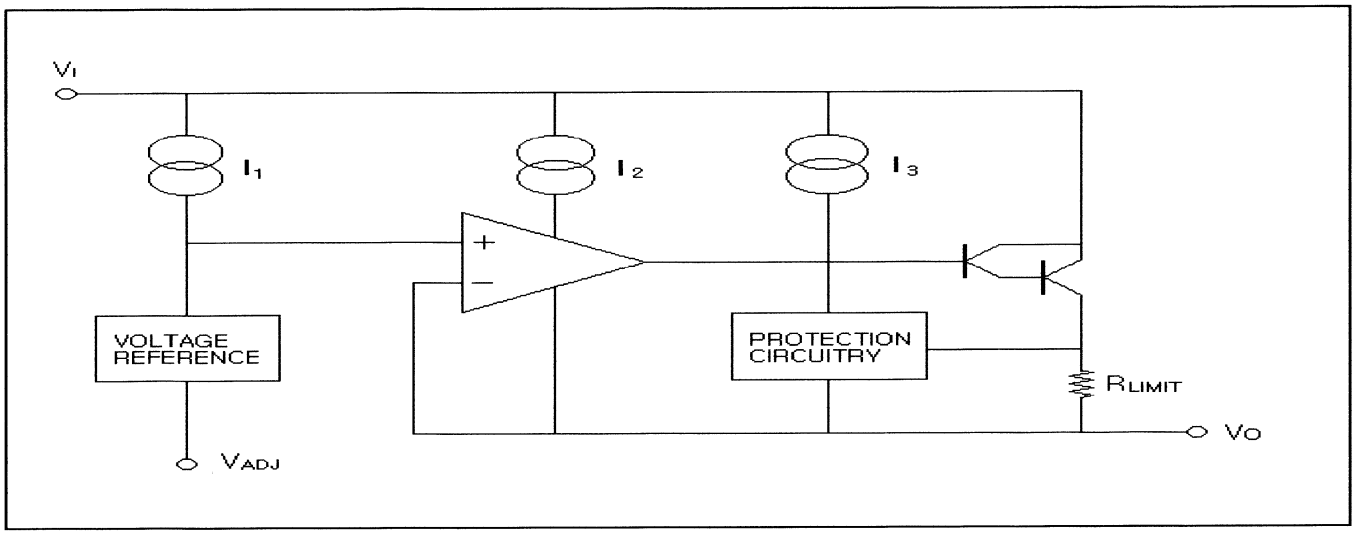
FEATURES

◇ Output current in Excess of 1.5A
◇ Output Adjustable Between 1.2V and 37V
◇ Internal Thermal-Overload Protection
◇ Internal Short-Circuit Current-Limiting
◇ Output Transistor Safe-Area Compensation

ORDERING INFORMATION

Device	Package	Operating Temperature
LM317	TO-220	0℃ ~ 125℃

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_A=25℃, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Input-output Voltage Differential	V_I-V_O	40	V
Lead Temperature	T_{LEAD}	230	℃
Power Dissipation	P_D	Internally limited	–
Operating Temperature Range	T_{OPR}	0 ~ +125	℃
Storage Temperature Range	T_{STG}	−65 ~ +125	℃

ELECTRICAL CHARACTERISTICS

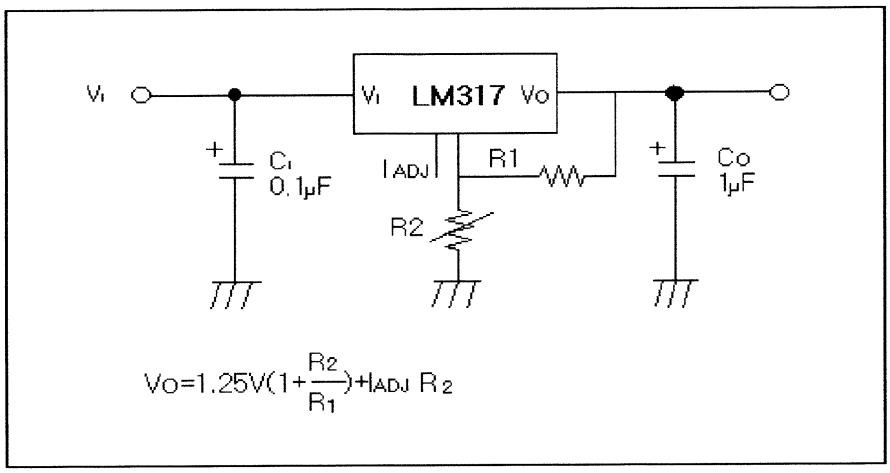
(V_I-V_O=5V, I_O=0.5A, 0℃≤T_J≤125℃, I_{MAX}=1.5A, P_{MAX}=20W, unless otherwise specified)

Characteristic	Symbol	Test condition	Min.	Typ.	Max.	Unit
Line Regulation	△Vo	T_A=0 ~ 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	T_A=25℃, 10mA≤I_O≤I_{MAX}				
		Vo≤6V		18	25	mV
		Vo≥5V		0.4	0.5	%/Vo
		10mA≤I_O≤I_{MAX}				
		Vo≤5V		40	70	mV
		Vo≥5V		0.8	1.5	%/Vo
Adjustable Pin Current	I_{ADJ}			46	100	μA
Adjustable Pin Current Change	△I_{ADJ}	3V≤V_I-V_O≤40V, 10mA≤I_O≤I_{MAX}, P≤P_{MAX}		2.0	5	μA
Reference Voltage	V_{REF}	3V≤$V_{IN}-V_{OUT}$≤40V, 10mA≤I_O≤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	$I_{L(MIN)}$	V_I-V_O=40V		3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	V_I-V_O≤15V, P_D≤P_{MAX}	1.5	2.2		A
		V_I-V_O≤40V, P_D≤P_{MAX}, T_A=25℃	0.156	0.4		
RMS Noise, % of V_{OUT}	e_N	T_A=25℃, 10Hz≤f≤10KHz		0.003	0.01	%/Vo
Ripple Rejection	RR	Vo=10V, f=120Hz, without C_{ADJ}		60		dB
		C_{ADJ}=10 μF	66	75		
Long-Term Stability, T_J=T_{HIGH}	ST	T_A=25℃, for end point measurements, 1000HR		0.3	1	%
Thermal Resistance Junction to Case	$R_{\Theta JC}$			5		℃W

* Load and line regulation are specified at constant junction temperature. Change in V due to heating effects must be taken into account separately. Pulse testing with low duty is used.(P_{MAX}=20W)

TYPICAL APPLICATIONS

Fig.5 Programmable Regulator



C_I is required when regulator is located in appreciable distance from power supply filter.
Co 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.