鼎德丰 DING DE FENG

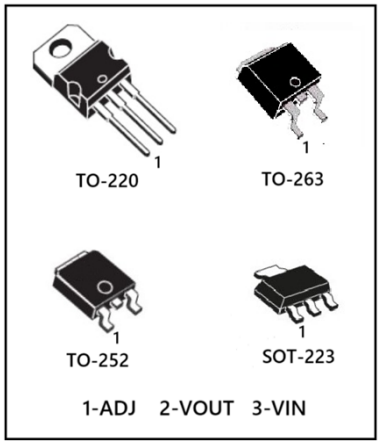
3-Terminal Positive
Adjustable Regulator

LM317

Description

The LM317 is adjustable 3-terminal positive voltage regulator capable of supplying in excess of 1.5 A over an output voltage range of 1.2 V to 37 V. These voltage regulator is exceptionally easy to use and require only two external resistors to set the output voltage. Further, it employ internal current limiting, thermal shutdown and safe area compensation, making them essentially blow-out proof.

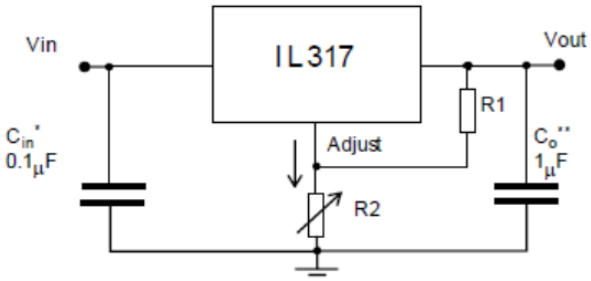
The LM317 serve a wide variety of applications to make a programmable output regulator, or by connecting a fixed resistor between the adjustment and output, the LM317 series can be used as a precision current requlator.



Features

- Output Voltage Range Adjustable from 1.2V to 37V
- Output Current Capability of 1.5A Max
- Internal Thermal Overload Protection
- Internal Short - Circuit Current Limiting Constant with Temperature
- Output Transistor Safe-Area Compensation
- Floating Operation for High Voltage Applications
- Eliminates Stocking Many Fixed
- Popular 3-Lead TO-220、TO-263、TO-252 and SOT-223Package

Standard application



$$Vout = 1.25V(1+\frac{R2}{R1}) + I_{ADJ} * R2$$

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input-output differential voltage	V_I-V_O	40	V
Power dissipation	P_D	Internally Limited	W
Operating junction temperature range	T_j	-40 ~ +150	℃
Storage temperature range	T_{STG}	-65 ~+150	℃

Tehermal Data

Parameter	Symbol	TO-220	TO-263	TO-252	SOT-223	UNIT
Thermal resistance junction-case	R_{thJC}	5.5	5.5	14.5	27	°C/W
Thermal resistance junction-ambient	R_{thJA}	67	62.5	80	100	°C/W

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Input-to-output voltage differential	$V_I - V_O$	3	37	V
Output current	I_O	10	1.5	A
Operating virtual junction temperature	T_J	0	125	°C

Electrical characteristics

(VI - VO = 5V, IO = 500mA, TJ = Tlow to Thigh (1) ; Imax = 1.5 A and Pmax = 20 W unless otherwise noted)

Parameter	Symbol	Test conditions			Min	Typ	Max	Unit
Reference Voltage(4)	V_{REF}	3.0V≤ VI-Vo ≤40V 10mA≤ Io ≤1.5A, PD ≤ Pmax			1.2	1.25	1.3	V
Line Regulation	Regline	3.0V≤VI-Vo≤40V		T_A=25°C		0.01	0.04	%/V
		3.0V≤VI-Vo≤40V, l0 =10mAto 1.5A		（3）		0.02	0.07	
Load Regulation	Regload	10mA≤Io≤1.5A(3)	VO ≤ 5.0V	T_A=25°C		5.0	25	mV
			VO≥ 5.0V			0.1	0.5	%/V
			VO ≤ 5.0V	（3）		20	70	mV
			VO≥ 5.0V			0.3	1.5	%/V
Adjustment Pin Current	IAdj					50	100	μA
Adjustment Pin Current Change	ΔIAdj	2.5V≤ VI-Vo ≤40V 10mA≤ Io ≤1.5A, PD ≤Pmax				0.2	5.0	μA
Maximum Output Current	$I_{O\,MAX}$	VI - VO ≤ 15 V, PD ≤ 20W			1.5	2.2		A
		VI - VO ≤ 40 V, PD ≤20W		T_A=25°C	0.15	0.4		
Minimum Load Current to Maintain Regulation	$I_{L\,MIN}$	VI-Vo =40V				3.5	10	mA
RMS Noise, % of VO	N	T_A = 25°C, 10 Hz ≤ f ≤ 10 kHz				0.003		% V
Output voltage long-term drift(6)	ST	After 1000 h at TJ = MAX and VI-Vo = 40V				0.3	1	%
Ripple Rejection（5）	RR	Vo=10V, f=120Hz	CAdj=0uF			65		dB
			CAdj=10uF		66	80		

NOTES:

(1) Tlow = 0 °C , Thigh = +125 °C

(2) Imax = 0.5 A , Pmax

(3) Load and line regulation are specified at constant junction tempereture. Changes in Vo due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

(4) Selected devices with tightened tolerance reference voltage available.

(5) Cadj , when used, connected between the adjustment pin and ground.

(6) Since Long - Term Stability cannot be measured on each device before shipment, this specification is an engineering estimate of average stability from lot to lot.