

## Features

- Output current greater than 1.5A
- Range Output voltage range adjustable from 1.25V to 37V

## Applications

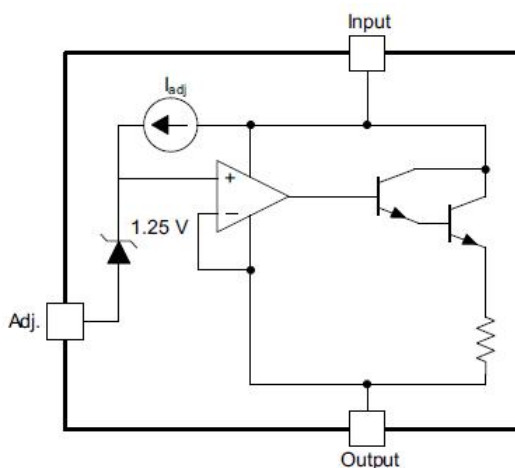
- Power Management for Computer Mother Board, Graphic Card
- LCD Monitor and LCD TV
- DVD Decode Board
- ADSL Modem
- Post Regulators for Switching Supplies

## General Description

The **LM317** device is an adjustable three-terminal positive-voltage regulator capable of supplying more than 1.5A over an output-voltage range of 1.25V to 37V. **LM317** features a very low standby current 1.5mA .

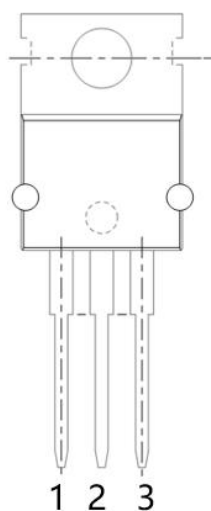
LM317 is available in TO220 and SOT223 package.

## Block Diagram



## Pin Configuration

TO220 Top View



SOT223 (Top View)



Table1: ~~LM317~~ series (TO220 PKG)

PIN NO.	PIN NAME	FUNCTION
1	ADJ	ADJ pin
2	VOUT	Output voltage pin
3	VIN	Input voltage pin

Table2: LM317 series (SOT223 PKG)

PIN NO.	PIN NAME	FUNCTION
1	ADJ	ADJ pin
2	VOUT	Output voltage pin
3	VIN	Input voltage pin
4	VOUT	Output voltage pin

## Absolute Maximum Ratings

Max Input Voltage..... 40V

Max Operating Junction Temperature(Tj)..... 150°C

Ambient Temperature(Ta)..... -20°C~ 85°C

Storage Temperature(Ts)..... -40°C~150°C

Caution: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

## Thermal Information

Symbol	Parameter	TO220	UNIT
$R_{\theta(JA)}$	Junction-to-ambient thermal resistance	37.9	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	51.1	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	23.2	°C/W
$\Psi_{JT}$	Junction-to-top characterization parameter	13.0	°C/W
$\Psi_{JB}$	Junction-to-board characterization parameter	22.8	°C/W
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	4.2	°C/W

## Electrical Characteristics

T<sub>A</sub>=25°C, unless otherwise noted.

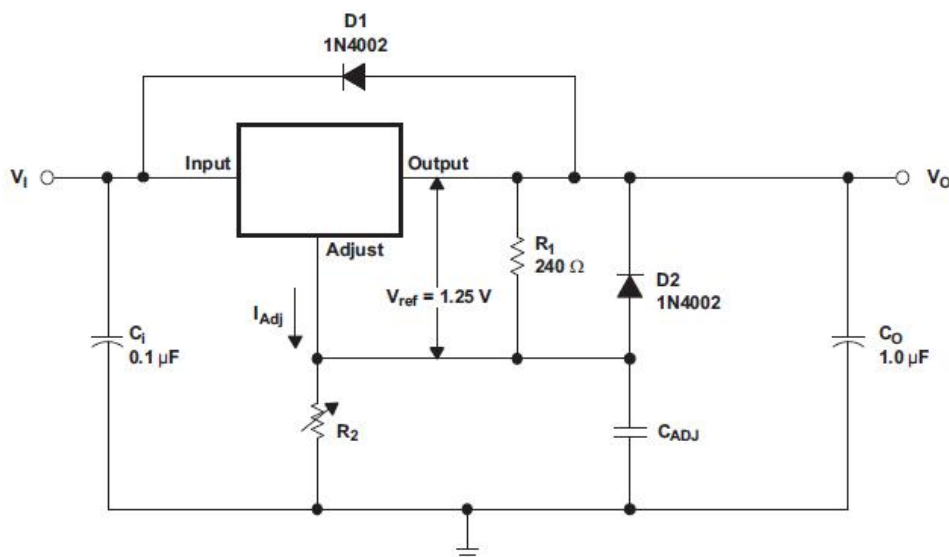
Parameter	Test Conditions		Min	Typ	Max	Unit
Line regulation	V <sub>I</sub> -V <sub>O</sub> =3V to 40V	T <sub>J</sub> =25°C	-5	--	5	mV
Load regulation	I <sub>O</sub> =10mA to 1500mA		-25	--	25	mV
Reference voltage	V <sub>I</sub> - V <sub>O</sub> =3V to 40V, P <sub>D</sub> ≤20W, I <sub>O</sub> =10mA to 1.5A		1.2	1.25	1.3	V
Output-voltage Temperature stability	T <sub>J</sub> = 0°C to 125°C			0.7		%V <sub>O</sub>
Maximum output current	V <sub>I</sub> - V <sub>O</sub> ≤ 15V, T <sub>J</sub> =25°C		1.5	2		A

## Detailed Description

LM317 device is an adjustable three-terminal positive-voltage regulator capable of supplying up to 1.5A over an output-voltage range of 1.25V to 37V. It requires only two external resistors to set the output voltage. The device features a typical line regulation of 1mV and typical load regulation of 7 mV.

The LM317 device is versatile in its applications, including uses in programmable output regulation and local on-card regulation. Or, by connecting a fixed resistor between the ADJUST and OUTPUT terminals, the LM317 device can function as a precision current regulator. An optional output capacitor can be added to improve transient response.

## Typical Application

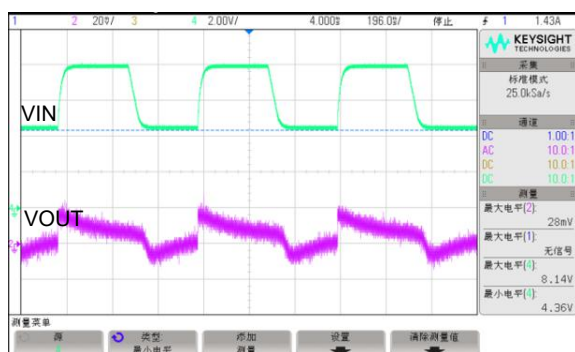


Adjustable Voltage Regulator

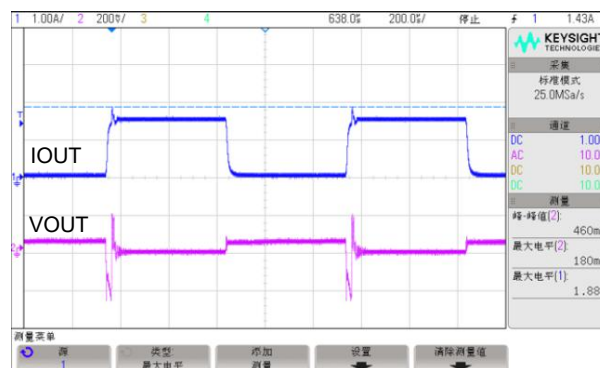
1. R1 and R2 are required to set the output voltage.
2. C<sub>ADJ</sub> is recommended to improve ripple rejection. It prevents amplification of the ripple as the output voltage is adjusted higher.
3. C<sub>I</sub> is recommended, particularly if the regulator is not in close proximity to the power-supply filter capacitors. A 0.1μF or 1μF ceramic or tantalum capacitor provides sufficient bypassing for most applications, especially when adjustment and output capacitors are used.
4. C<sub>O</sub> improves transient response, but is not needed for stability.
5. Protection diode D2 is recommended if C<sub>ADJ</sub> is used. The diode provides a low-impedance discharge path to prevent the capacitor from discharging into the output of the regulator.
6. Protection diode D1 is recommended if C<sub>O</sub> is used. The diode provides a low-impedance discharge path to prevent the capacitor from discharging into the output of the regulator.
7. V<sub>O</sub> is calculated as shown:  $V_O = V_{REF}(1 + R_2/R_1) + (I_{ADJ} \times R_2)$ , I<sub>ADJ</sub> is typically 50μA and negligible in most applications.

## Typical Performance Characteristics

### Line Transient Response

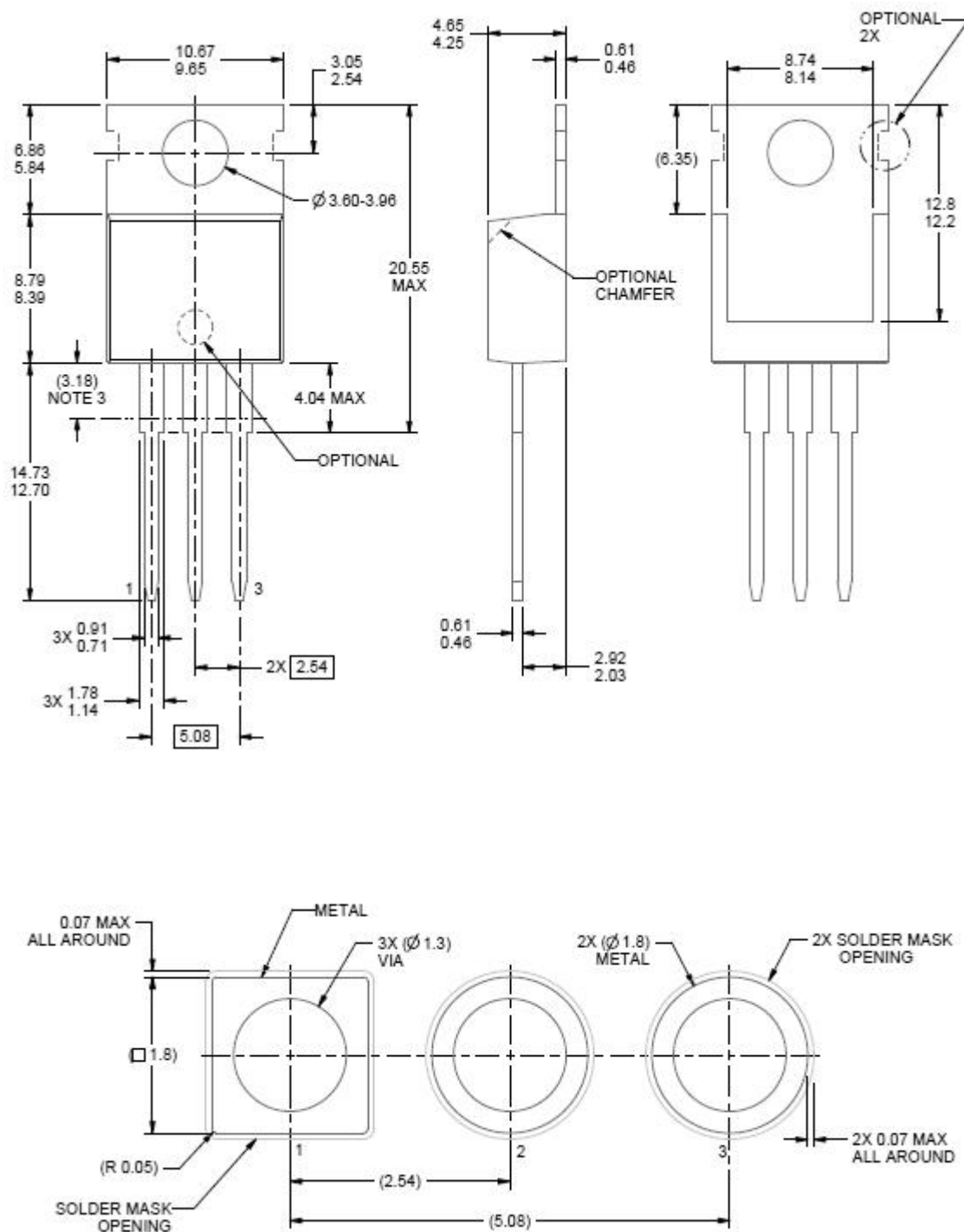


### Load Transient Response

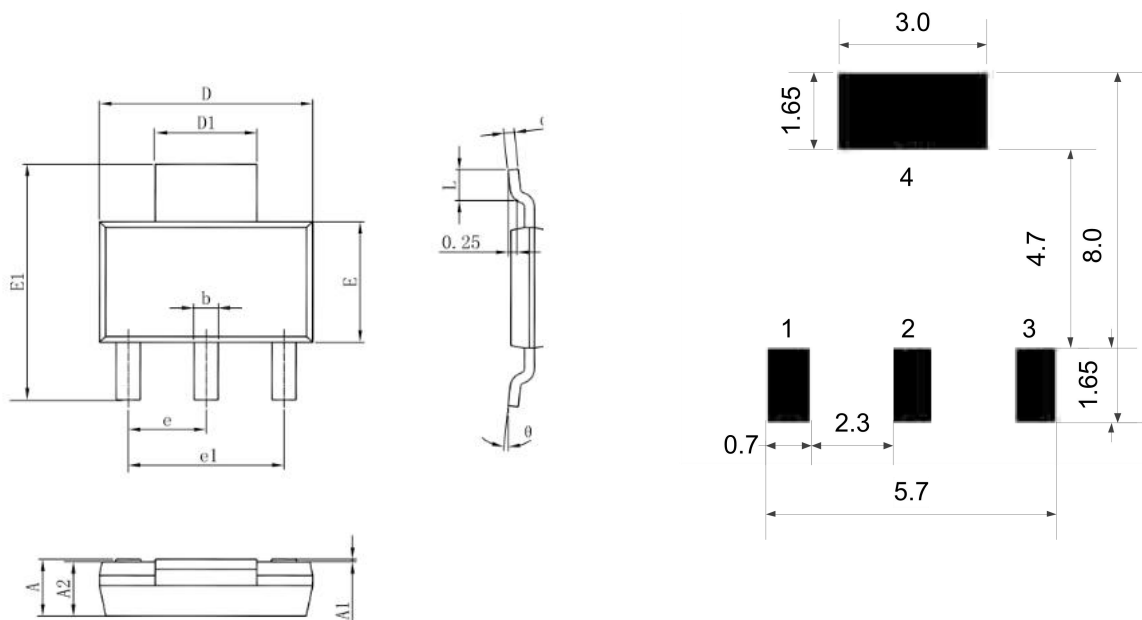


## Package Information

## TO220 Package



SOT223 Package



PCB Board

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°