

**Features**

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

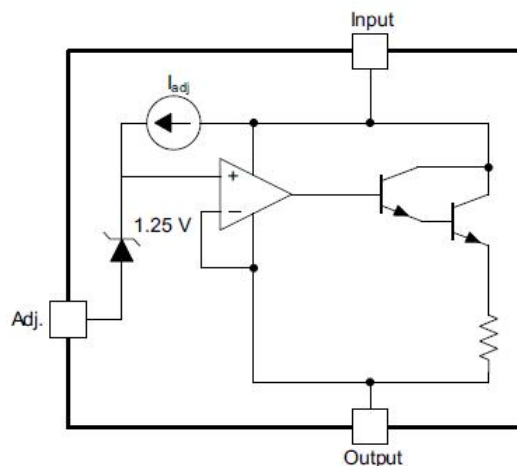
**Applications**

- 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**

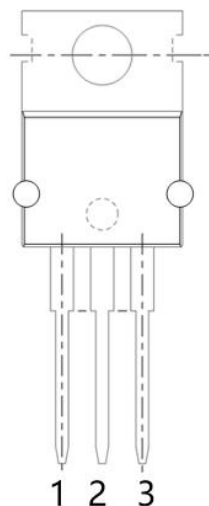
The LM317 device is an adjustable three-terminal positive-voltage regulator capable of supplying more than 1.5A over an output-voltage range of 1.25V to 37V. LM317 features a very low standby current 1.5mA .

LM317 is available in TO220 and SOT223 package.

**Block Diagram**

## Pin Configuration

TO220 Top View



SOT223 (Top View)



Table1: LM 317 series (TO220 PKG)

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

Table2: LM 317 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( $T_J$ )..... 150°C

Ambient Temperature( $T_a$ )..... -20°C~85°C

Storage Temperature( $T_s$ )..... -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

$T_A=25^{\circ}\text{C}$ , unless otherwise noted.

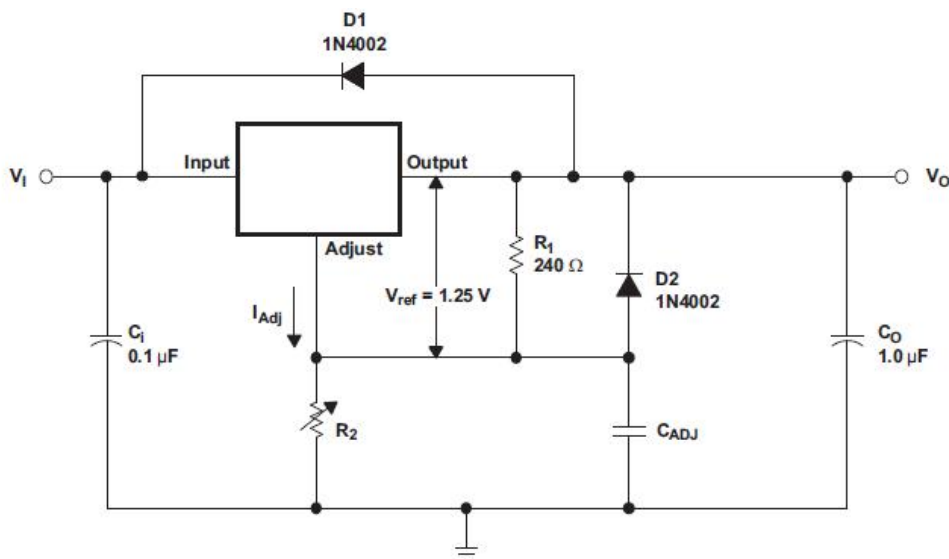
Parameter	Test Conditions		Min	Typ	Max	Unit
Line regulation	$V_I-V_O=3\text{V to }40\text{V}$	$T_J=25^{\circ}\text{C}$	-5	--	5	mV
Load regulation	$I_O=10\text{mA to }1500\text{mA}$		-25	--	25	mV
Reference viltage	$V_I-V_O=3\text{V to }40\text{V}$ , $P_D\leq 20\text{W}$ , $I_O=10\text{mA to }1.5\text{A}$		1.2	1.25	1.3	V
Output-voltage Temperature stability	$T_J=0^{\circ}\text{C to }125^{\circ}\text{C}$			0.7		% $V_O$
Maximum output current	$V_I-V_O\leq 15\text{V}$ , $T_J=25^{\circ}\text{C}$		1.5	2		A

### Detailed Description

LM 317 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 ouput voltage. The device features a typical line regulation of 1mV and typical load regulation of 7 mV.

The LM 317 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 LM 317 device can function as a precision current regulator. An optional output capacitor can be added to improve transient response.

### Typical Application

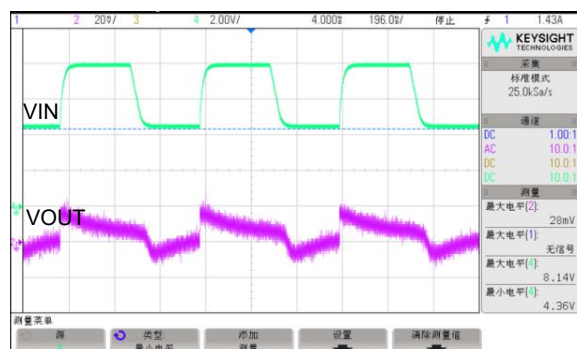


Adjustable Voltage Regulator

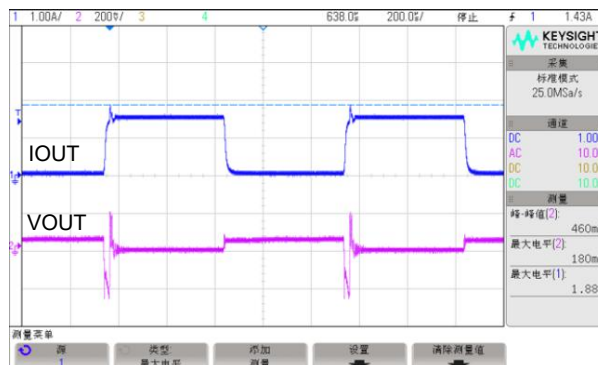
1. R<sub>1</sub> and R<sub>2</sub> are required to set the output voltage.
2. C<sub>ADJ</sub> is recommended to improve ripple rejection. It prevents amplification of the ripple as the output voltage is adjusted higher.
3. C<sub>I</sub> is recommended, particularly if the regulator is not in close proximity 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 D<sub>2</sub> 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 D<sub>1</sub> 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

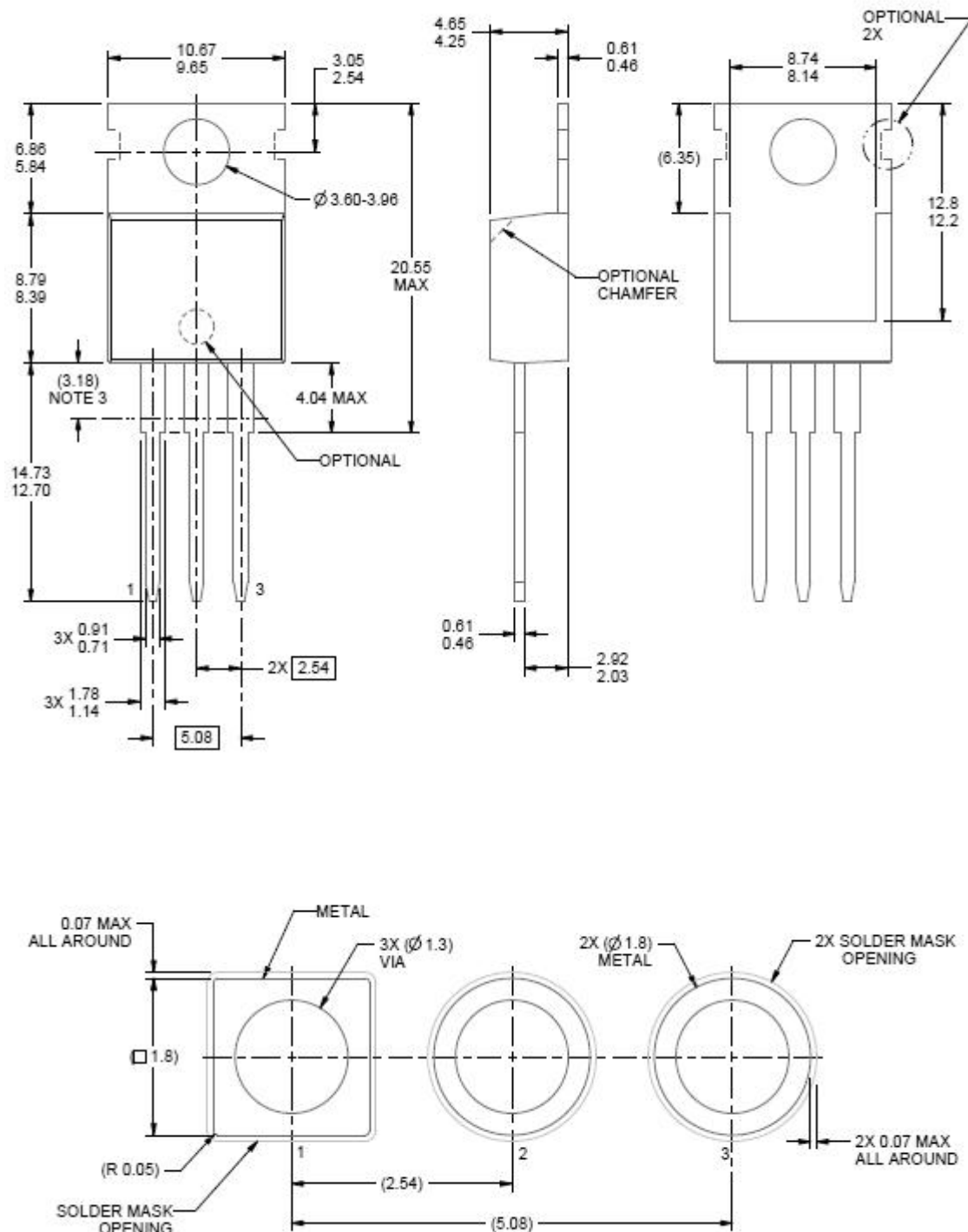


Load Transient Response

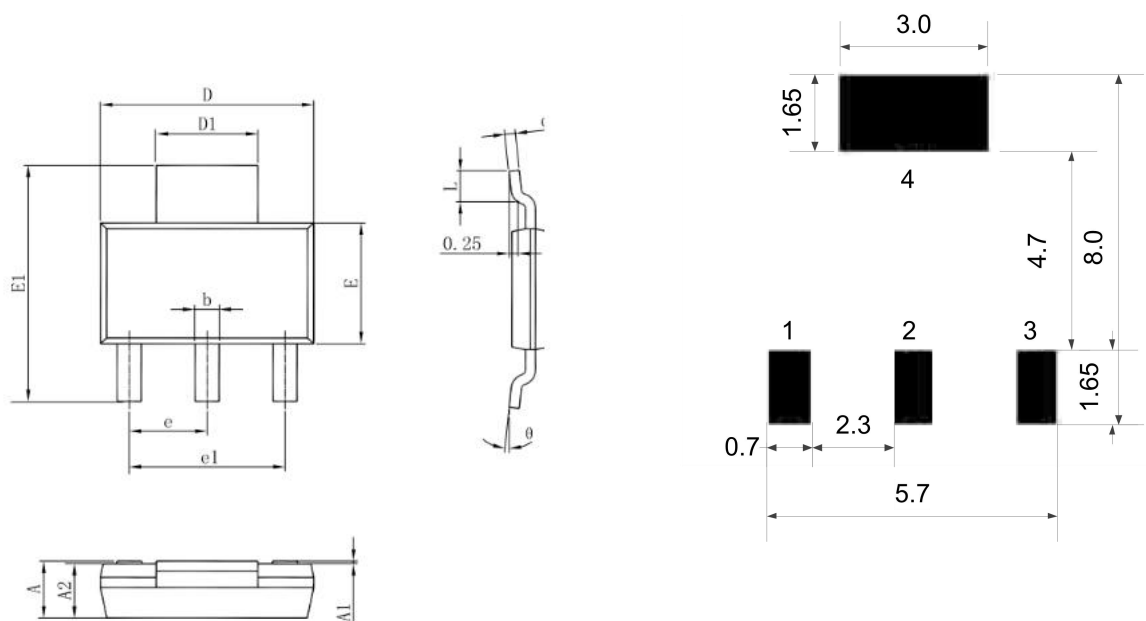


### Package Information

#### 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°