



## HIGH CURRENT ADJUSTABLE VOLTAGE REGULATOR LM317EMP / T / MDT / S

### DESCRIPTION

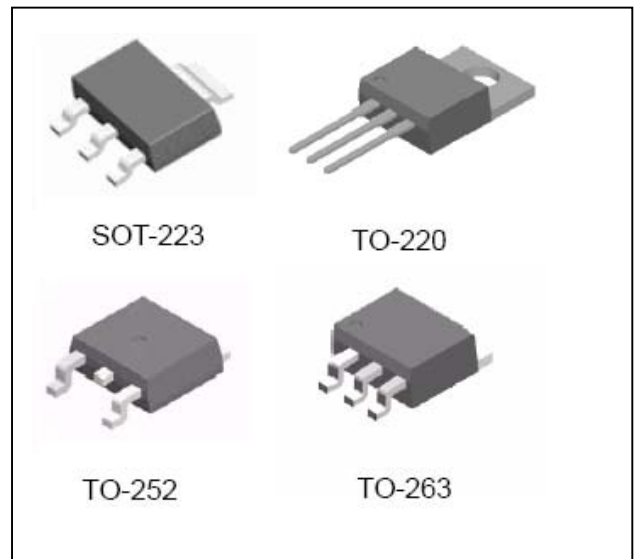
The LM317 is an adjustable 3-terminal positive voltage regulator, designed to supply 1A of output current with voltage adjustable from 1.3V ~ 37V.

### FEATURES

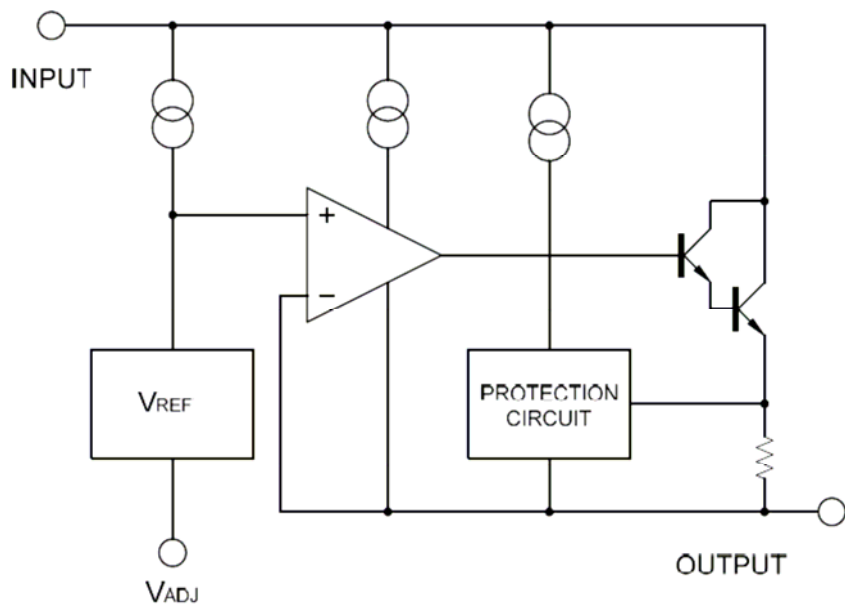
- Typical 1% Output Voltage Tolerance
- Output voltage adjustable from 1.3V ~ 37V
- Output current in excess of 1A
- Internal short circuit protection
- Internal over temperature protection
- Output transistor safe area compensation

### APPLICATIONS

- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD Player
- Network Interface Card/Switch
- Telecom Equipment
- Printer and other Peripheral Equipment



**BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS** ( $T_a=25^{\circ}\text{C}$ ) \*

Characteristic	Symbol	Min.	Max.	Unit
Input - Output Voltage Difference	$V_{in}-V_{out}$		40	V
Power Dissipation	$P_d$	Internal limited		
Maximum junction temperature	$T_J$		150	$^{\circ}\text{C}$
Storage temperature	$T_S$	-40	150	$^{\circ}\text{C}$
Lead temperature (soldering, 10sec)	$T_{LEAD}$		260	$^{\circ}\text{C}$
ESD (human body model)	ESD		4000	V

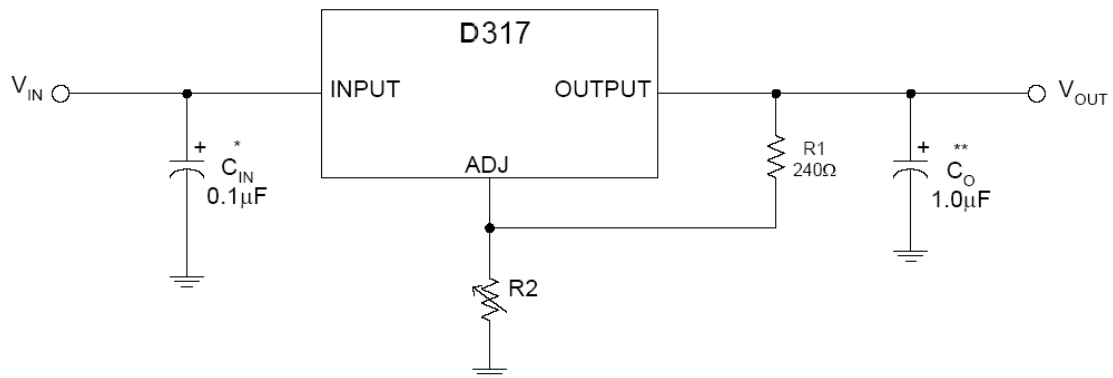
\*: Absolute maximum ratings are stress ratings only and functional device operation is not implied. The device could be damaged beyond Absolute maximum ratings.

**ELECTRICAL CHARACTERISTICS** ( $V_{IN}-V_{OUT}=5V$ ,  $I_{OUT}=10mA$ ,  $T_a=25^{\circ}C$ , unless otherwise specified. ) \*

Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Reference voltage	$10mA \leq I_{OUT} \leq 1A$ $3V \leq (V_{IN}-V_{OUT}) \leq 40V$ $PD \leq 20W$	$V_{REF}$	1.20	1.25	1.30	V
Line regulation	$3V \leq V_{IN}-V_{OUT} \leq 40V$	$S_V$		0.01	0.04	%/V
Load regulation	$0mA \leq I_{OUT} \leq 1A$	$S_i$		0.2	0.4	%
Adjust pin current		$I_{adj}$		50	100	$\mu A$
Adjust pin current change	$3V \leq V_{IN}-V_{OUT} \leq 40V$ , $10mA \leq I_{OUT} \leq 1A$ , $PD \leq 20W$	$\Delta I_{adj}$		0.2	5.0	$\mu A$
Minimum load current	$V_{IN}-V_{OUT}=40V$	$I_{Lmin}$		3.5	10.0	mA
Ripple rejection	$f=120Hz$ , $C_{OUT}=1\mu F$ tantalum, $(V_{IN}-V_{OUT})=3V$ , $I_{OUT}=1A$	RR	60	75		dB
Temperature stability	$T_{MIN} \leq T_J \leq T_{MAX}$			0.7		%
RMS output noise (% of $V_{OUT}$ )	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 10kHz$	$e_n$		0.003		%
Thermal resistance, Junction to case	SOT-223 TO-252 TO-220 TO-263	$\theta_{JC}$		23 12 5 5		$^{\circ}C/W$
Thermal resistance, Junction to Ambient	SOT-223 TO-252 TO-220 TO-263	$\theta_{JA}$		165 112 54 64		$^{\circ}C/W$
Thermal shutdown hysteresis		$Thys$		25		$^{\circ}C$

\*: Maximum Power Dissipation is Package Type and Case Temperature dependent.

## APPLICATION CIRCUIT



\* =  $C_{IN}$  is required if the regulator is located near power supply filter.

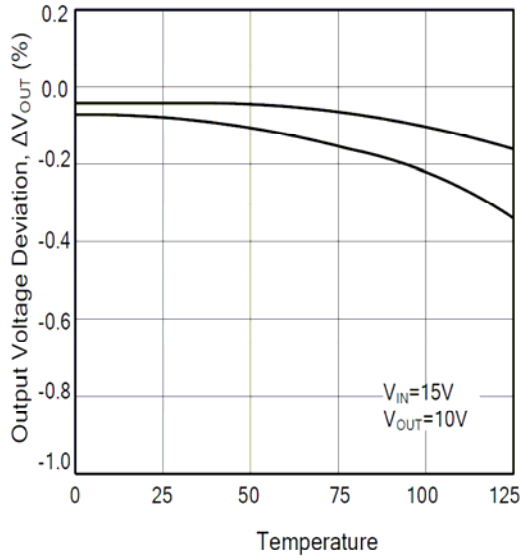
\*\* =  $C_O$  is needed for stability and it improves transient response.

$$V_{OUT} = V_{REF} \times (1 + R2/R1) + I_{ADJ} \times R2$$

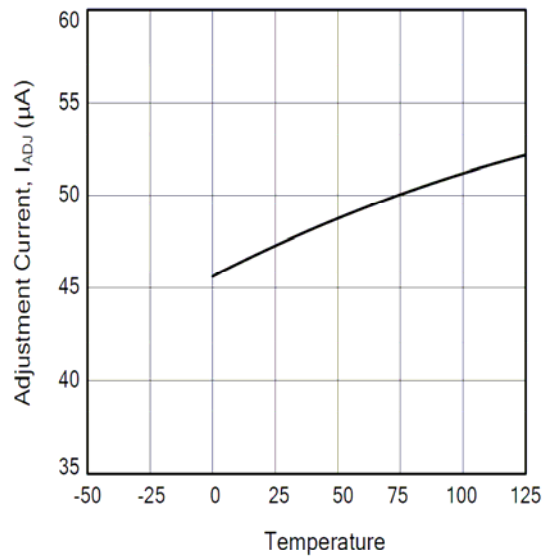
Since  $I_{ADJ}$  is controlled to less than 100  $\mu A$ , the error associated with this term is negligible in most applications.

CHARACTERISTICS CURVES

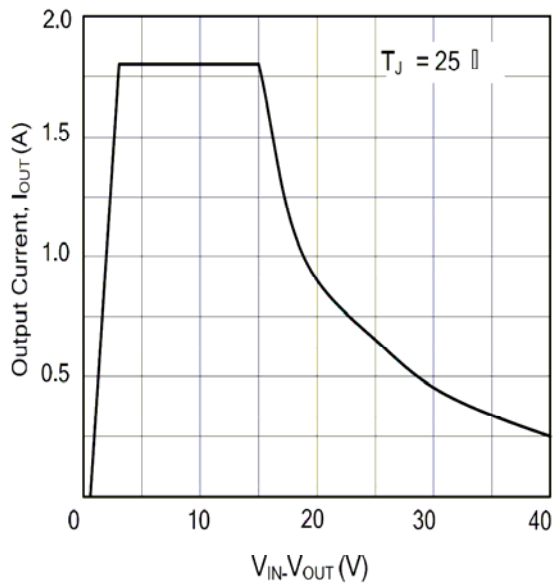
Load Regulation vs. temperature



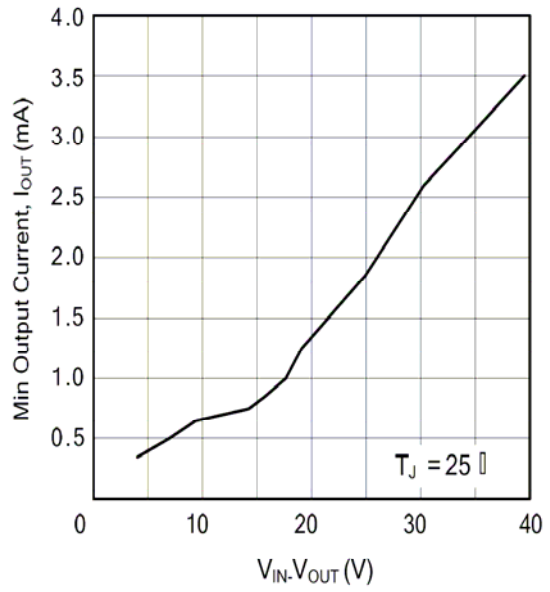
Adjustment Current vs. Temperature



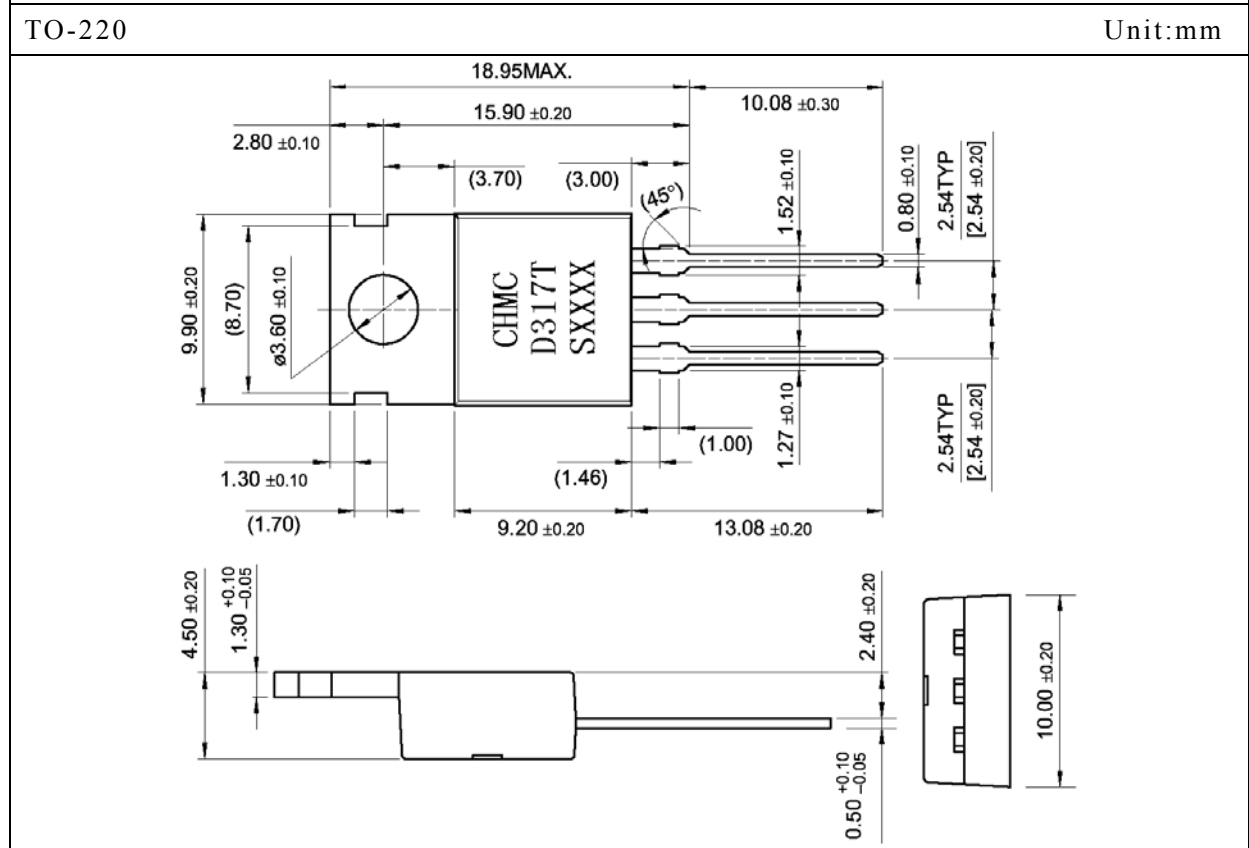
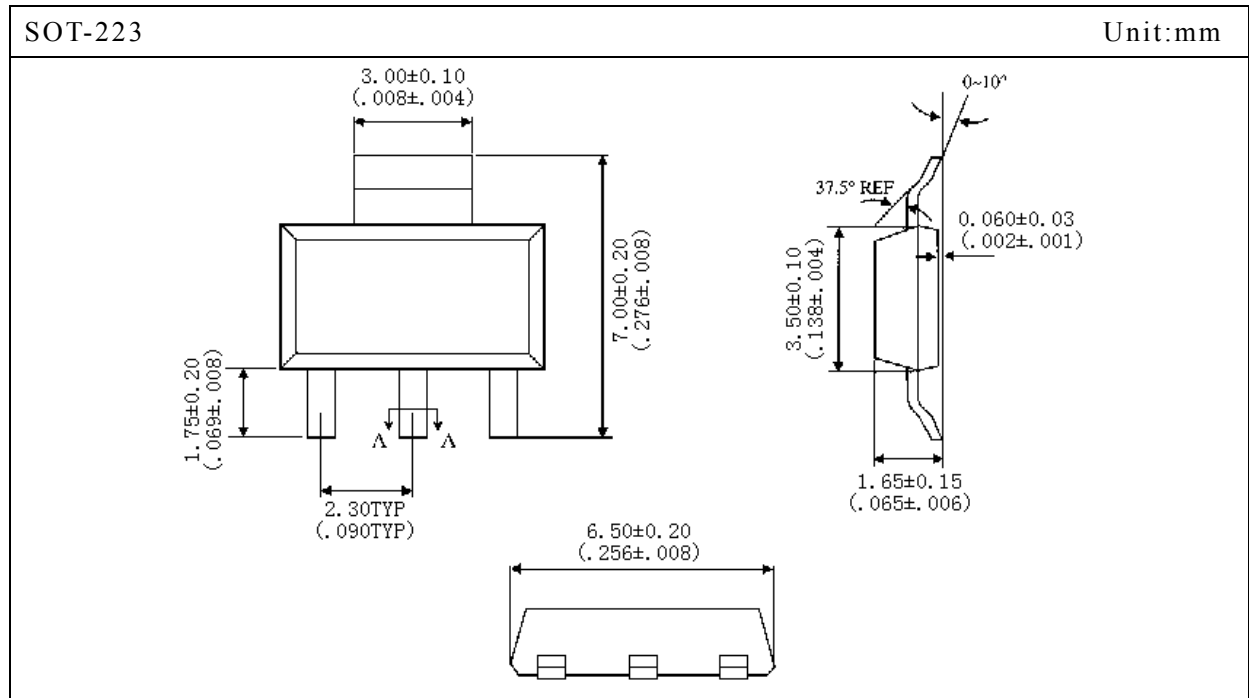
Current Limit



Minimum Operating Current

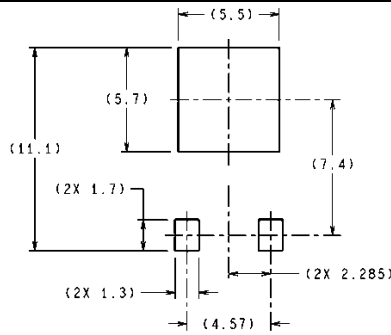


OUTLINE DRAWING



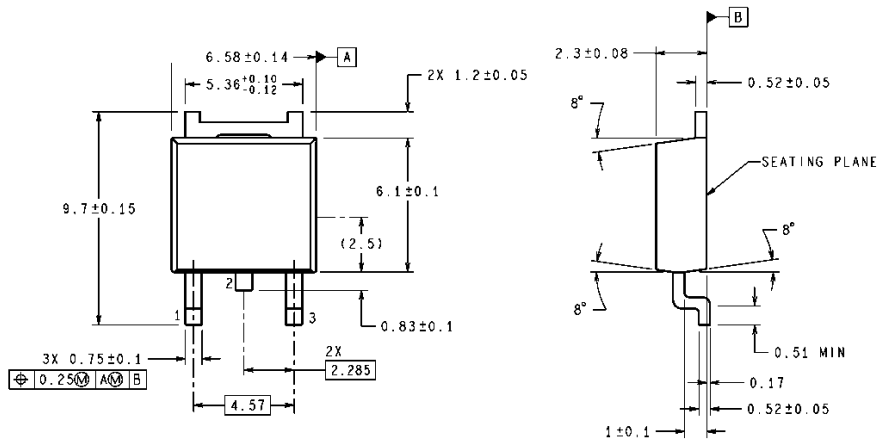
TO-252

Unit:mm



DIMENSIONS ARE IN MILLIMETERS

LAND PATTERN RECOMMENDATION



TO-263

Unit:mm

