

**TAITRON**

components incorporated

**100mA Adjustable Positive Voltage Regulator****LA317L****100mA Adjustable Positive Voltage Regulator****General Description**

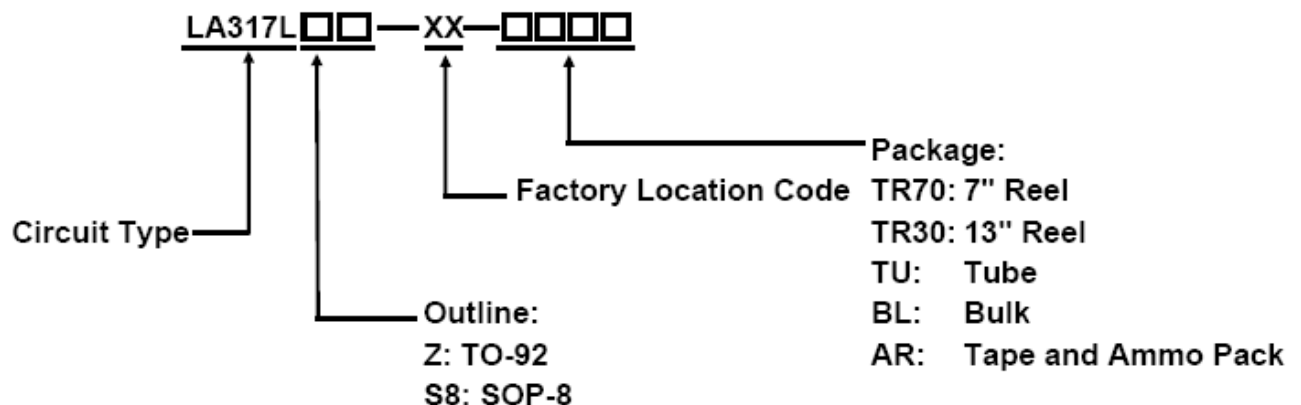
- The LA317L is an adjustable 3-terminal positive voltage regulator capable of supplying 100mA over a 1.2V to 12V output range. This voltage regulator is exceptionally easy to use and requires only two external resistors to set the output voltage.
- The LA317L is available in standard TO-92 and SOP-8 packages.

**TO-92****SOP-8****Features**

- Adjustable output down to 1.2V
- Guaranteed 100mA output current
- Output short circuit protected
- Line regulation: 0.01%/V
- Load regulation: 0.1%
- Constant current limit over temperature
- Standard 3-lead transistor package
- Input ripple rejection: 70dB
- RoHS Compliance

**Applications**

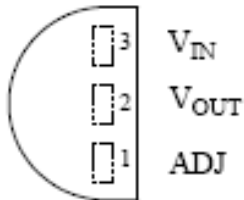
- High Efficiency Linear Regulators
- Post Regulation for Switching Supplies
- Microprocessor Power Supply
- Mother Board I/O Power Supply

**Ordering Information**

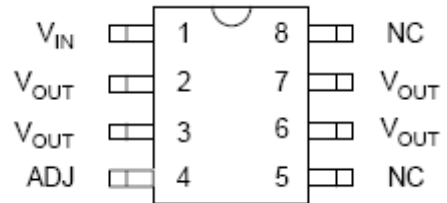
# 100mA Adjustable Positive Voltage Regulator

## LA317L

### Pin Configuration

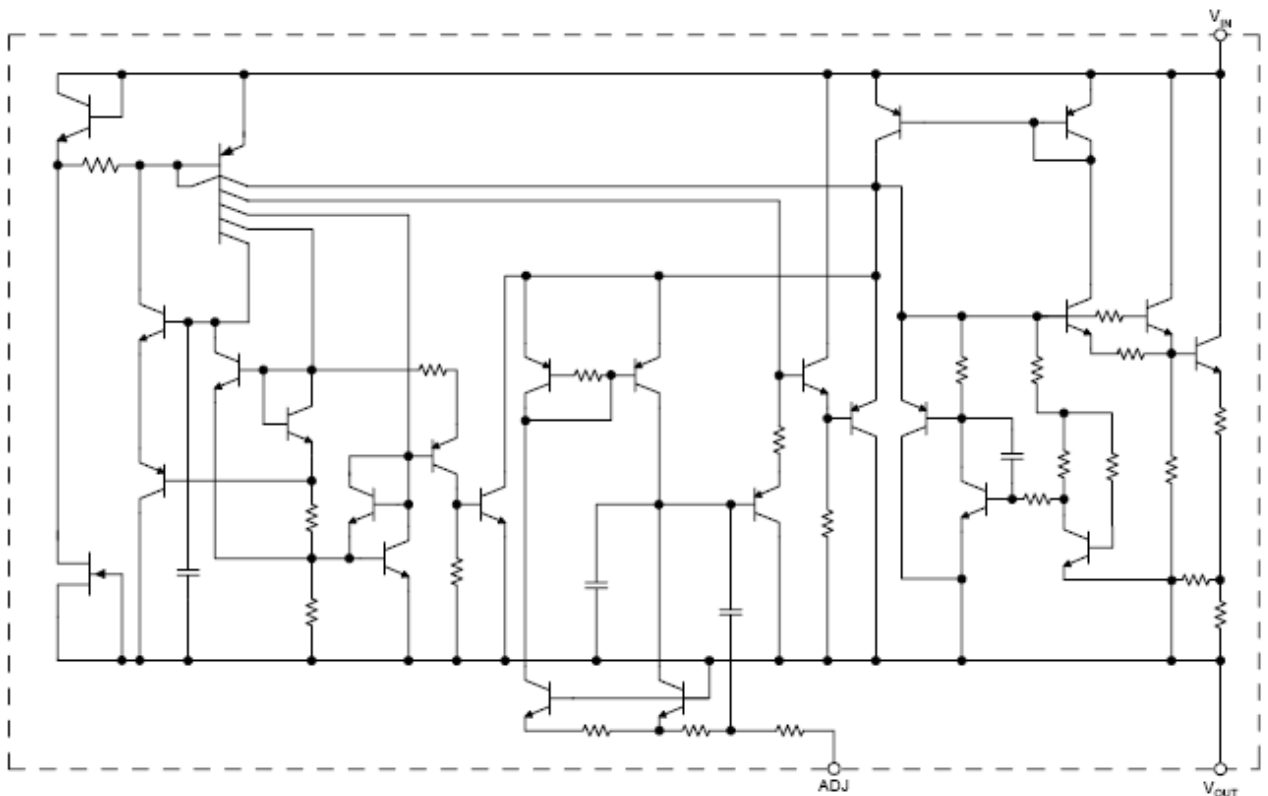


Outline: Z  
TO-92



Outline: S8  
SOP-8

### Block Diagram



# 100mA Adjustable Positive Voltage Regulator

## LA317L

### Absolute Maximum Ratings (Ta=25° C, unless otherwise specified)

Symbol	Description	Ratings	Unit
V <sub>IN-VOUT</sub>	Input - Output Voltage Differential	40	V
I <sub>O</sub>	Max. Output Current	100	mA
T <sub>J</sub>	Operating Junction Temperature	150	° C
T <sub>OPR</sub>	Operating Temperature Range	-20 ~ 85	° C
T <sub>STG</sub>	Storage Temperature Range	-65 ~ 150	° C
P <sub>D</sub>	Power Dissipation	700	mW
T <sub>LEAD</sub>	Lead Temperature (Soldering, 4sec.)	260	° C

### Electrical Characteristics

(V<sub>IN-VOUT</sub>=5V, I<sub>OUT</sub>=40mA, P<sub>D</sub>≤625mW, 0°C ≤T<sub>J</sub>≤125°C, unless otherwise specified)

Symbol	Description	LA317L			Unit	Conditions
		Min.	Typ.	Max.		
ΔV <sub>OUT</sub> /V <sub>OUT</sub>	Line Regulation	-	0.01	0.04	%V	T <sub>J</sub> =25°, 3V ≤ V <sub>IN-VOUT</sub> ≤ 15V, I <sub>OUT</sub> ≤ 20mA (Note)
		-	0.02	0.07		3V ≤ V <sub>IN-VOUT</sub> ≤ 15V, I <sub>OUT</sub> ≤ 20mA (Note)
ΔV <sub>OUT</sub>	Load Regulation	-	0.1	0.5	%	T <sub>J</sub> =25°, 5mA ≤ I <sub>OUT</sub> ≤ 100mA (Note)
		-	0.3	1.5	%	5mA ≤ I <sub>OUT</sub> ≤ 101mA (Note)
	Thermal Regulation		0.04	0.2	%/W	T <sub>J</sub> =25°, 10ms Pulse
I <sub>ADJ</sub>	Adjustable Pin Current	-	50	100	μA	-
ΔI <sub>ADJ</sub>	Adjustable Pin Current Change	-	0.2	5	μA	3V ≤ V <sub>IN-VOUT</sub> ≤ 15V, 5mA ≤ I <sub>OUT</sub> ≤ 100mA
V <sub>REF</sub>	Reference Input Voltage	1.20	1.25	1.30	V	3V ≤ V <sub>IN-VOUT</sub> ≤ 15V, 5mA ≤ I <sub>OUT</sub> ≤ 100mA
I <sub>LIMIT</sub>	Current Limit	100	200	300	mA	3V ≤ V <sub>IN-VOUT</sub> ≤ 13V
I <sub>L(MIN)</sub>	Minimum Load Current for Regulation	-	3.5	5	mA	3V ≤ V <sub>IN-VOUT</sub> ≤ 13V
PSRR	Ripple Rejection	-	62	-	dB	V <sub>OUT</sub> =10V, f=120Hz, C <sub>ADJ</sub> =0μF
		60	70	-		V <sub>OUT</sub> =10V, f=120Hz, C <sub>ADJ</sub> =10μF
-	Temperature Stability	-	0.65	-	%	0° C ≤ T <sub>J</sub> ≤ 125° C

# 100mA Adjustable Positive Voltage Regulator

## LA317L

Symbol	Description	LA317L			Unit	Conditions
		Min.	Typ.	Max.		
-	Long Term Stability	-	0.3	-	%	T <sub>J</sub> =125° C, 1000 Hours
-	RMS Output Noise (% of V <sub>OUT</sub> )	-	0.003	-	%	T <sub>J</sub> =125° C, 10Hz ≤ f ≤ 10KHz
-	Thermal Resistance Junction to Case	-	185	-	° C/W	TO-92
		-	175	-		SOP-8

**Note:** Regulation is measured at constant junction temperature, using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification of thermal regulation.

### Typical Characteristics Curves

Fig.1- Load Regulation vs. Temperature

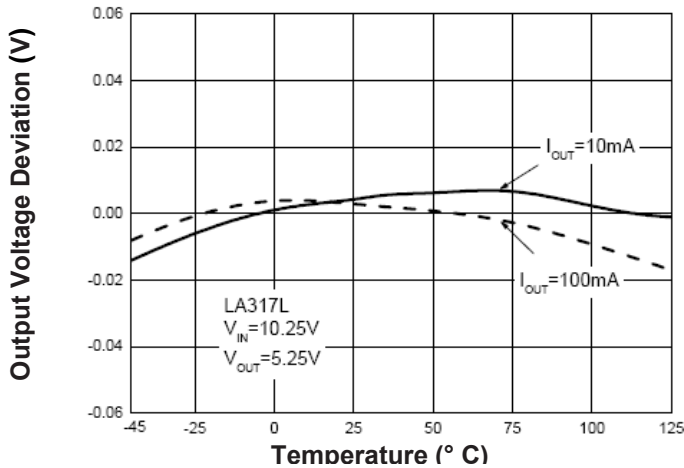


Fig.2- Output Voltage vs. Input Voltage

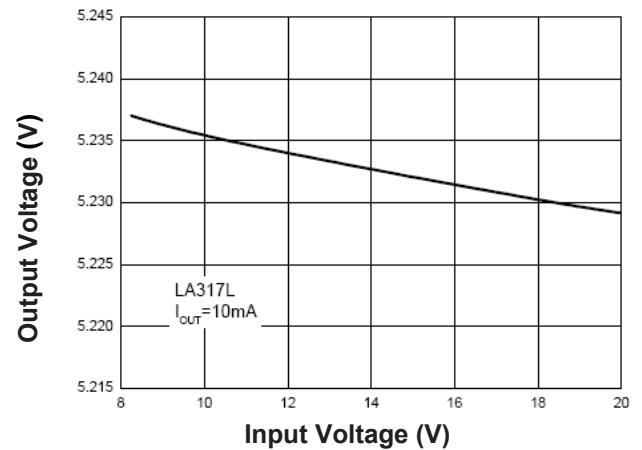


Fig.3- Reference Voltage vs. Temperature

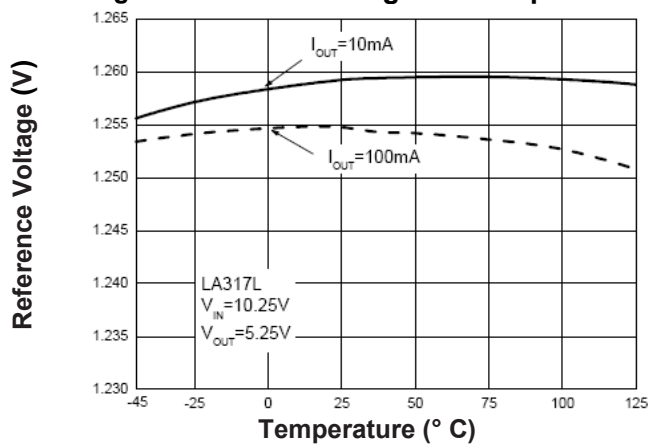
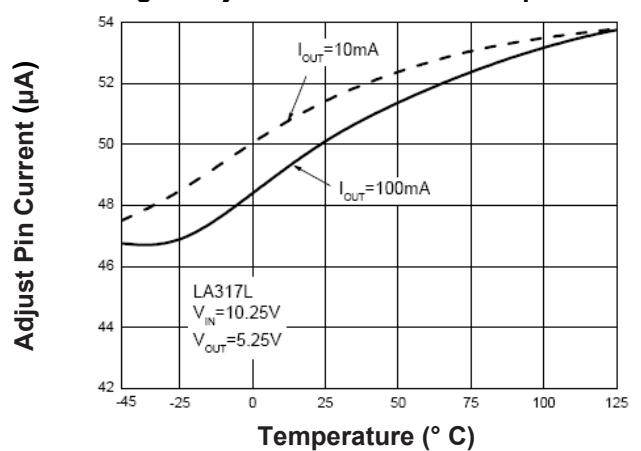


Fig.4- Adjust Pin Current vs. Temperature



# 100mA Adjustable Positive Voltage Regulator

## LA317L

### Typical Characteristics Curves (Continued)

Fig.5- Dropout Voltage vs. Temperature

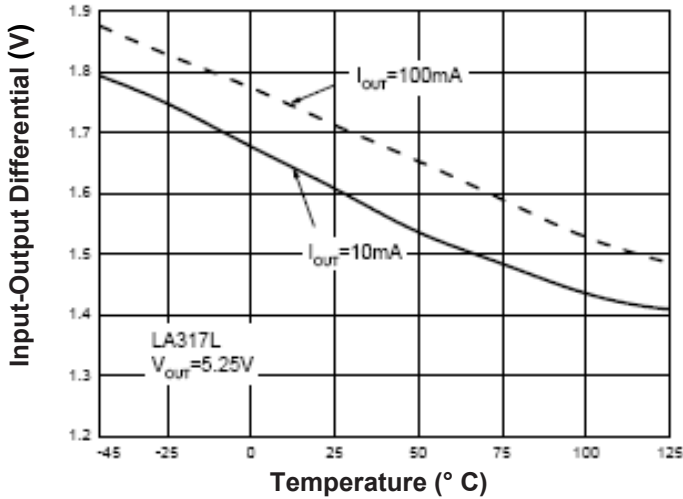


Fig.6- Minimum Operating Current

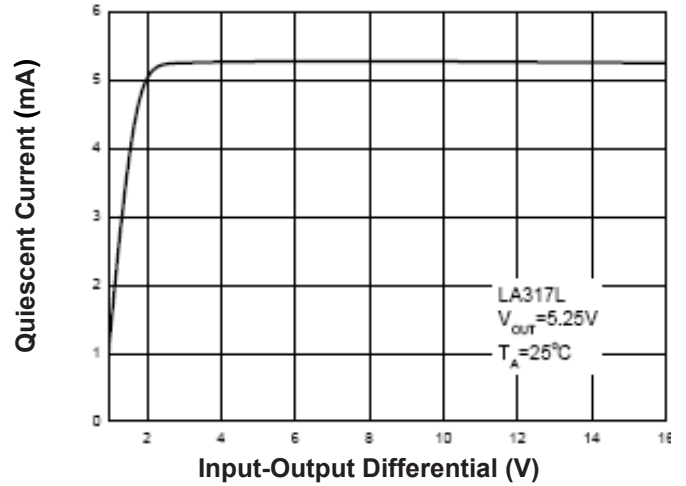


Fig.7- Ripple Rejection vs. Output Voltage

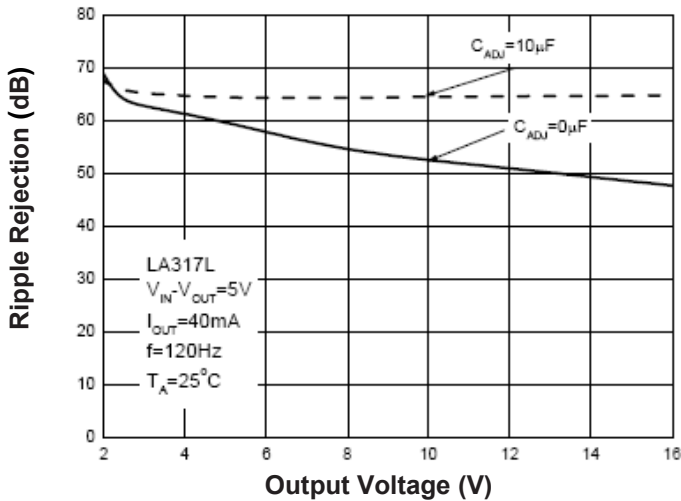
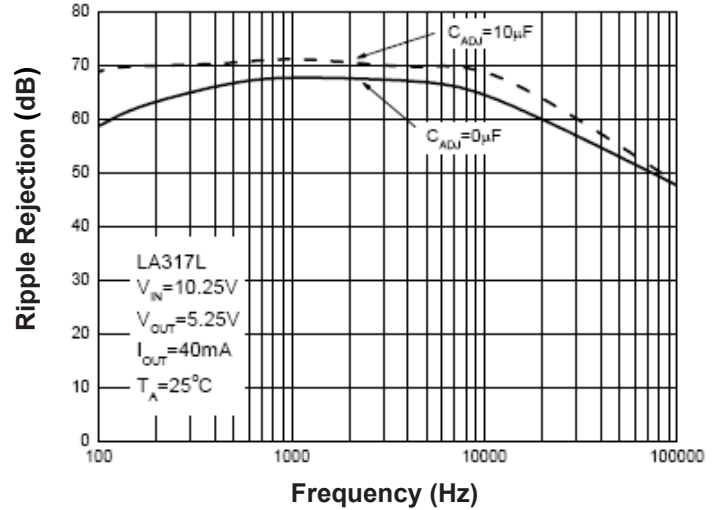


Fig.8- Ripple Rejection vs. Frequency

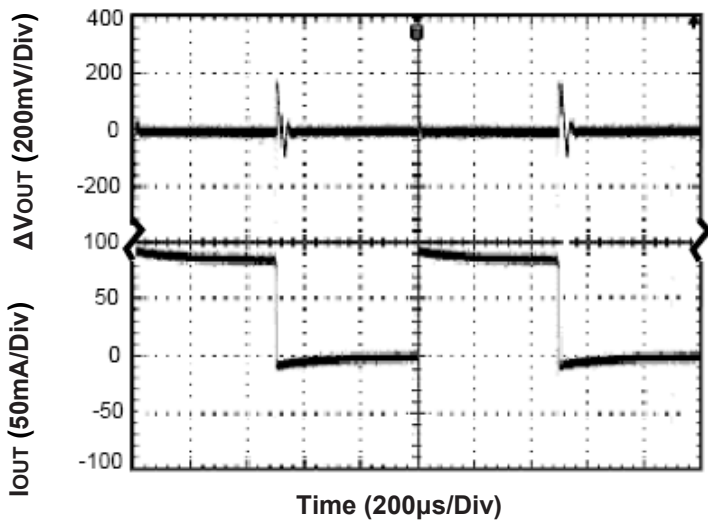


# 100mA Adjustable Positive Voltage Regulator

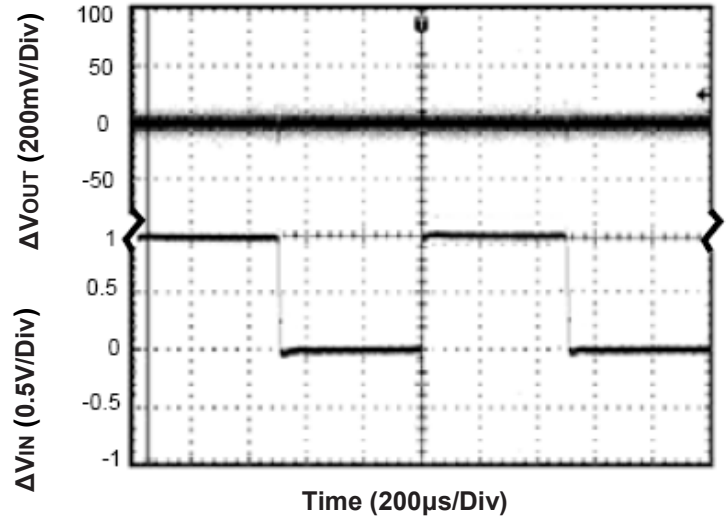
## LA317L

### Typical Characteristics Curves (Continued)

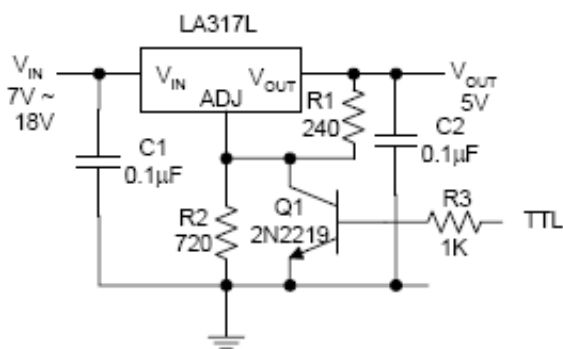
**Fig.9- Load Transient Response**  
(Conditions:  $V_{IN}=10.25V$ ,  $V_{OUT}=5.25V$ ,  $C_{IN}=0.1\mu F$ ,  $C_{OUT}=1\mu F$ ,  $T_A=25^\circ C$ )



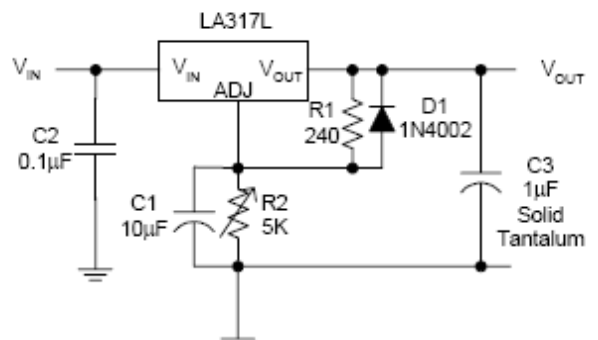
**Fig.10- Line Transient Response**  
(Conditions:  $V_{IN}=10.25$  to  $11.25V$ ,  $I_{OUT}=40mA$ ,  $V_{OUT}=5.25V$ ,  $C_{IN}=0.1\mu F$ ,  $C_{OUT}=1\mu F$ ,  $T_A=25^\circ C$ )



### Typical Application



**Fig.11- 5V Logic Regulator with Electronic Shutdown (Minimum output=1.2V)**



**Fig.12- Adjustable Regulator with Improved Ripple Rejection**  
Note: Discharge C1 if output is shorted to ground

# 100mA Adjustable Positive Voltage Regulator

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### Typical Application (Continued)

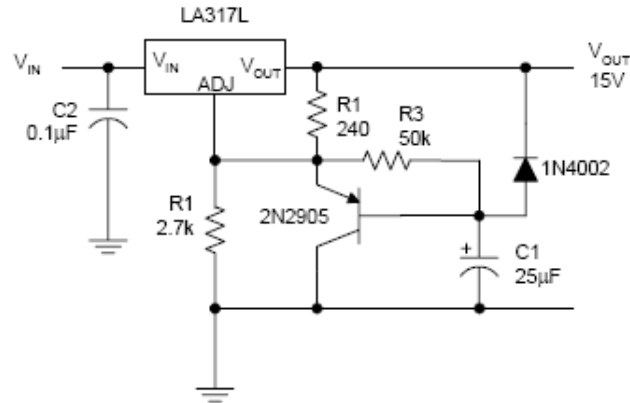
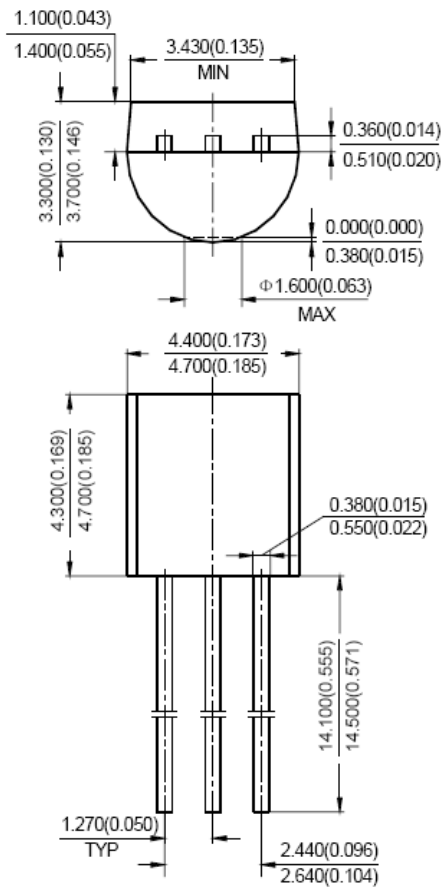


Fig.13- Slow Turn-on 15V Regulator

### Dimensions in mm (inches)



TO-92

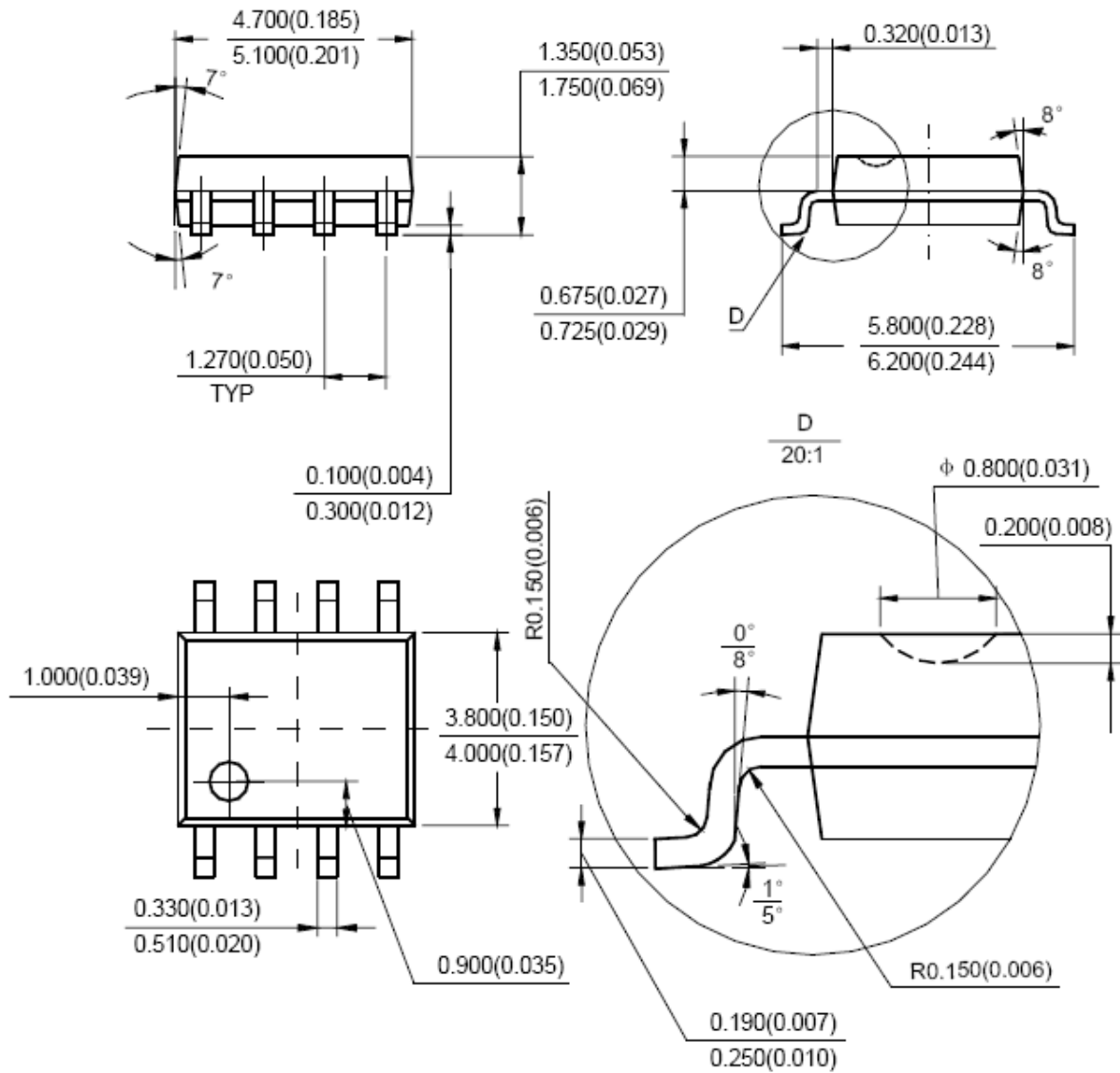


Rev. A/DX 2007-06-04

# 100mA Adjustable Positive Voltage Regulator

## LA317L

### Dimensions in mm (inches) (Continued)



SOP-8



# 100mA Adjustable Positive Voltage Regulator

LA317L

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