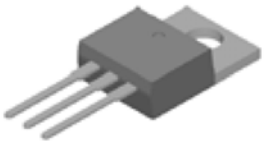
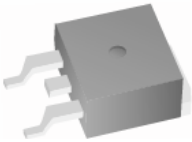
1.0A Adustable Positive Voltage Regulator

SOT-223

D-PACK (TO-252)



TO-220



D2-PACK (TO-263)

General Description

- The LA317 is an adjustable 3-terminal positive voltage regulator with a very low dropout of 1.2V at 1A output current. Using 2 external resistors, the LA317 can provide an adjustable output voltage down to 1.25V.
- The LA317 is available in standard SOT-223, D-PACK, TO-220 and D2-PACK packages.

RoHS Compliant

Features

- Typical 1% output voltage tolerance
- Typical 0.01%/V line reglation
- Typical 0.2% Load Regulation
- Very low dropout voltage: 1.2V at 1A output current
- Trimmed current limit
- On-chip thermal protection
- RoHS Compliance

Applications

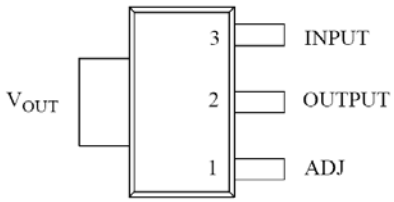
- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD Player
- Network Interface Card/Switch
- Telecom Equipment
- Printer and other Peripheral Equipment

Ordering Information

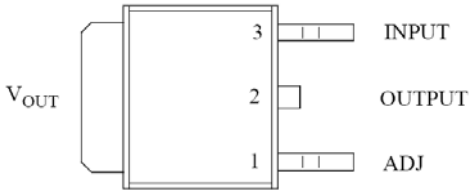
LA317□□—XX—□□□□

- Circuit Type
- Outline:
  - H: SOT-223
  - D: D-PACK (TO-252)
  - T: TO-220
- Factory Location Code
- Package:
  - TR70: 7" Reel
  - TR30: 13" Reel
  - TU: Tube
  - BL: Bulk
  - AR: Tape and Ammo Pack

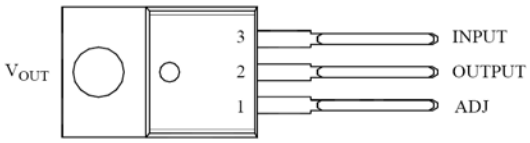
Pin Configuration



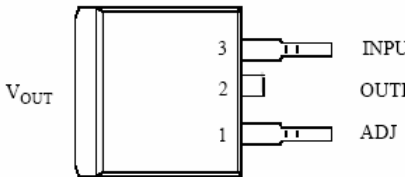
Outline: H
SOT-223



Outline: D
D-PACK (TO-252)

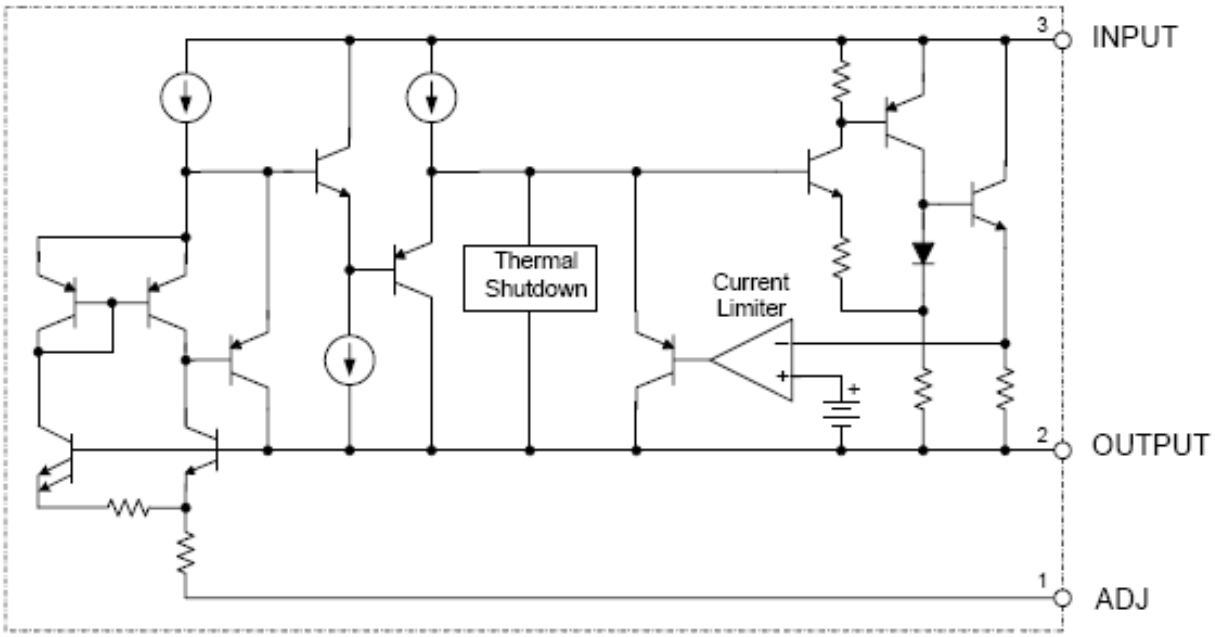


Outline: T
TO-220



Outline: MC
D2-PACK (TO-263)

Block Diagram



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

Symbol	Description	Ratings	Unit
V_{IN}-V_{OUT}	Input - Output Voltage Differential	15	V
Io	Max. Output Current	1	A
T_J	Operating Junction Temperature	150	° C
T_{OPR}	Operating Temperature Range	0 ~ 125	° C
T_{STG}	Storage Temperature Range	-65 ~ 150	° C
T_{LEAD}	Lead Temperature (Soldering, 10sec.)	300	° C
ESD	ESD, Human Body Model (Max.)	4000	V

Electrical Characteristics

(Typicals and limits apply for T_J=25ºC, P≤ Maximum Power Dissipation unless otherwise specified)(Note)

Symbol	Description	LA317			Unit	Conditions
		Min.	Typ.	Max.		
V_{REF}	Reference Input Voltage	1.20	1.25	1.30	V	10mA≤I_{OUT}≤1A 3V ≤V_{IN}-V_{OUT}≤10V,
$\Delta V_{OUT}/V_{OUT}$	Line Regulation	-	0.01	0.04	%/V	I_{OUT}≤20mA, 3V≤V_{IN}-V_{OUT}≤10V,
ΔV_{OUT}	Load Regulation	-	0.2	0.4	%	V_{IN}-V_{OUT}=2V, 10mA≤I_{OUT}≤1A
	Thermal Regulation		0.04	0.07	%/W	20ms Pulse
ΔV	Dropout Voltage	-	1.2	1.3	V	I_{OUT}=1A
I_{LIMIT}	Current Limit	1.2	1.5	1.8	A	V_{IN}-V_{OUT}=2V
I_{ADJ}	Adjustable Pin Current	-	50	100	µA	-
ΔI_{ADJ}	Adjustable Pin Current Change	-	0.2	5	µA	1.4V≤V_{IN}-V_{OUT}≤10V, 10mA≤I_{OUT}≤1A
$I_{L(MIN)}$	Minimum Load Current	-	3.5	10	mA	3V≤V_{IN}-V_{OUT}≤15V
PSRR	Ripple Rejection	60	75	-	dB	f=120Hz, C_{OUT}=1µF Tantalum, V_{IN}-V_{OUT}=3V, I_{OUT}=1A
-	Temperature Stability	-	1	-	%	-
-	Long Term Stability	-	0.3	-	%	T_J=125° C, 1000 Hours
-	RMS Output Noise (% of V_{OUT})	-	0.003	-	%	T_J=25° C, 10Hz≤f≤10KHz

LA317

Symbol	Description	LA317			Unit	Conditions
		Min.	Typ.	Max.		
-	Thermal Resistance Junction to Case	-	15	-	°C/W	SOT-223
		-	10	-		TO-252
		-	4.5	-		TO-220
		-	4	-		TO-263
-	Thermal Shutdown	-	150	-	° C	Junction Temperature
-	Thermal Shutdown Hysteresis				° C	-

Note: Maximum Power Dissipation is Package Type and Case Temperature dependent. Pls see Fig.8.

Typical Characteristics Curves

Fig.1- Dropout Voltage vs. Output Current

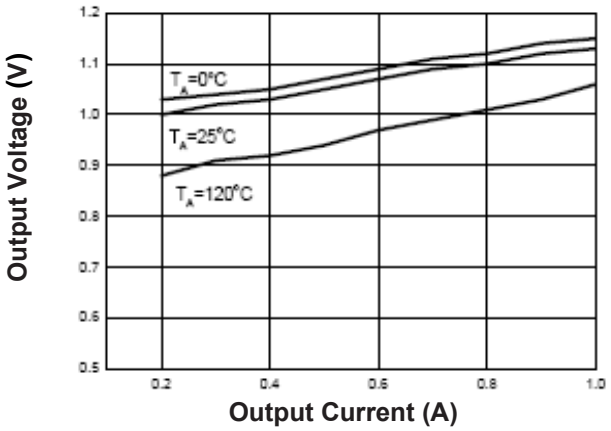


Fig.2- Load Regulation vs. Temperature

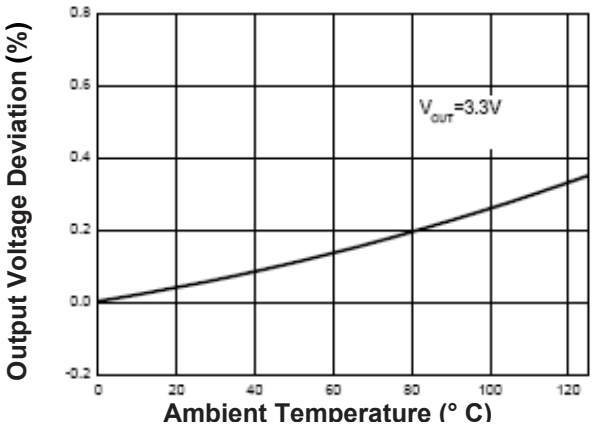


Fig.3- Reference Voltage vs. Temperature

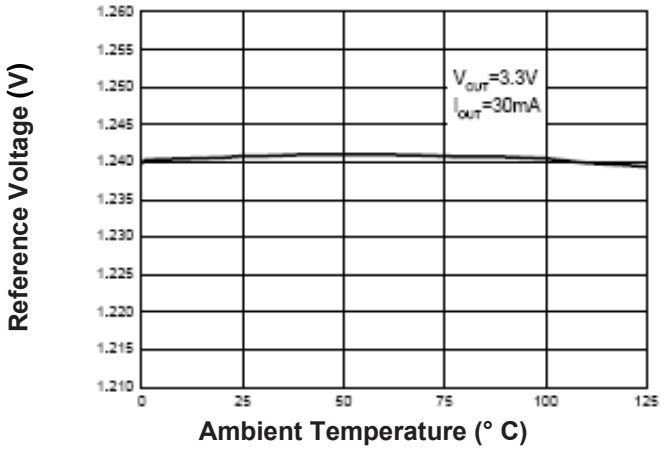
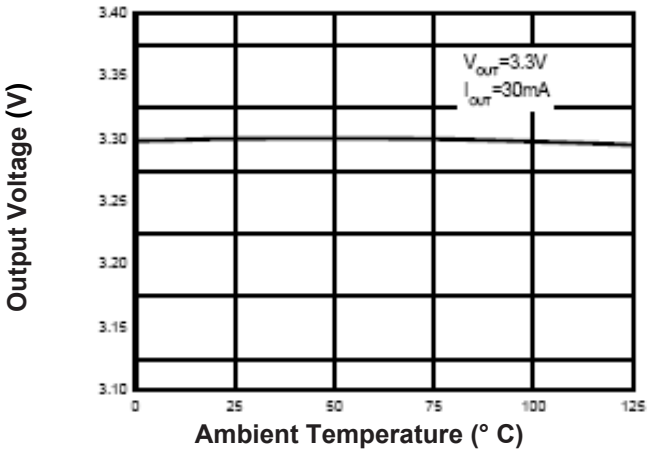


Fig.4- Output Voltage vs. Temperature



Typical Characteristics Curves *(Continued)*

Fig.5- Minimum Load Current vs. Temperature

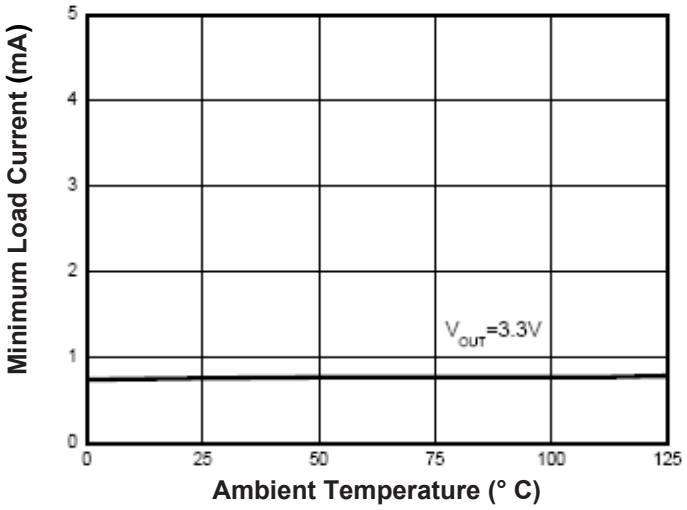


Fig.6- Adjust Pin Current vs. Temperature

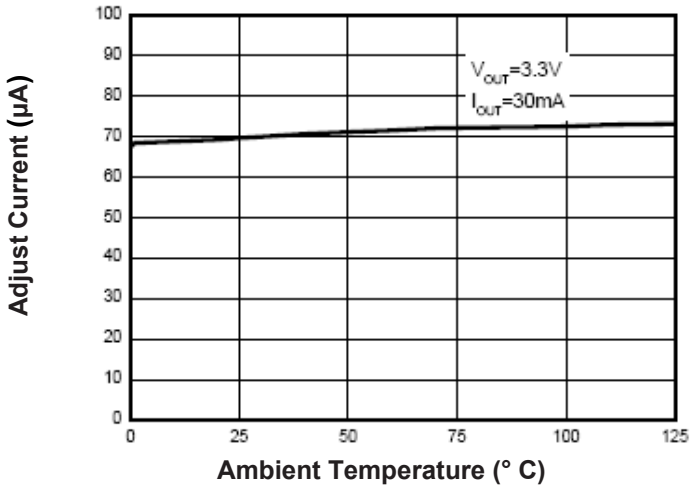


Fig.7- Short-Circuit Current vs. Temperature

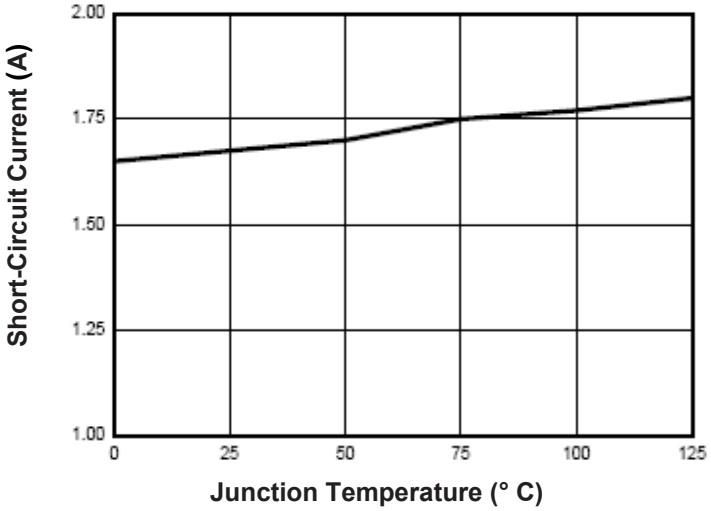
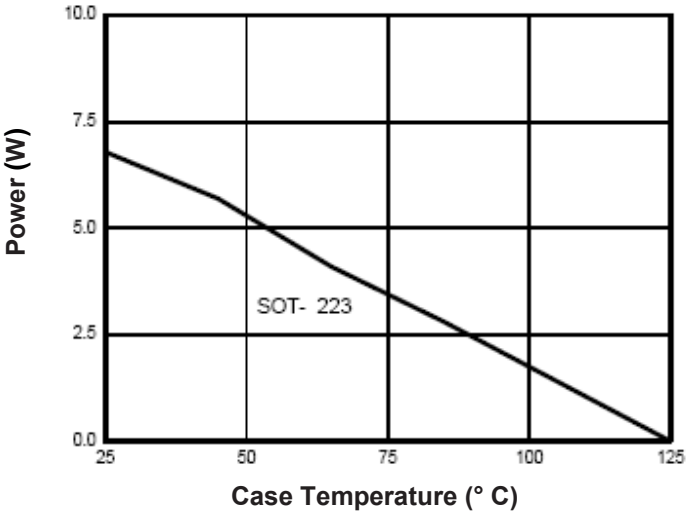


Fig.8- Maximum Power Dissipation



Typical Characteristics Curves *(Continued)*

Fig.9- Ripple Rejection vs. Frequency

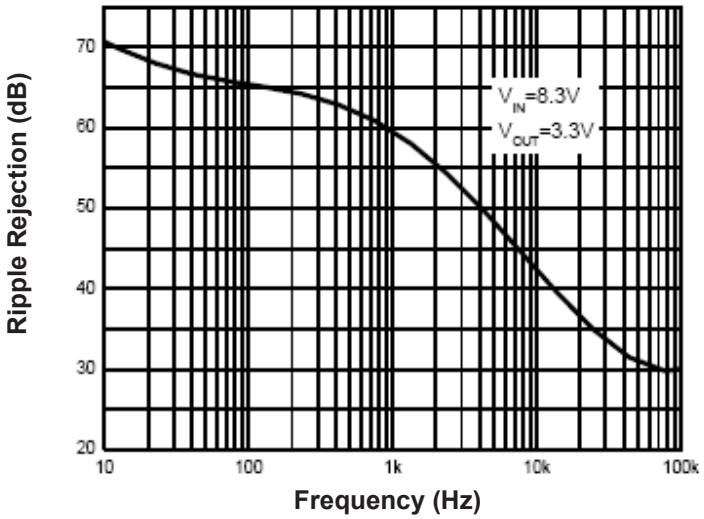


Fig.10- Line Transient Response

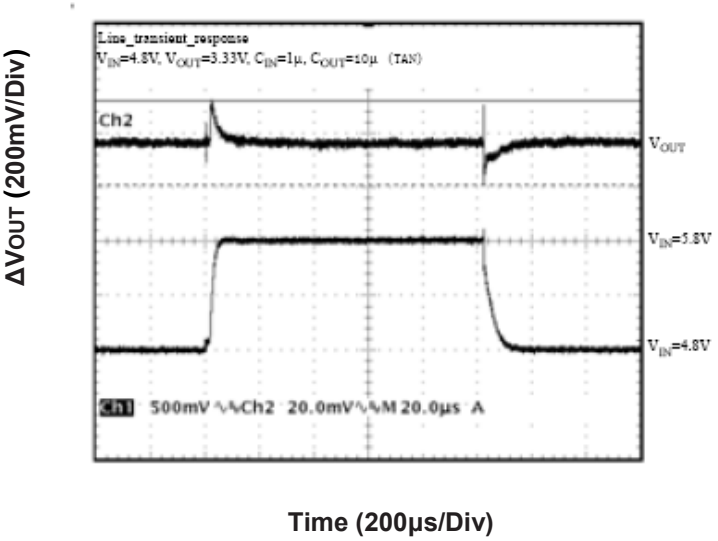
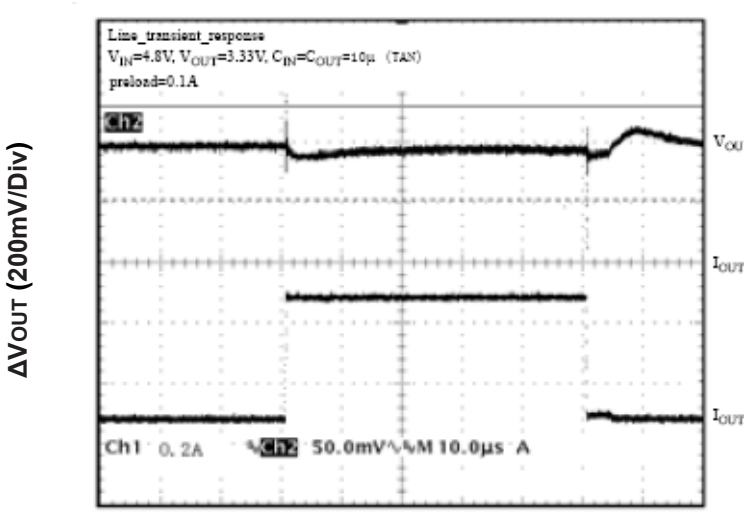
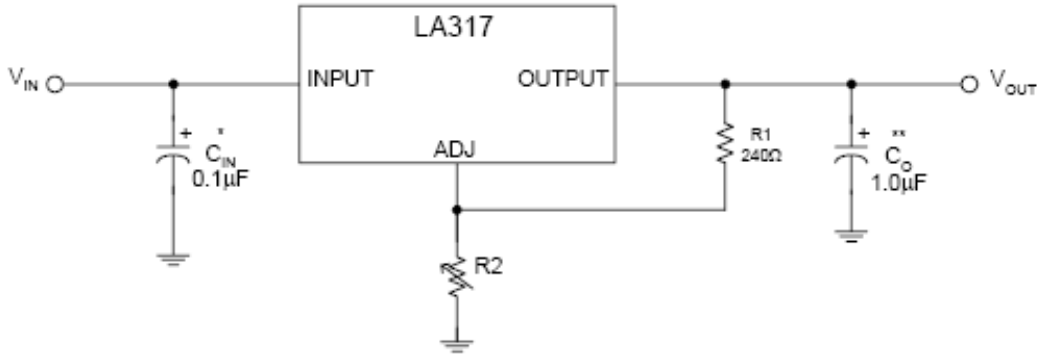


Fig.11- Load Transient Response



Typical Application



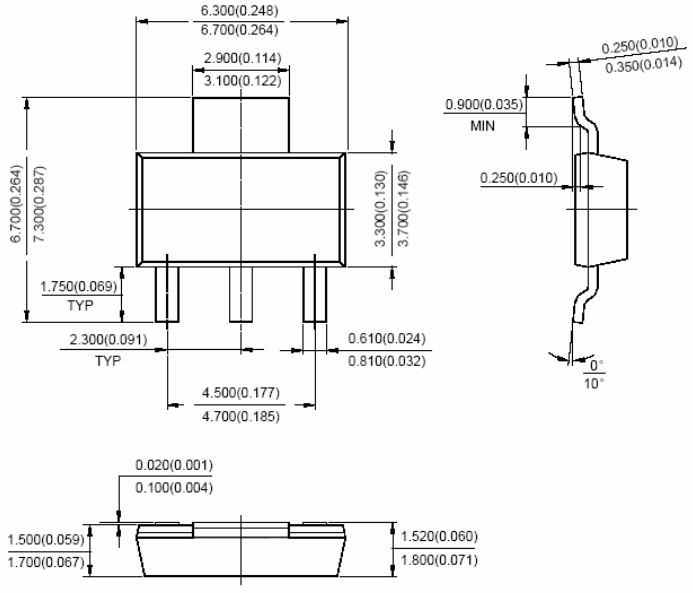
* = C_{IN} is required if the regulator is located near power supply filter.

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

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

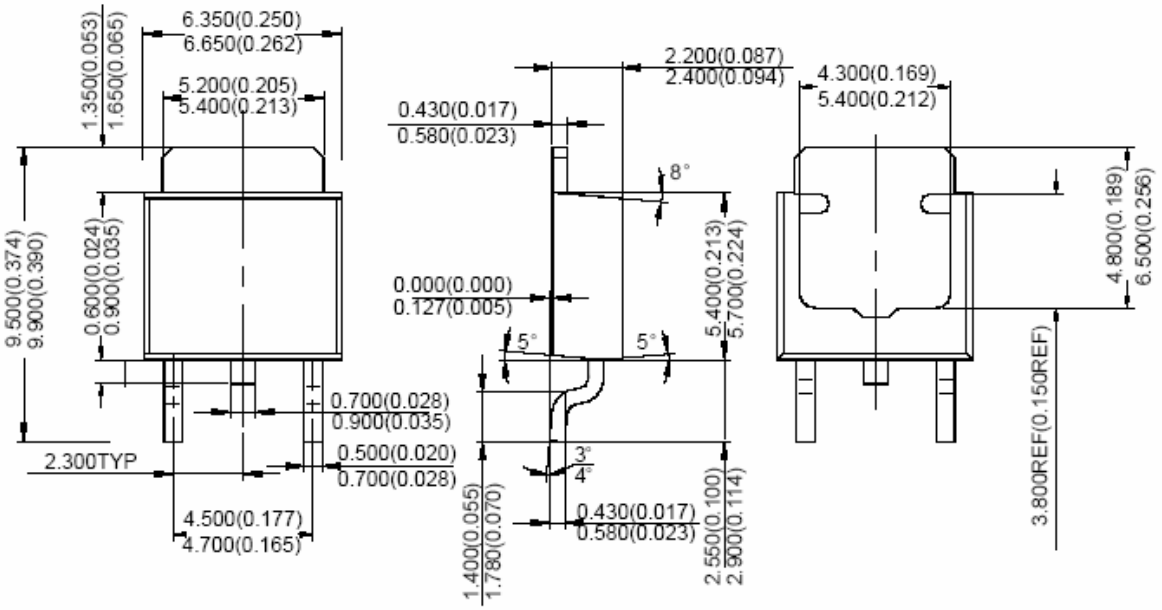
Since I_{ADJ} is controlled to less than 100µA, the error associated with this term is negligible in most applications.

Dimensions in inches (mm)

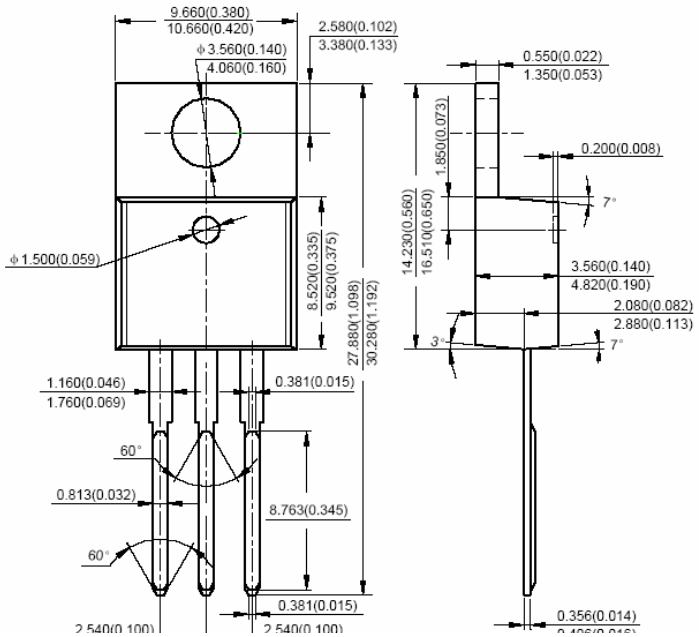


SOT-223

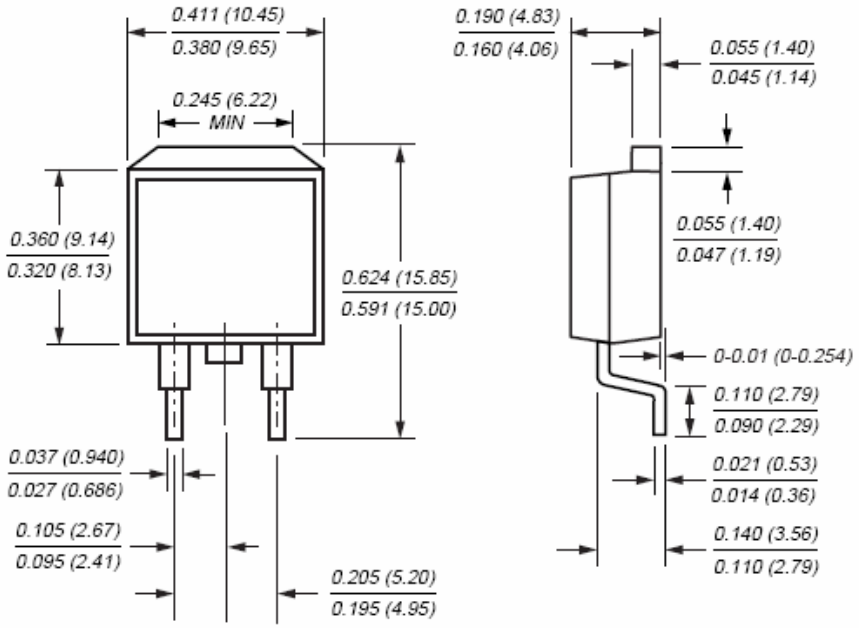
Dimensions in inches (mm) (Continued)



D-PACK
(TO-252)



TO-220



D2-PACK
(TO-263)

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