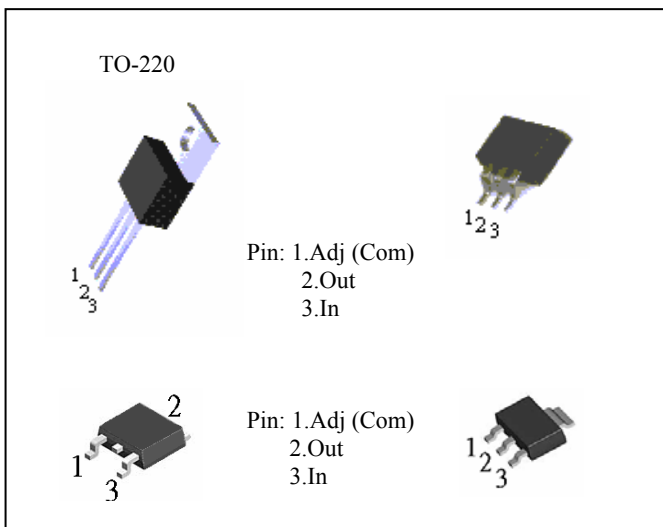


# 1 Amp Low Dropout Positive Voltage Regulator

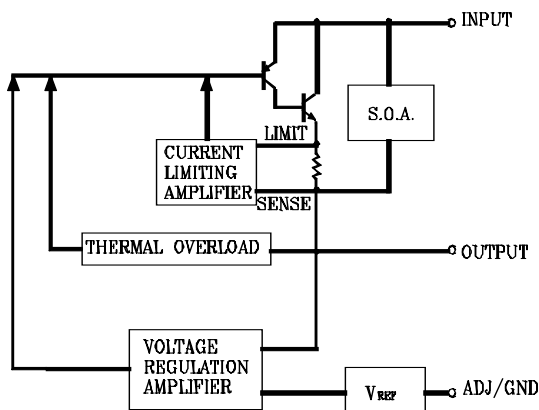
The PJ1117 Series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current. Additionally, the PJ1117 Series provides excellent regulation over variations due to changes in line, load and temperature. Outstanding features include low dropout performance at rated current, fast transient response. The PJ1117 Series are three terminal regulators with fixed and adjustable voltage options available in popular packages.



## FEATURES

- Low dropout voltage 1.3 V max.
- Full current rating over line and temperature
- Fast transient response
- $\pm 2\%$  Total output regulation over line, load and temperature
- Adjust pin current max 120  $\mu$  A over temperature
- Line regulation typical 0.015%.
- Load regulation typical 0.05%.
- Fixed/adjustable output voltage
- TO-220, TO-263, TO-252& SOT-223 package

## BLOCK DIAGRAM



## ORDERING INFORMATION

Device	Operating Temperature (Ambient)	Package
PJ1117CZ-adj / 1.8V PJ1117CZ-2.5V / 2.85V PJ1117CZ-3.3V PJ1117CZ-5.0V	-20 to +85°C	TO-220
PJ1117CM -adj / 1.8V PJ1117CM-2.5V / 2.85V PJ1117CM-3.3V PJ1117CM-5.0V		TO-263
PJ1117CW-adj / 1.8V PJ1117CW-2.5V/2.85V PJ1117CW-3.3V PJ1117CW-5.0V		SOT-223
PJ1117CP-adj / 1.8V PJ1117CP-2.5V/2.85V PJ1117CP-3.3V PJ1117CP-5.0V		TO-252

NOTE: Contact factory for additional voltage option.

## ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Maximum	Units
Input Voltage	$V_{IN}$	7	V
Power Dissipation	$P_D$	Internally Limited	W
Thermal Resistance Junction to Case	$\theta_{JC}$	2.5	°C / W
Thermal Resistance Junction to Ambient	$\theta_{JA}$	50	
Operating Junction Temperature Range	$T_J$	0 to +125	°C
Operating Ambient Temperature Range	$T_A$	-20 to +85	
Storage Temperature Range	$T_{STG}$	-25 to 150	
Lead Temperature (Soldering) 10 Sec.	$T_{LEAD}$	260	

# 1 Amp Low Dropout Positive Voltage Regulator

## ELECTRICAL CHARACTERISTICS

Unless otherwise specified, Adjust  $V_{IN} = 2.75V$  to  $12V$  and Adjust  $I_o = 10mA$  to  $1.0A$   
 Fixed  $V_{IN} = 4.75V$  to  $12V$  and Fixed  $I_o = 10mA$  to  $1.0A$   
 (For Fixed 5.0V Output Version,  $V_{IN} = 7.5V$  to  $12V$ )

Parameter	Symbol	Test Conditions			Test Limits			Units	
		$V_{IN} - V_{OUT}$	$I_o$	$T_J^{(4)}$	Min	Typ	Max		
Output Voltage <sup>(1)</sup>	$V_o$	5V	10mA	25	0.99 V <sub>o</sub>	$V_o$	1.01 V <sub>o</sub>	V	
Fixed Voltage				Over Temp.	0.98 V <sub>o</sub>		1.02 V <sub>o</sub>		
Reference Voltage <sup>(1)</sup>	$V_{REF}$	5V	10mA	25	1.238	1.250	1.262		
Adj Voltage				Over Temp.	1.225		1.275		
Line Regulation <sup>(1)</sup> ( $V_{in} - V_{out} = 3V$ )	$REG_{(LINE)}$		10mA	25			0.015	0.2	
				Over Temp.			0.035		
Load Regulation <sup>(1)</sup> ( $V_{in} - V_{out} = 3V$ )	$REG_{(LOAD)}$			25			0.05	0.3	
				Over Temp.			0.2		0.4
Dropout Voltage $\Delta V_{REF} = 1\%$	$V_D$			25			1	V	
				Over Temp.			1.1		1.3
Current Limit ( $V_{in} - V_{out} = 5V$ )	$I_{cL}$				1.0		1.1	A	
Quiescent Current Fixed Model	$I_Q$	5V					12	14	mA
Temperature Coefficient	$T_c$						0.005		%/°C
Adjust Pin Current	$I_{ADJ}$			25			55		$\mu A$
								120	
Adjust Pin Current Change	$\Delta I_{ADJ}$						0.2	5	
Temperature Stability	$T_s$	5V	500mA	Over Temp.			0.5		%
Minimum Load Current Adjust Model	$I_o$	5V					5	10	mA
RMS Output Noise <sup>(2)</sup>	$V_N$			25			0.003		%V <sub>o</sub>
Ripple Rejection Ratio <sup>(3)</sup>	$R_A$	5V	1.0A	Over Temp.	60		72		dB

(1)Low duty cycle pulse testing with Kelvin connections required.

(2)Bandwidth of 10Hz to 10KHz.

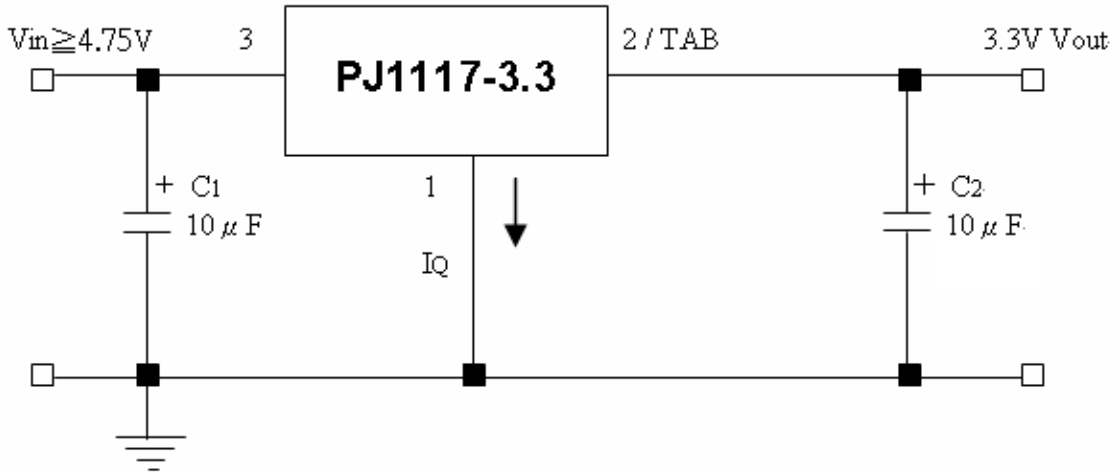
(3)120Hz input ripple ( $C_{ADJ}$  for ADJ)=25  $\mu F$  .

(4)Over Temp.-over specified operating junction temperature range.

1 Amp Low Dropout Positive Voltage Regulator

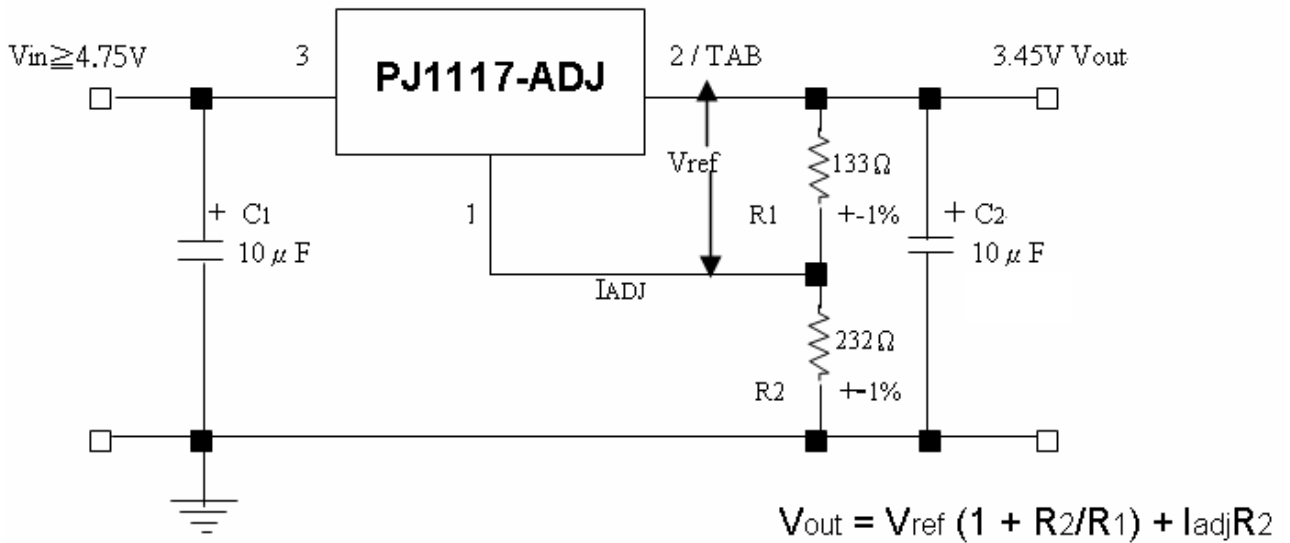
Typical Application Circuit

FIXED VOLTAGE REGULATOR (1)(2)



(1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS

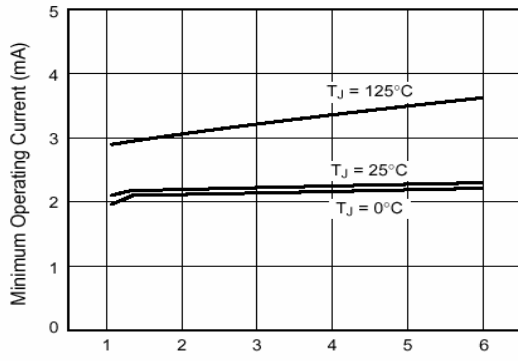
ADJUSTABLE VOLTAGE REGULATOR (1)(2)



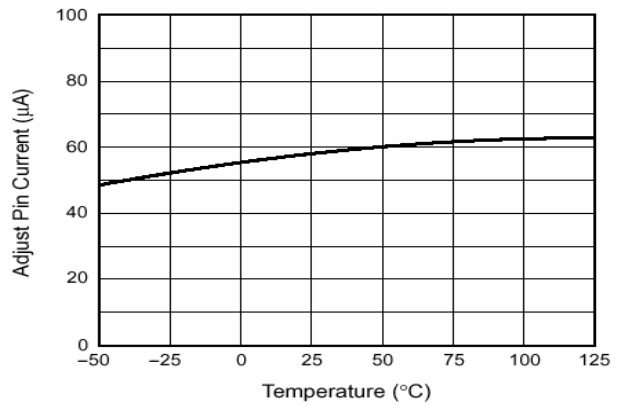
$$V_{out} = V_{ref} (1 + R2/R1) + I_{adj}R2$$

(1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS  
 (2) C2 REQUIRED FOR STABILITY

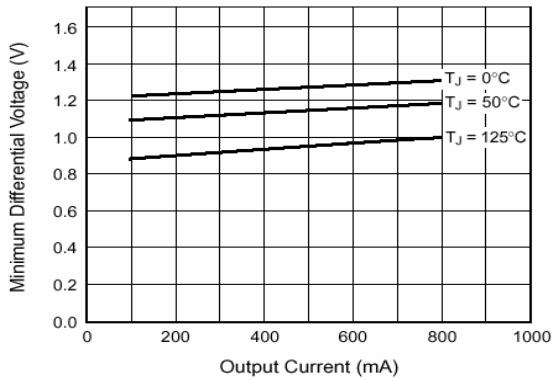
# 1 Amp Low Dropout Positive Voltage Regulator



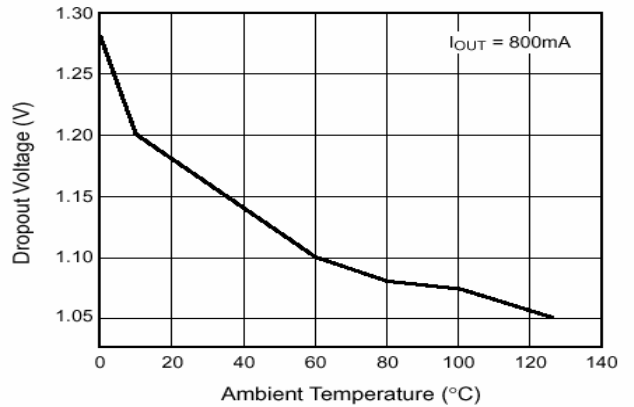
**Fig. 1 – Minimum Load Current (Adjustable Version)**



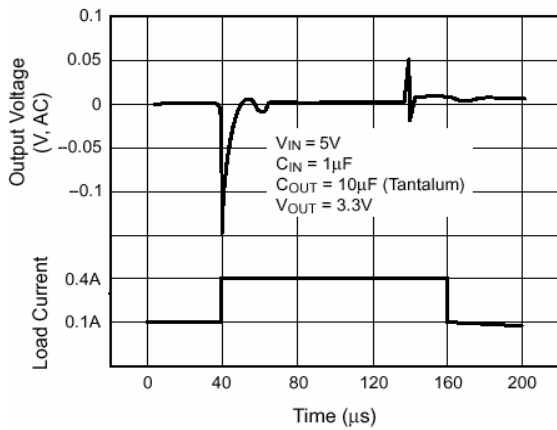
**Fig. 2 – Adjust Pin Current**



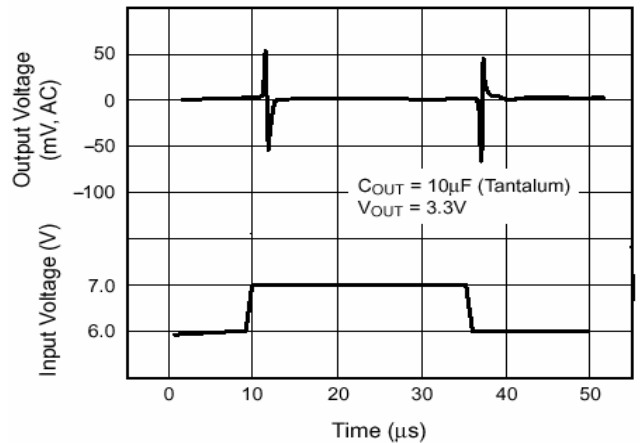
**Fig. 3 – Dropout Voltage**



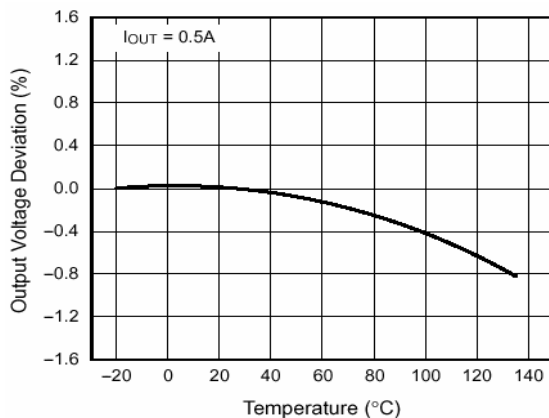
**Fig. 4 – Dropout Voltage v.s. Temperature**



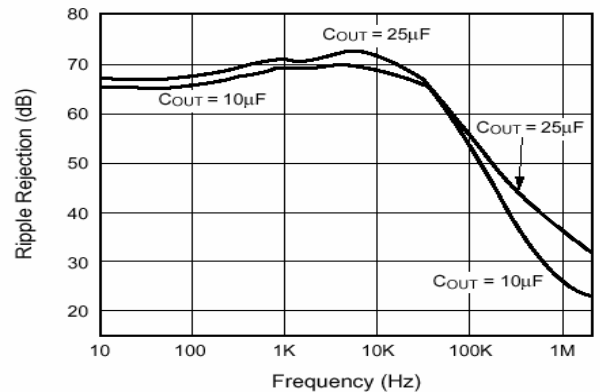
**Fig. 5 – Load Transient Response**



**Fig. 6 – Line Transient Response**



**Fig. 7 – Temperature Stability**

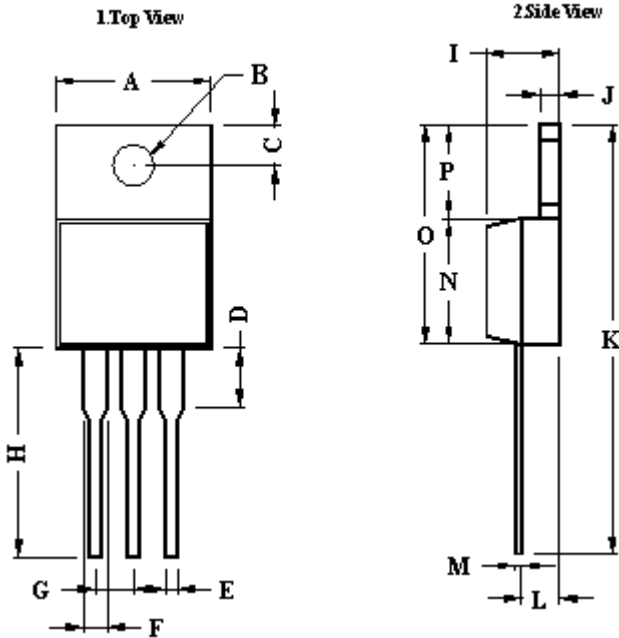


**Fig. 8 – Ripple Rejection (with  $C_{adj} 25\mu\text{F}$ )**

# 1 Amp Low Dropout Positive Voltage Regulator

## TO-220 Mechanical drawing

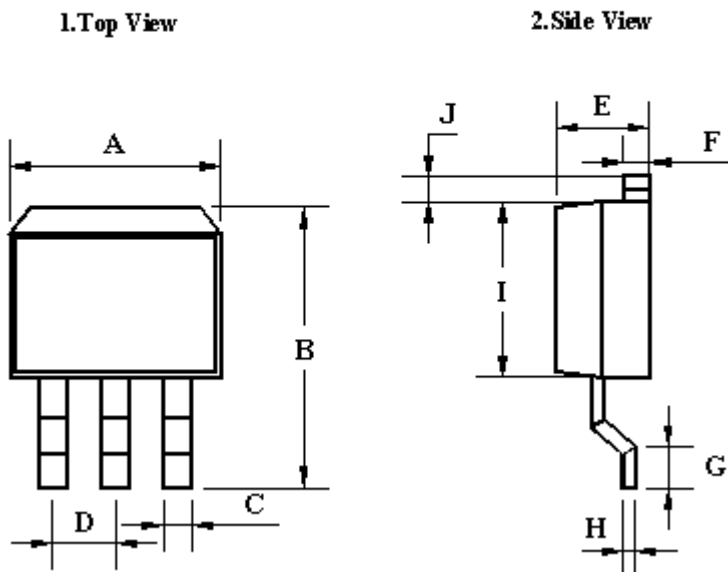
TO-220 Unit:mm



DIM	TO-220 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.00	10.50	0.394	0.413
B	3.24	4.44	0.128	0.175
C	2.44	2.94	0.096	0.116
D	3.565	4.315	0.140	0.170
E	0.68	0.92	0.027	0.036
F	1.115	1.485	0.044	0.058
G	2.345	2.715	0.092	0.107
H	13.49	14.31	0.531	0.563
I	4.475	5.225	0.176	0.206
J	1.15	1.39	0.045	0.055
K	27.78	29.62	1.094	1.166
L	2.175	2.925	0.086	0.115
M	0.297	0.477	0.012	0.019
N	8.28	8.80	0.326	0.346
O	14.29	15.31	0.563	0.603
P	6.01	6.51	0.237	0.256

## TO-263 Mechanical drawing

TO-263 Unit:mm



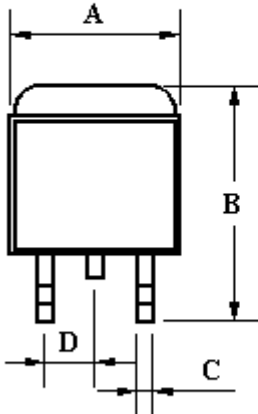
DIM	TO-263 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.00	10.50	0.394	0.413
B	14.60	15.87	0.575	0.625
C	0.68	0.92	0.027	0.036
D	2.42	2.66	0.095	0.105
E	4.31	4.83	0.170	0.190
F	1.14	1.40	0.045	0.055
G	2.28	2.79	0.090	0.110
H	0.45	0.73	0.018	0.029
I	8.28	8.80	0.326	0.346
J	1.14	1.4	0.045	0.055

# 1 Amp Low Dropout Positive Voltage Regulator

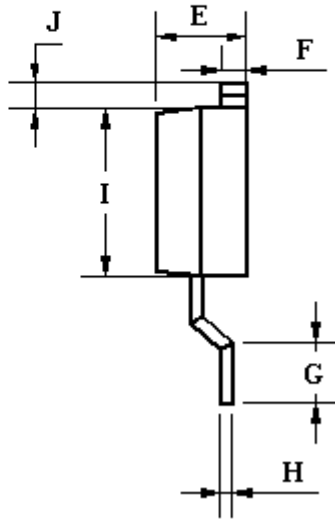
## TO-252 Mechanical drawing

TO-252 Unit:mm

1.Top View



2.Side View

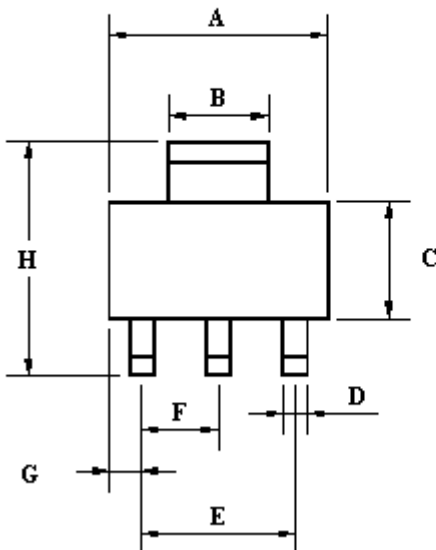


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.57	6.84	0.259	0.269
B	9.25	10.40	0.364	0.409
C	0.62	0.76	0.024	0.030
D	2.56	2.67	0.101	0.105
E	2.30	2.39	0.090	0.094
F	0.49	0.57	0.019	0.022
G	1.46	1.58	0.057	0.062
H	0.52	0.57	0.020	0.022
I	5.34	5.55	0.210	0.219
J	1.46	1.64	0.057	0.065

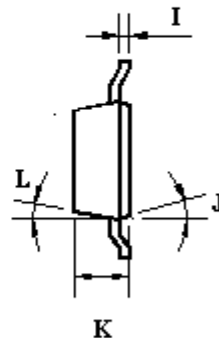
## SOT-223 Mechanical drawing

SOT-223 Unit:mm

1.Top View



2.Side View



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.30	6.80	0.248	0.268
B	2.9	3.1	0.114	0.122
C	3.3	3.7	0.130	0.146
D	0.63	0.83	0.025	0.033
E	4.60	4.60	0.181	0.181
F	2.30	2.30	0.091	0.091
G	0.835	1.035	0.033	0.041
H	6.7	7.3	0.264	0.287
I	0.255	0.355	0.010	0.014
J	16°	16°	16°	16°
K	1.55	1.80	0.061	0.070
L	10°	10°	10°	10°

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