

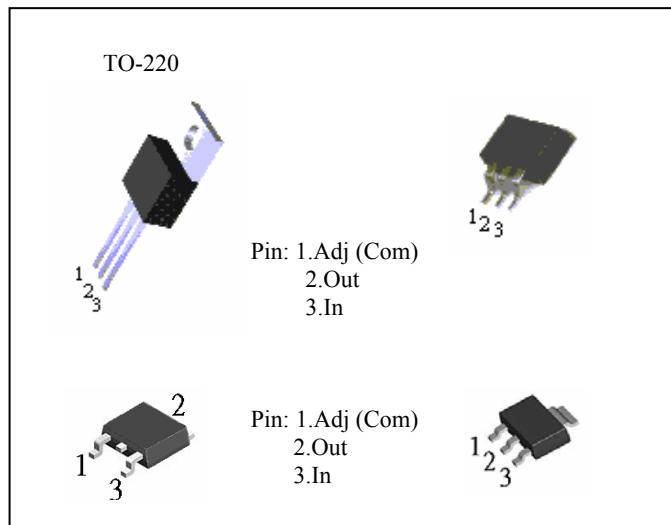
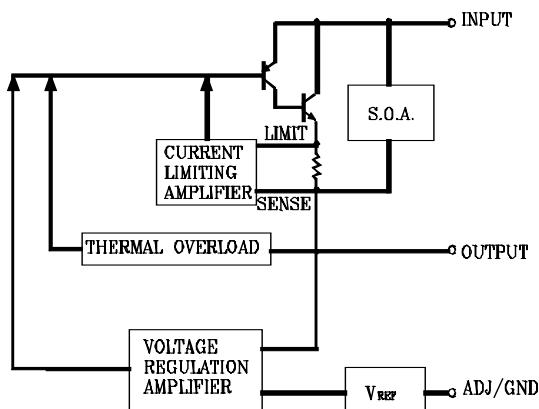
# 1 Amp Low Dropout Positive Voltage Regulator

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	-20 to +85°C	TO-263
PJ1117CW-adj / 1.8V PJ1117CW-2.5V/2.85V PJ1117CW-3.3V PJ1117CW-5.0V	-20 to +85°C	SOT-223
PJ1117CP-adj / 1.8V PJ1117CP-2.5V/2.85V PJ1117CP-3.3V PJ1117CP-5.0V	-20 to +85°C	TO-252

NOTE: Contact factory for additional voltage option.

## ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Maximum	Units
Input Voltage	V <sub>IN</sub>	7	V
Power Dissipation	P <sub>D</sub>	Internally Limited	W
Thermal Resistance Junction to Case	$\theta_{JC}$	2.5	$^{\circ}\text{C} / \text{W}$
Thermal Resistance Junction to Ambient	$\theta_{JA}$	50	
Operating Junction Temperature Range	T <sub>J</sub>	0 to +125	$^{\circ}\text{C}$
Operating Ambient Temperature Range	T <sub>A</sub>	-20 to +85	
Storage Temperature Range	T <sub>STG</sub>	-25 to 150	
Lead Temperature (Soldering) 10 Sec.	T <sub>LEAD</sub>	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)

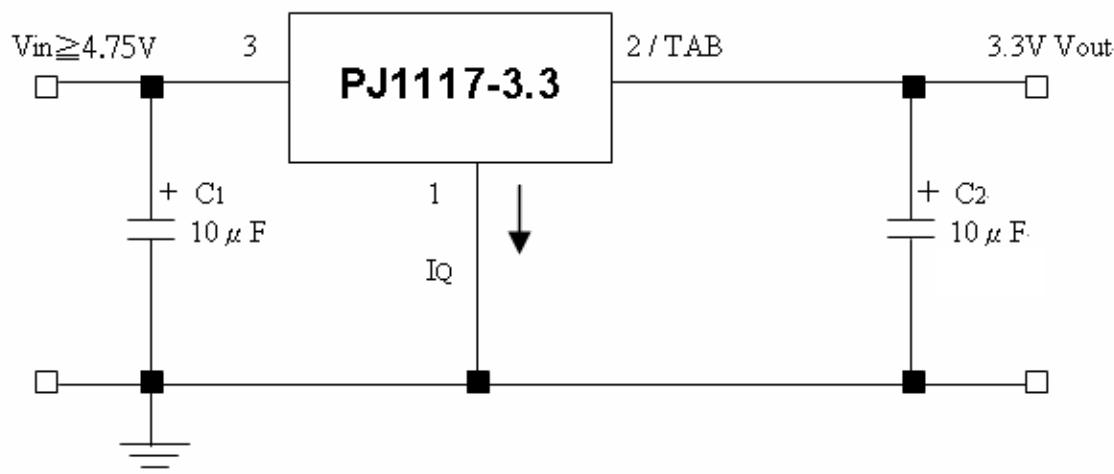
Parameter	Symbol	Test Conditions			Test Limits			Units
		$V_{IN} - V_{OUT}$	$I_o$	$T_J^{(4)}$	Min	Typ	Max	
Output Voltage <sup>(1)</sup>	$V_o$	5V	10mA	25	0.99 Vol	$V_o$	1.01 Vol	V
Fixed Voltage				Over Temp.	0.98 Vol		1.02 Vol	
Reference Voltage <sup>(1)</sup>	$V_{REF}$	5V	10mA	25	1.238	1.250	1.262	V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

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

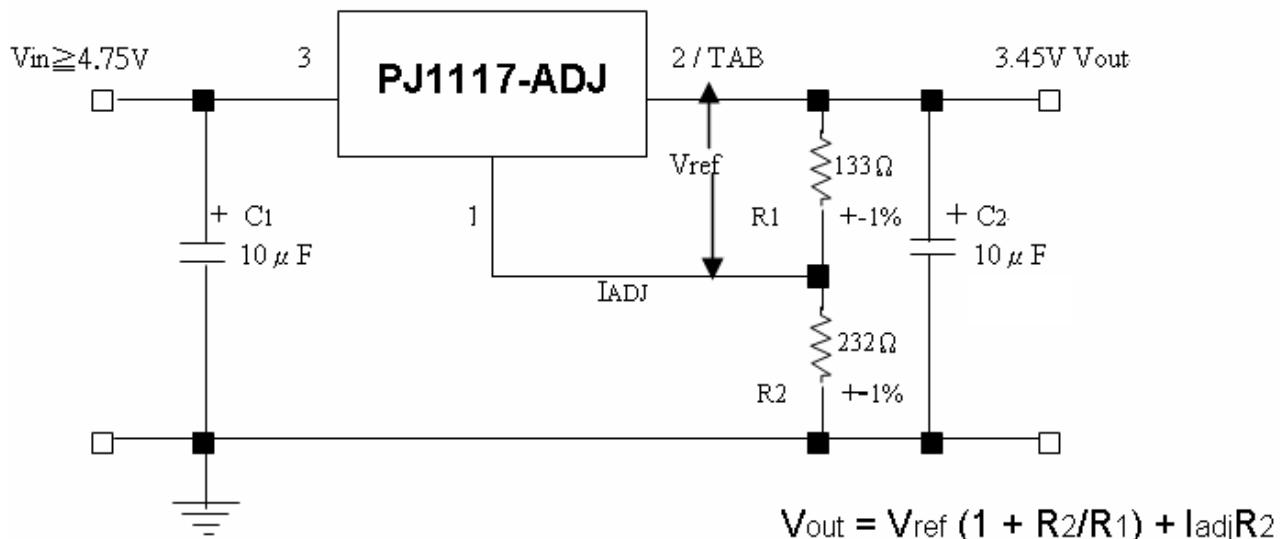
(2)Bandwidth of 10Hz to 10KHz.

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

# 1 Amp Low Dropout Positive Voltage Regulator

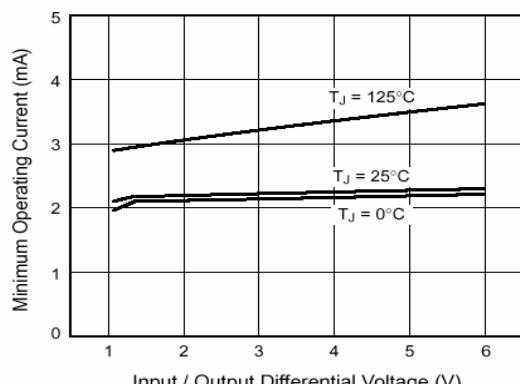


Fig. 1 – Minimum Load Current  
(Adjustable Version)

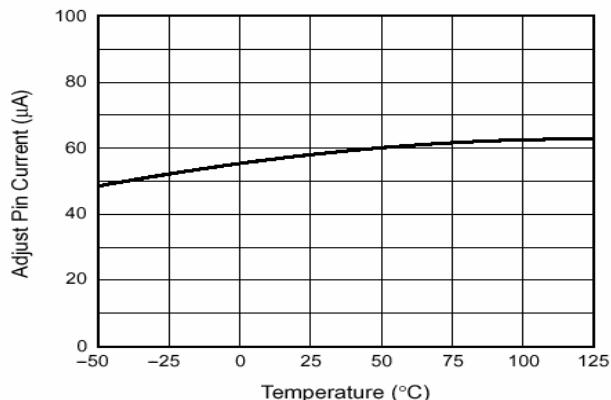


Fig. 2 – Adjust Pin Current

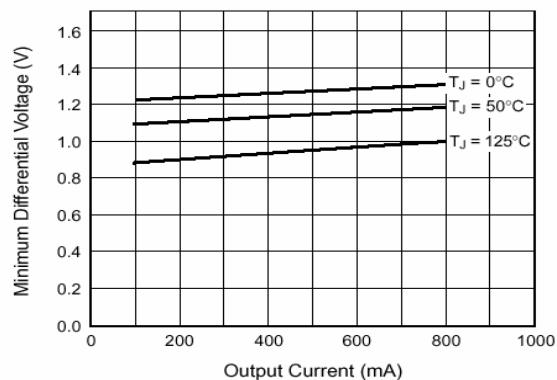


Fig. 3 – Dropout Voltage

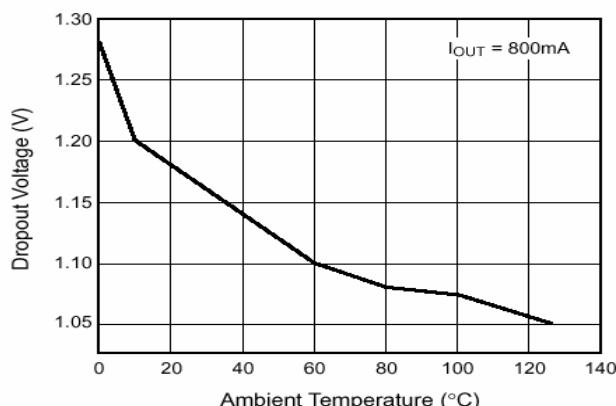


Fig. 4 – Dropout Voltage v.s.  
Temperature

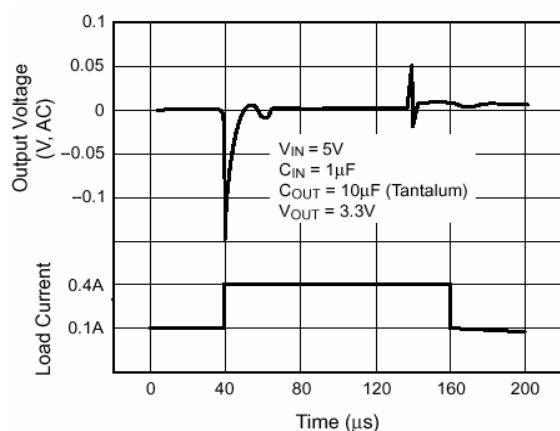


Fig. 5 – Load Transient Response

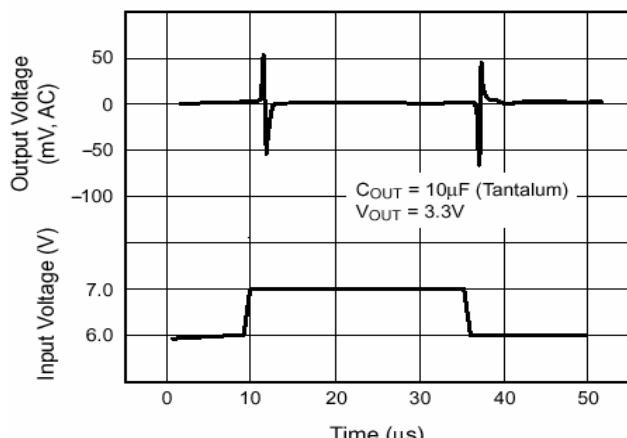


Fig. 6 – Line Transient Response

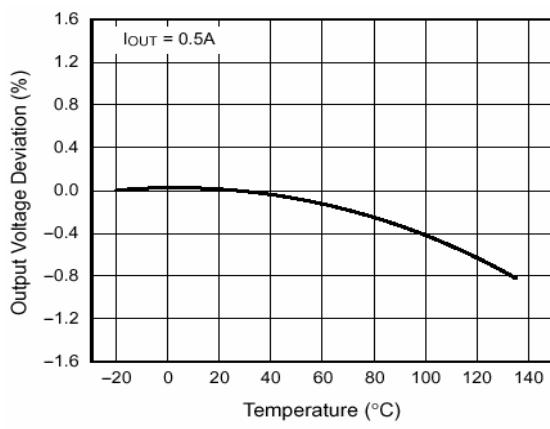


Fig. 7 – Temperature Stability

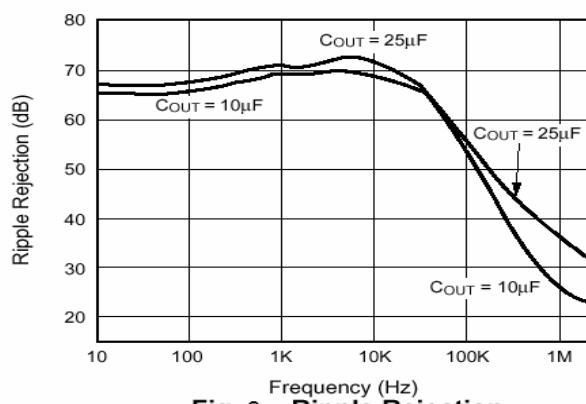
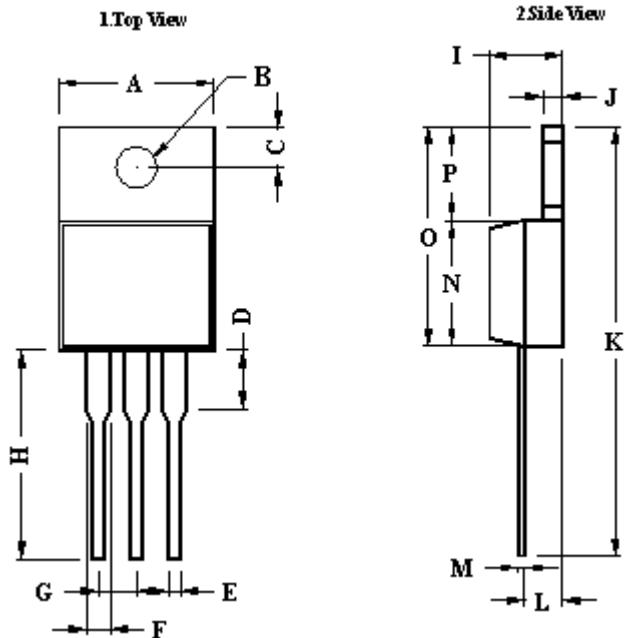


Fig. 8 – Ripple Rejection  
(with  $C_{\text{adj}} = 25\mu\text{F}$ )

## 1 Amp Low Dropout Positive Voltage Regulator

TO-220 Mechanical drawing

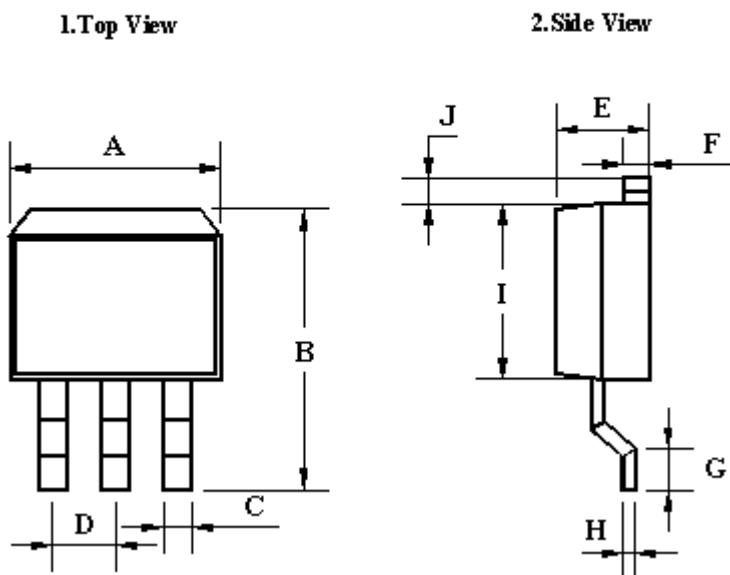
TO-220 Unit:mm



DIM	TO-220 DIMENSION			
	MILLIMETERS	INCHES	MIN	MAX
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



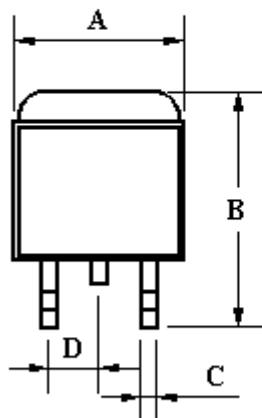
DIM	TO-263 DIMENSION			
	MILLIMETERS	INCHES	MIN	MAX
A	10.00	10.50	0.394	0.413
B	14.60	15.87	0.575	0.625
C	0.68	0.92	0.027	0.036
D	2.42	2.66	0.095	0.105
E	4.31	4.83	0.170	0.190
F	1.14	1.40	0.045	0.055
G	2.28	2.79	0.090	0.110
H	0.45	0.73	0.018	0.029
I	8.28	8.80	0.326	0.346
J	1.14	1.4	0.045	0.055

## 1 Amp Low Dropout Positive Voltage Regulator

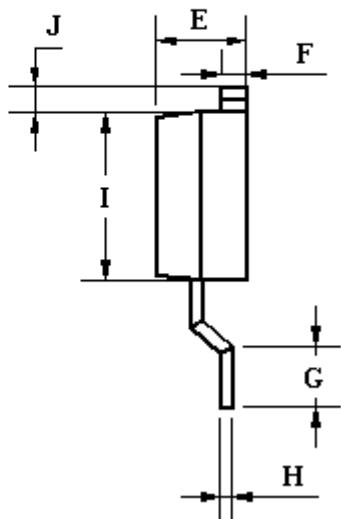
TO-252 Mechanical drawing

TO-252 Unit:mm

1. Top View



2. Side View

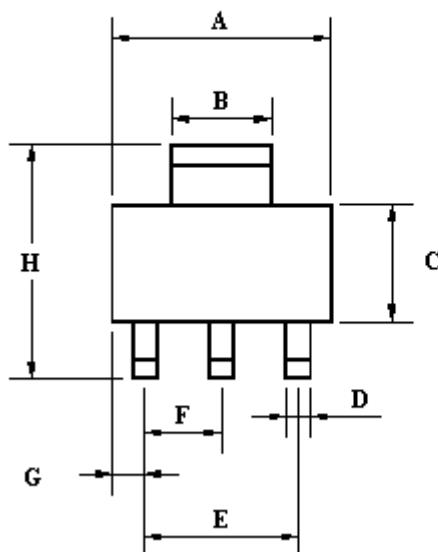


TO-252 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.57	6.84	0.259	0.269
B	9.25	10.40	0.364	0.409
C	0.62	0.76	0.024	0.030
D	2.56	2.67	0.101	0.105
E	2.30	2.39	0.090	0.094
F	0.49	0.57	0.019	0.022
G	1.46	1.58	0.057	0.062
H	0.52	0.57	0.020	0.022
I	5.34	5.55	0.210	0.219
J	1.46	1.64	0.057	0.065

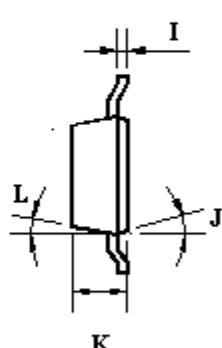
SOT-223 Mechanical drawing

SOT-223 Unit:mm

1. Top View



2. Side View



SOT-223 DIMENSION				
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°