# 5V Positive Voltage Regulator

## Features

- Output Voltage of 5.0V (typ.)
- Output Current up to 150mA (typ.)
- Minimum External Components.
- Output Voltage Tolerances of ±4%
- ESD Rating is 3KV (Per MIL-STD-883D).
- RoHS-compliant TO-92, SO-8, SOT-89, and SOT-223

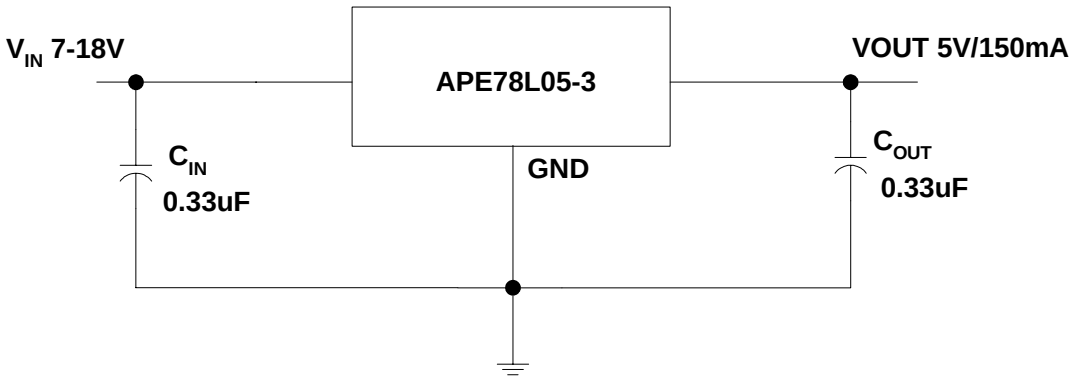
## Typical Applications

- Sound Card on PC Main Board
- DVD-ROM, CD-ROM
- Networking Equipment

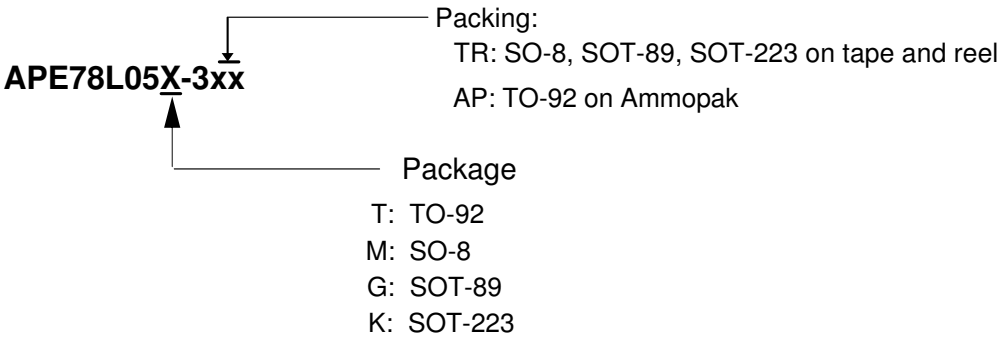
## Description

The APE78L05-3 is a three-terminal positive regulator that can be used as a Zener diode/resistor combination replacement. It offers an effective output impedance improvement of two orders of magnitude, and lower quiescent current. This fixed voltage regulator can provide local or on-card regulation for elimination of noise and distribution problems associated with single point regulation. It is an excellent solution for a stereo power supply on a PC main board.

## Typical Application




## Ordering information




Example: APE78L05T-3AP RoHS-compliant TO-92 on Ammopak

## Absolute Maximum Ratings

Input Voltage ($V_{IN}$) ---------- 18V

Power Dissipation (PD) TO-92 0.75W; SO-8 0.7W
SOT-89 0.37W; SOT-223 0.96W

Storage Temperature Range ($T_{ST}$) ---------- -65 To +150℃

Lead Temperature (Soldering) 10 seconds ($T_{LEAD}$) 260℃

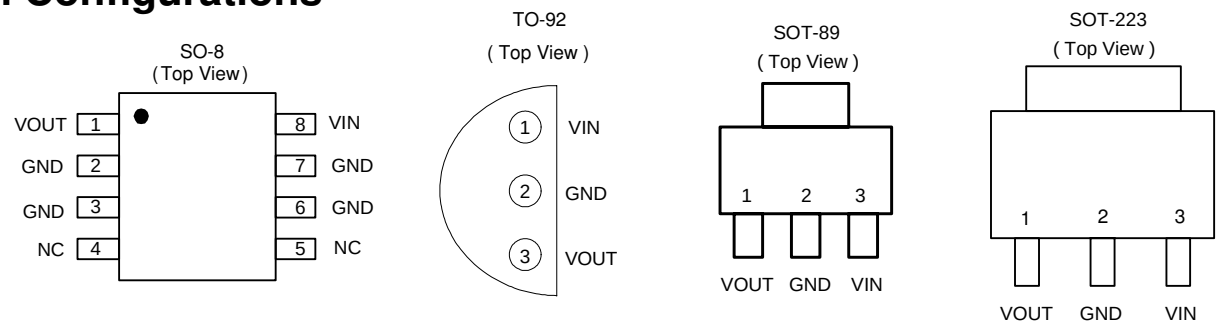
Operating Junction Temperature Range ($T_J$) ------- 0 To 125℃

Thermal Resistance from Junction to Ambient($Rth_{JA}$)

| | | | |
|---|---|---|---|
| TO-92 | 150℃/W; | SO-8 | 160℃/W |
| SOT-89 | 300℃/W | SOT-223 | 117℃/W |

ESD (HBM) Susceptibility ($V_{ESD}$) ---------- 2.7KV

## Pin Configurations

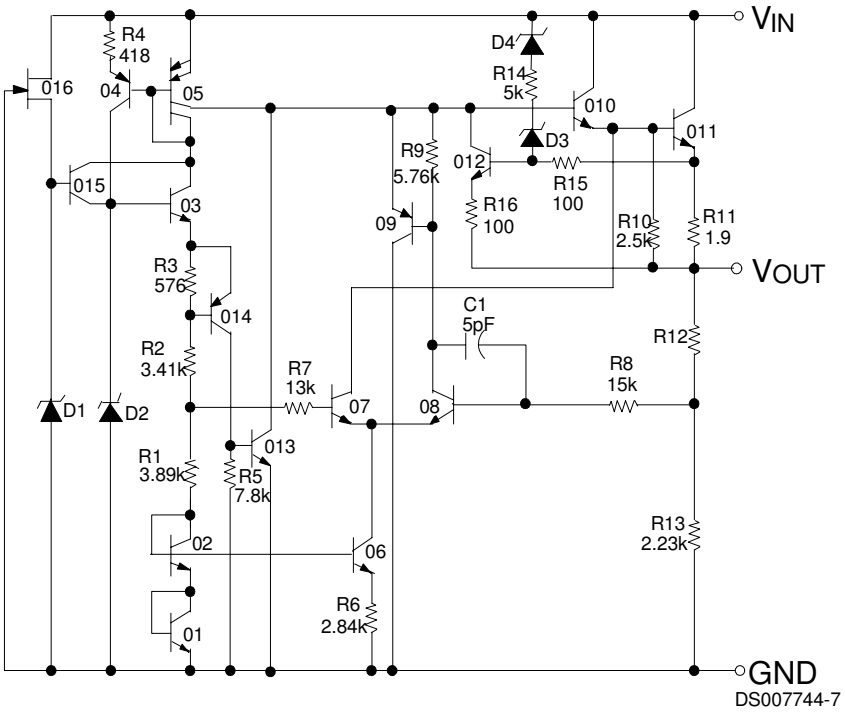



## Electrical Specifications

$V_{IN}$ = 8V; $I_{OUT}$ = 10mA; $C_{IN}$ = 0.33μF; $T_J$ = 25℃; unless otherwise specified

| Parameter | SYM | TEST CONDITION | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | | 4.8 | 5 | 5.2 | V |
| Line Regulation | $\Delta V_O$ | 7V ≤ $V_{IN}$ ≤ 18V | - | 20 | 100 | mV |
| Load Regulation | $\Delta V_O$ | 1mA ≤ $I_O$ ≤ 100mA | - | 20 | 100 | |
| Quiescent Current | $I_Q$ | | - | 0.5 | 1 | mA |
| Quiescent Current Change | $\Delta I_Q$ | 8V ≤ $V_{IN}$ ≤ 18V | - | 0.2 | - | |
| | | 1mA ≤ $I_O$ ≤ 100mA | - | 0.01 | - | |
| Ripple Rejection | $\Delta V_{IN}$ /$\Delta V_{OUT}$ | f =120Hz, $C_{IN}$=$C_{OUT}$=0.33uF, 8V ≤ $V_{IN}$ ≤ 16V | - | 52.5 | - | dB |
| Peak Output Current | $I_{PK}$ | | 100 | 150 | - | mA |
| Average Output Voltage Tempco | $\Delta V_O/\Delta T$ | $I_O$ = 10mA | - | 0.2 | - | mV/℃ |
| Minimum Value of Input Voltage Required to Maintain Line Regulation | $V_{IN}$ (Min) | $I_O$ = 10mA | - | 6.2 | 6.5 | V |

## Schematic


VIN
R4
418
D4
R14
5k
016
04
05
010
011
D3
R9
5.76k
012
R15
100
015
03
R16
100
09
R10
2.5k
R11
1.9
R3
576
VOUT
C1
5pF
014
R12
R2
3.41k
R7
13k
R8
15k
D1
D2
07
08
013
R1
3.89k
R5
7.8k
R13
2.23k
02
06
R6
2.84k
01
GND
DS007744-7

## Electrical Characteristics

$V_{IN}$ = 8V, $I_{OUT}$ = 10mA, $C_{IN}$ = 0.33µF, $T_J$ = 25℃, unless specified otherwise.

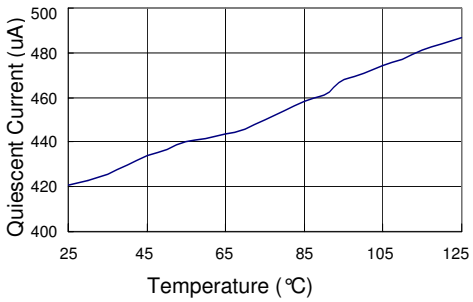



Fig.1 Quiescent Current vs. Temperature

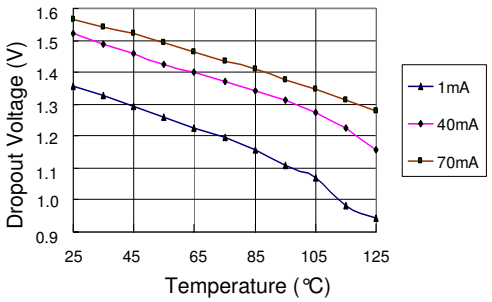



Fig. 2 Dropout Voltage vs. Temperature

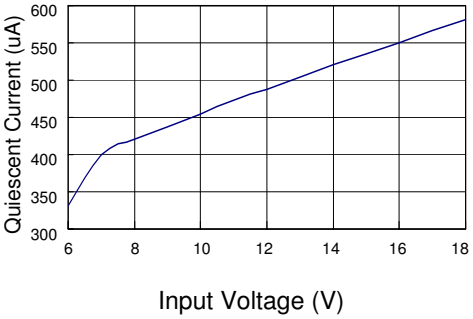



Fig. 3 Quiescent Current vs. Input Voltage

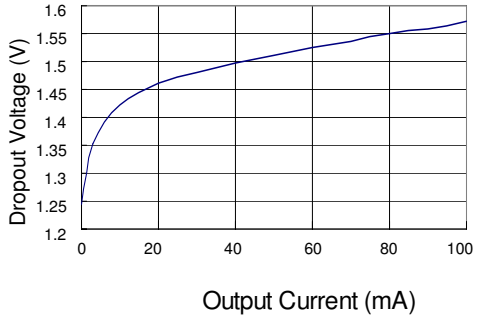



Fig. 4 Dropout Voltage vs. Output Current

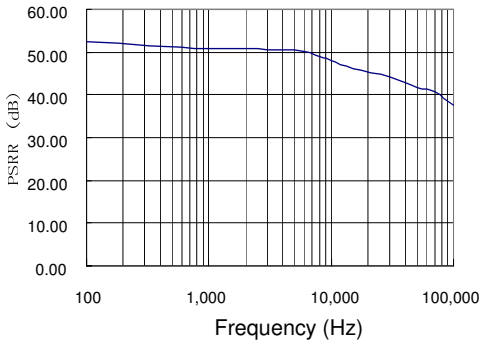



Fig. 5 Ripple Rejection

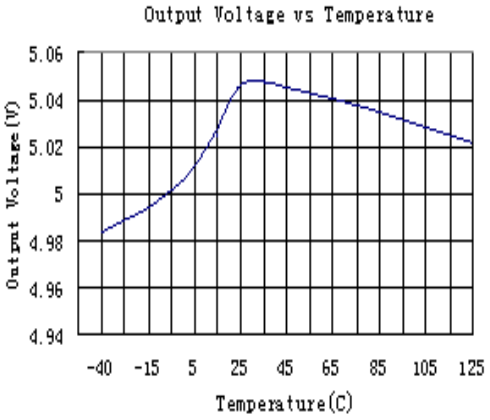
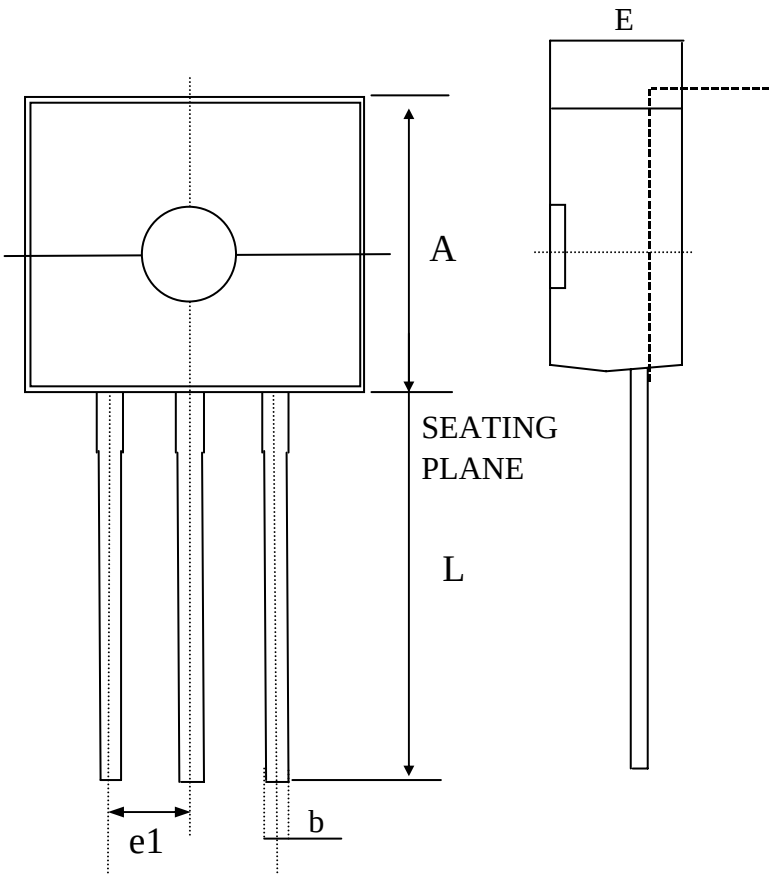


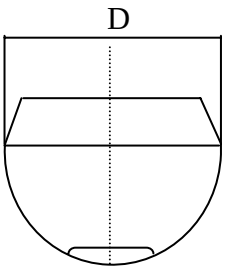

Fig.6 Output Voltage vs. Temperature

## Package Dimensions: TO-92

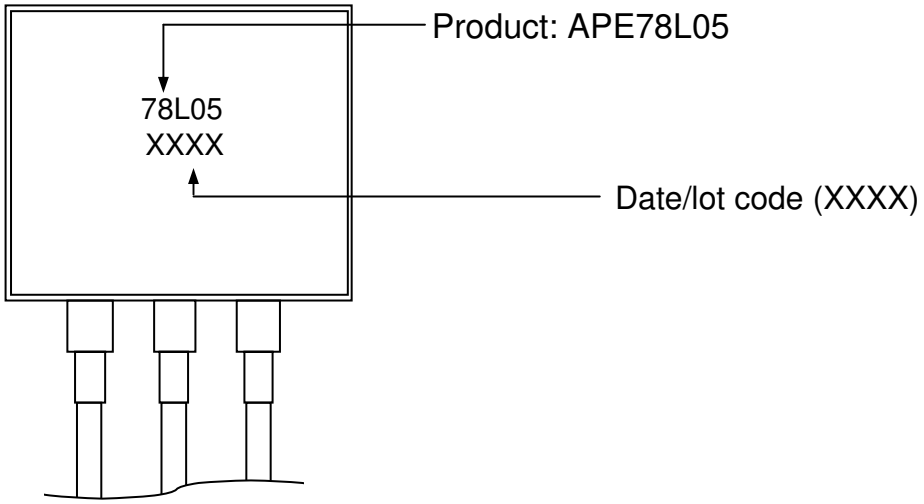



| SYMBOLS | Millimeters | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 4.32 | 4.83 | 5.34 |
| D | 4.1 | 4.8 | 5.3 |
| E | 3.1 | 3.9 | 4.7 |
| b | ---- | 0.38 | ----- |
| L | 12.7 | --- | ---- |
| e1 | ---- | 1.27 | ---- |

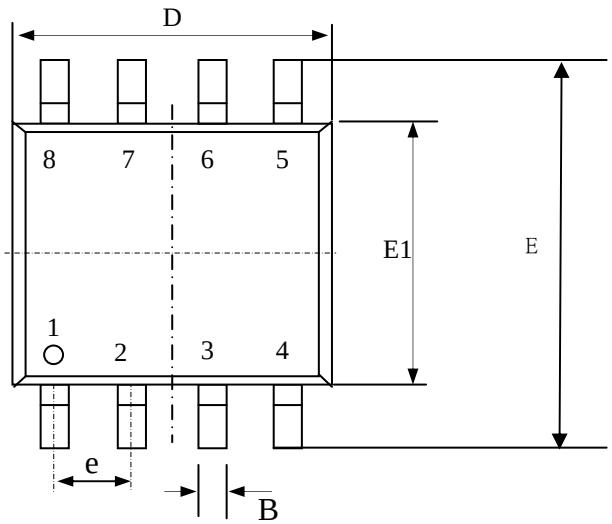
1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.



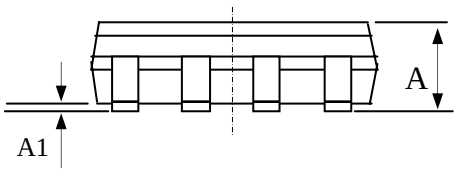

## Marking Information

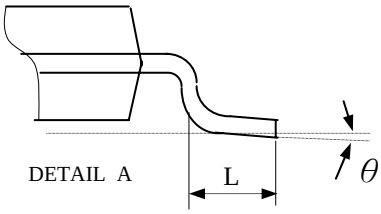


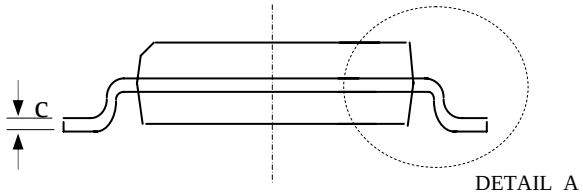
## Package Dimensions: SO-8




| SYMBOLS | Millimeters | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 1.35 | 1.55 | 1.75 |
| A1 | 0.10 | 0.18 | 0.25 |
| B | 0.33 | 0.41 | 0.51 |
| C | 0.19 | 0.22 | 0.25 |
| D | 4.80 | 4.90 | 5.00 |
| E1 | 3.80 | 3.90 | 4.00 |
| E | 5.80 | 6.15 | 6.50 |
| L | 0.38 | 0.71 | 1.27 |
| θ | 0 | 4.00 | 8.00 |
| e | 1.27 TYP | | |

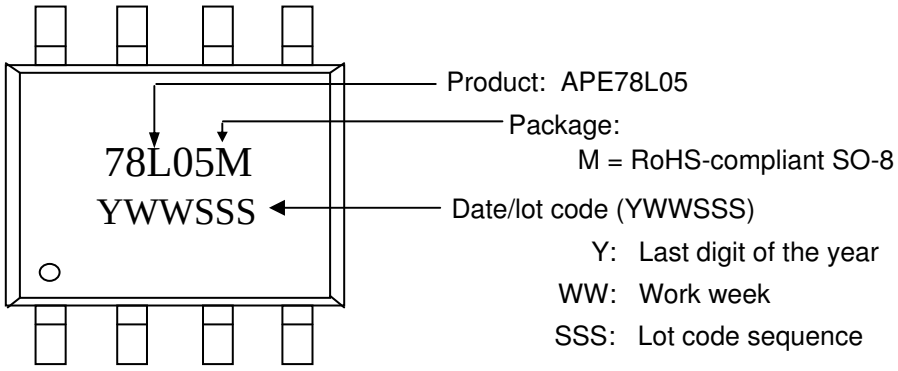


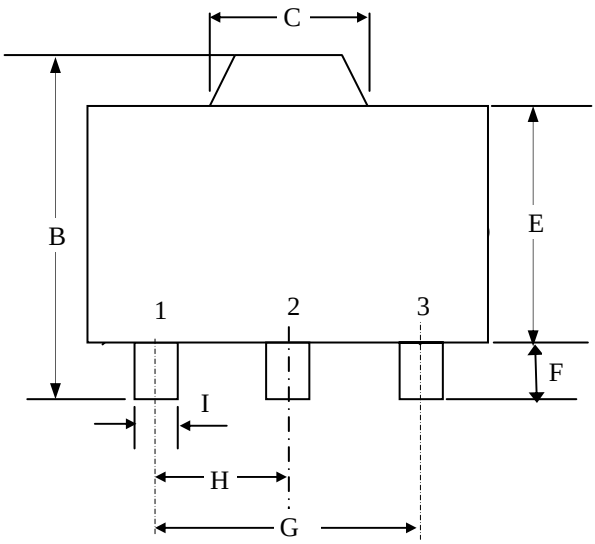




1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.

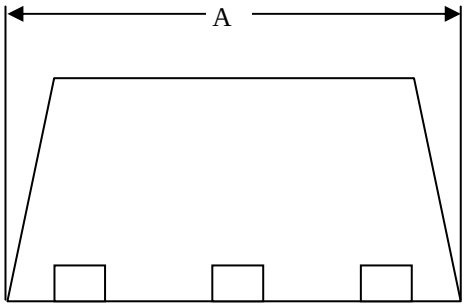
## Marking Information: SO-8



## Package Dimensions: SOT-89

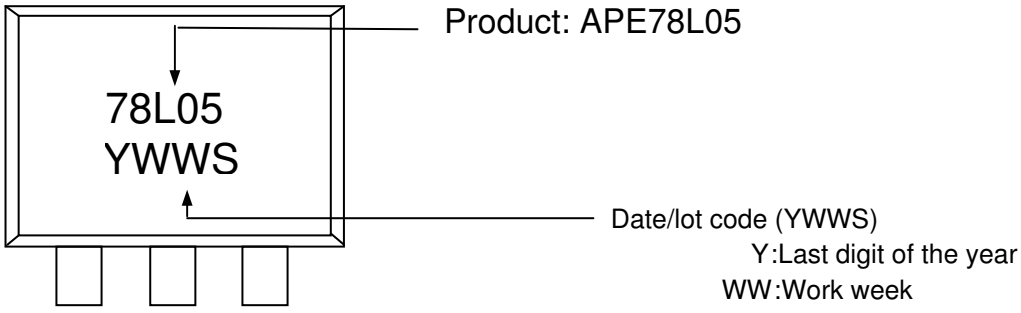



| SYMBOLS | Millimeters | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 4.40 | - | 4.60 |
| B | 4.05 | - | 4.25 |
| C | 1.40 | - | 1.75 |
| E | 2.40 | - | 2.60 |
| F | 0.89 | - | 1.20 |
| I | 0.35 | - | 0.55 |
| H | ---- | 1.50 | ---- |
| G | ---- | 3.00 | ---- |
| J | 1.40 | - | 1.60 |
| K | 0.35 | - | 0.43 |

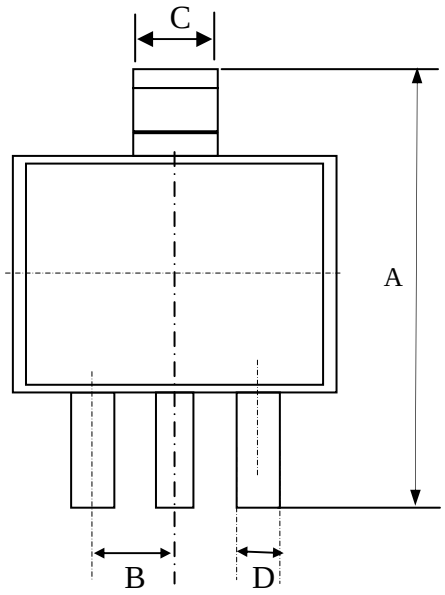



1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.

## Marking Information

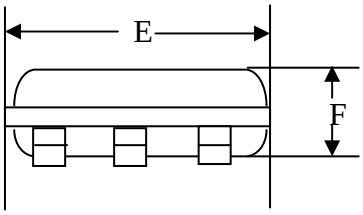


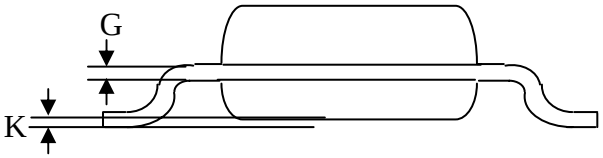
## Package Dimensions: SOT-223




| SYMBOLS | Millimeters | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 6.70 | 7.00 | 7.30 |
| B | --- | 2.30 | --- |
| C | 2.90 | 3.00 | 3.10 |
| D | 0.60 | 0.70 | 0.80 |
| G | 0.25 | 0.30 | 0.35 |
| E | 6.30 | 6.50 | 6.70 |
| F | 1.40 | 1.60 | 1.80 |
| K | 0.02 | 0.06 | 0.10 |

1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.




## Marking Information