# High Input Voltage & Low Power CMOS Voltage Regulators

## ■ General Description

The XT75XX series is a set of three-terminal middle current low voltage regulator implemented in CMOS technology. They can deliver 100mA output current and allow an input voltage as high as 40V. They are available with several fixed output voltages ranging from 3.0V to 8.0V. CMOS technology ensures low voltage drop and low quiescent current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

## ■ Applications

- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

## ■ Features

- Low power : 2μA（typ.）
- Low voltage drop: 100mV @ Iout=1mA
- Low temperature coefficient : ＜±100ppm/℃
- High input voltage : 40V
- Maximum output current : 100mA
- Little packages : TO-92，SOT89-3 SOT23-3L

## ■ Package

- SOT-89-3L
- TO-92
- SOT23-3L

## ■ Selection Table

| Part No. | Output Voltage | Tolerance | Package |
|---|---|---|---|
| XT7530 | 3.0 | ±2% | TO-92<br>SOT-89-3L<br>SOT23-3L |
| XT7533 | 3.3 | ±2% | |
| XT7536 | 3.6 | ±2% | |
| XT7544 | 4.4 | ±2% | |
| XT7550 | 5.0 | ±2% | |
| XT7580 | 8.0 | ±2% | |

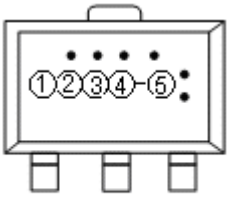
## ■ Ordering Information

XT75 ①②③④

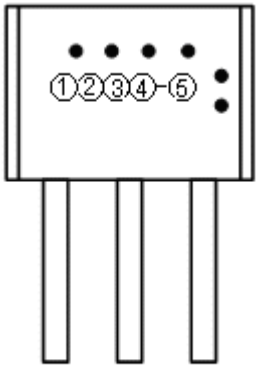
| Item | Symbol | Description |
|---|---|---|
| ①② | 30-80 | Output voltage:<br>Eg: ②=3，③=0 represents 3.0V |
| ③ | | Package type |
| | T | TO-92 |
| | P | SOT-89-3 |
| | M | SOT23-3L |
| ④ | | Device orientation |
| | R | Embossed Tape: Standard Feed |
| | L | Embossed Tape: Reverse Feed |

## ■ Marking Rule

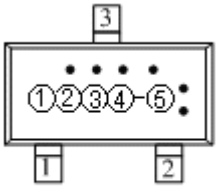
- SOT-89-3、TO-92



SOT-89-3L
(Top View)



TO-92
(Front View)



SOT-23-3L
(TOP VIEW)

**① ②Represents the product name**

| Symbol | Description |
|---|---|
| 75 | XT75◆◆◆◆ |

**③ ④Represents the output voltage**

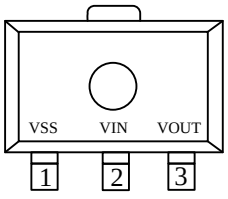
| Symbol | Description |
|---|---|
| ③④ | Output volatge：<br>Eg: ② ③= 30 Represents 3.0V；<br>② ③=33 Represents 3.3V. |

**⑤ Represents the assembly lot no.**

| Symbol | Description |
|---|---|
| H | Input high voltage (40V) |

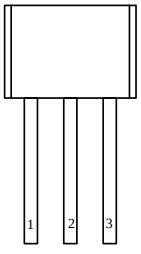
**Note: MARK around point - quality control mark**

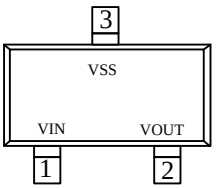
## ■ Pin Configuration



SOT-89-3L
(TOP VIEW)

TO-92
(Front View)



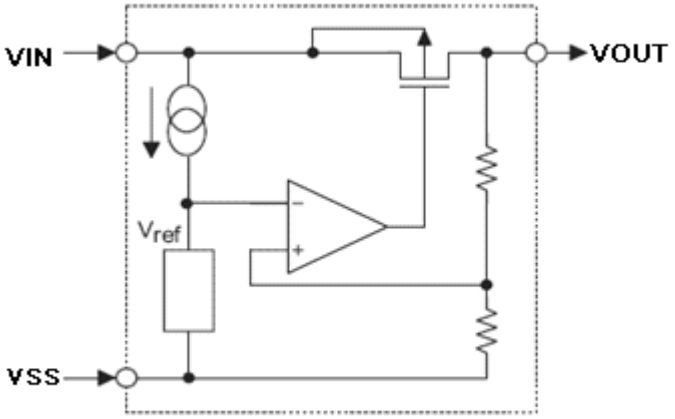



SOT-23-3L
(Top View)

## ■ Pin Assignment

| Pin Number | | | Pin Name | Function Description |
|---|---|---|---|---|
| TO-92 | SOT23-3 | SOT-89-3 | | |
| 2 | 1 | 2 | VIN | Power Input |
| 1 | 3 | 1 | VSS | Ground |
| 3 | 2 | 3 | VOUT | Output |

## ■ Function Block Diagram

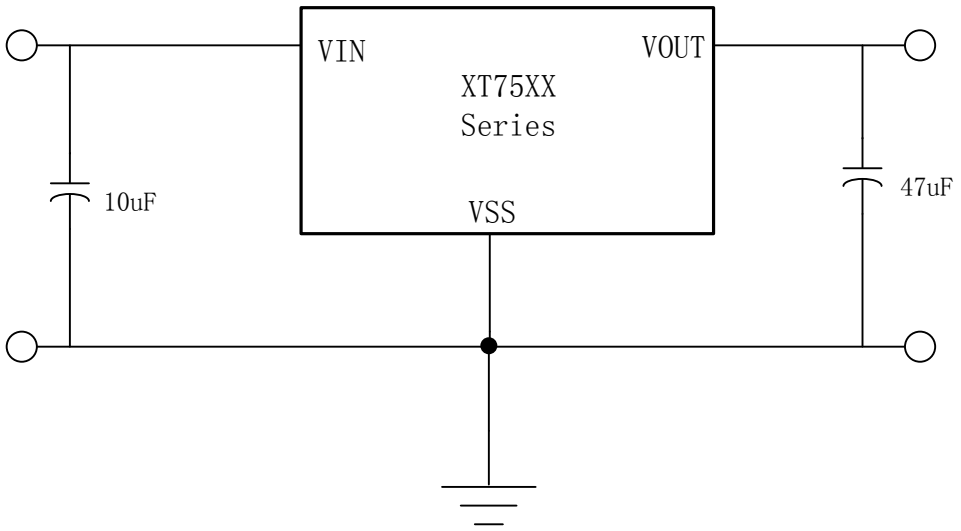



## ■ Absolute Maximum Ratings

| Parameter | | Symbol | Maximum Rating | Unit |
|---|---|---|---|---|
| Input Voltage | | Vin | -0.3～40 | V |
| Power Disspation | SOT-89-3 | Pd | 500 | mW |
| | TO-92 | | 300 | |
| Operating Ambient Temperature | | Topr | -40～+85 | ℃ |
| Storage Temperature | | Tstg | -40～+125 | ℃ |

**Caution**: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

## ■ Typical Application Circuits




## ■ Electrical Characteristics

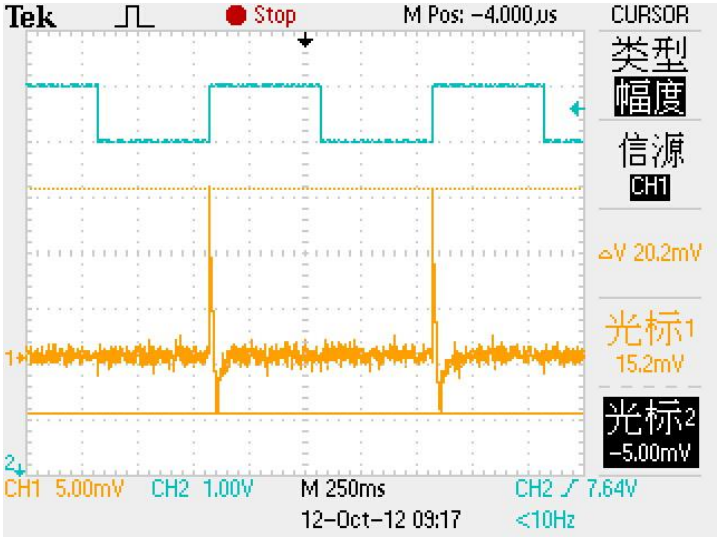
Ta=25℃

| Symbol | Parameters | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| | | $V_{IN}$ | Conditions | | | | |
| $V_{OUT}$ | Output Voltage Tolerance | $V_{OUT}$+2V | $I_{OUT}$=10mA | 0.98×$V_{OUT}$ | $V_{OUT}$[1] | 1.02×$V_{OUT}$ | V |
| $I_{OUT}$ | Output Current | $V_{OUT}$+2V | - | 40 | 100 | 150 | mA |
| △$V_{OUT}$ | Load Regulation | $V_{OUT}$+2V | 1mA≤$I_{OUT}$≤50mA | - | 60 | 150 | mV |
| $V_{DIF}$ | Voltage Drop | - | $I_{OUT}$=1mA | - | 100 | - | mV |
| $I_{SS}$ | Current Consumption | $V_{OUT}$+2V | No Load | - | 2 | | μA |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | Line Regulation | - | $V_{OUT}$+2V≤$V_{IN}$≤40<br>$I_{OUT}$=1mA | - | 0.025 | - | %/V |
| $V_{IN}$ | Input Voltage | - | - | - | - | 40 | V |
| $\frac{\Delta V_{OUT}}{\Delta T_a}$ | Temperature Coefficient | $V_{OUT}$+2V | $I_{OUT}$=10mA<br>-40℃≤$T_a$≤85℃ | - | ±0.45×$\frac{V_{OUT}}{3}$ | - | $\frac{mV}{℃}$ |

## ■ Typical Performance Characteristics

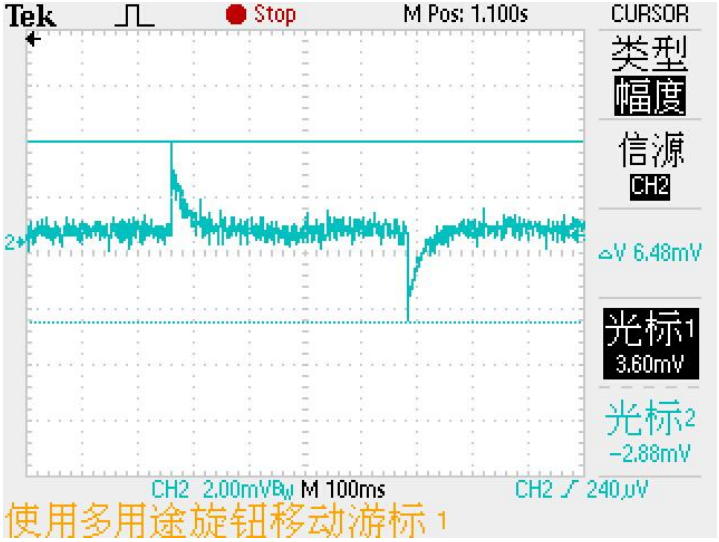
- **1、Input Voltage Transient Response**

  Test conditions:Vin=7.0V-8.0V, Iout=10mA, Cin=Cout=10uF, F= 10Hz

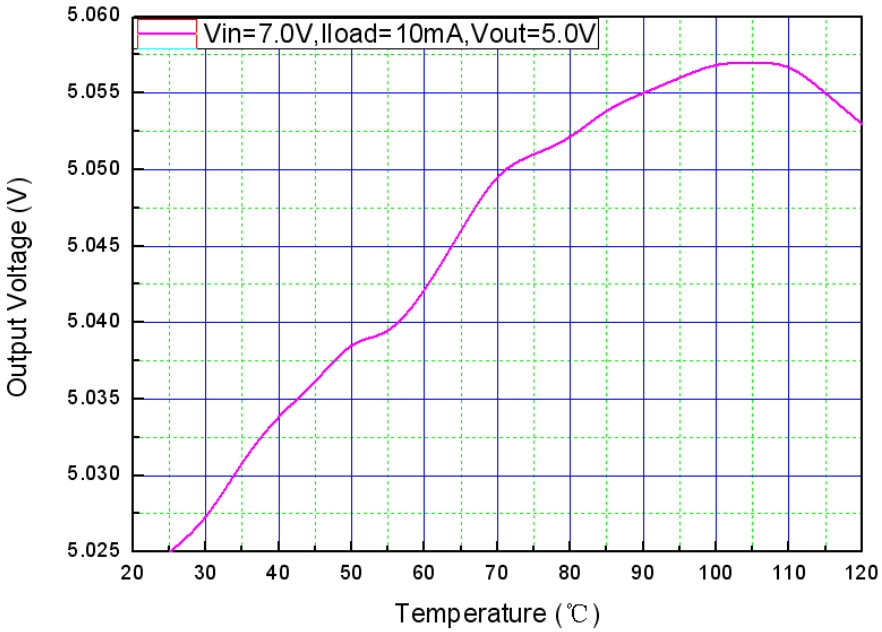



- **2、Load Transient Response**

  Test conditions:Vin=CE=7.0V, ,Cin=Cout=10uF, Iout=10-70mA

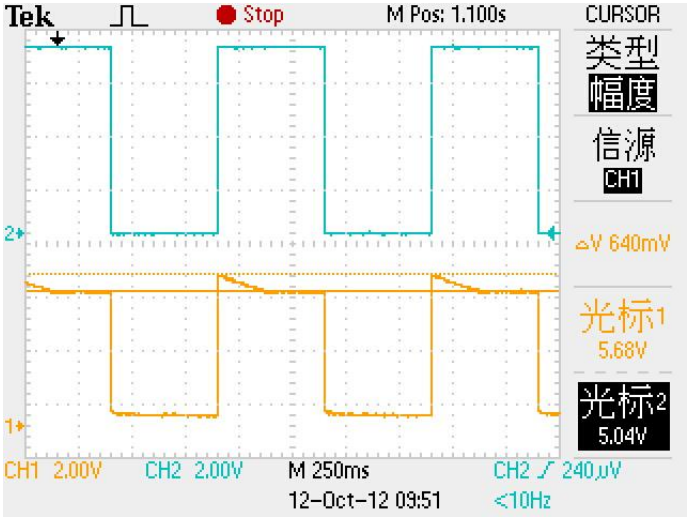


- **3、Temperature profile**



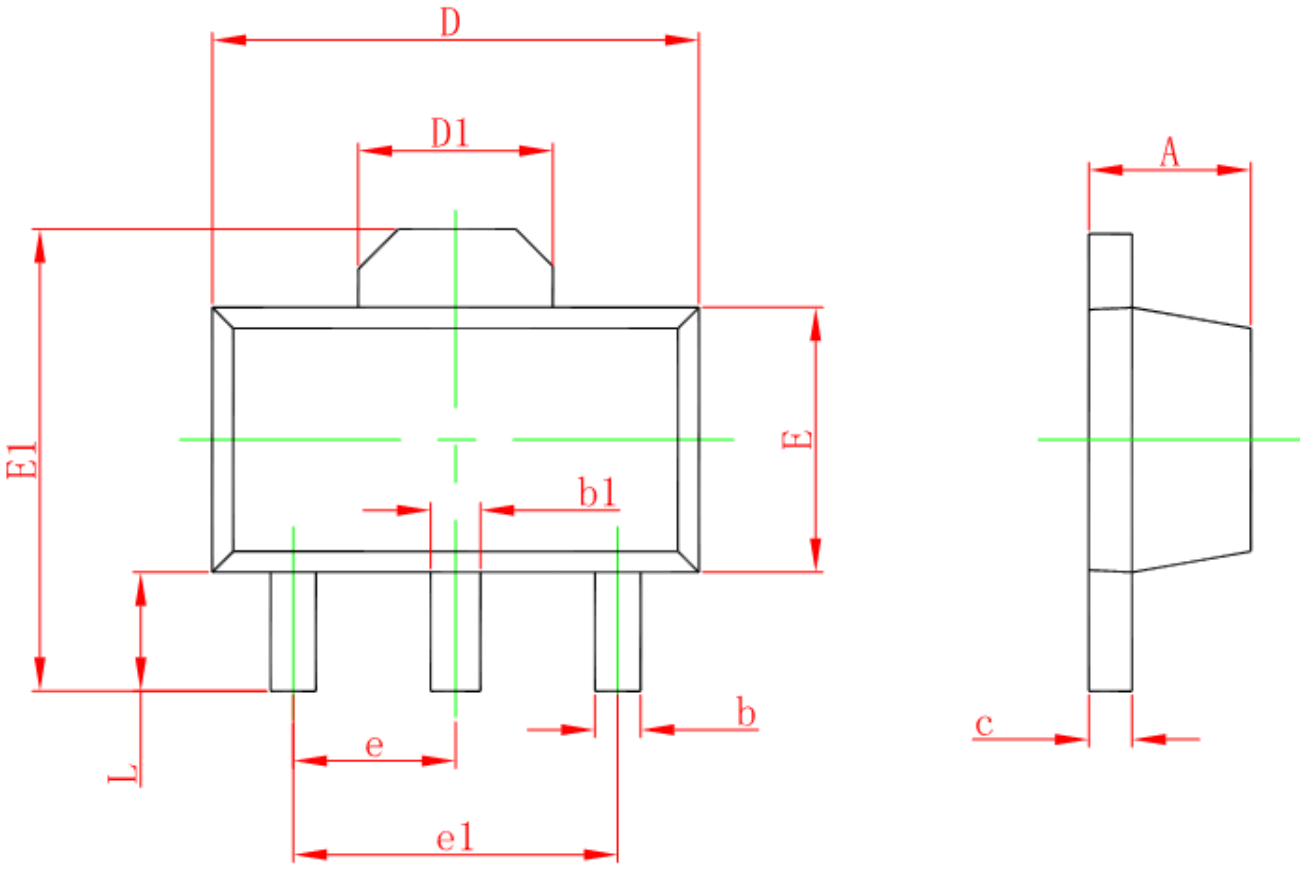

- **4、Voltage overshoot**

Test conditions:Vin=0V-7.0V, Iout=10mA, Cin=Cout=10uF



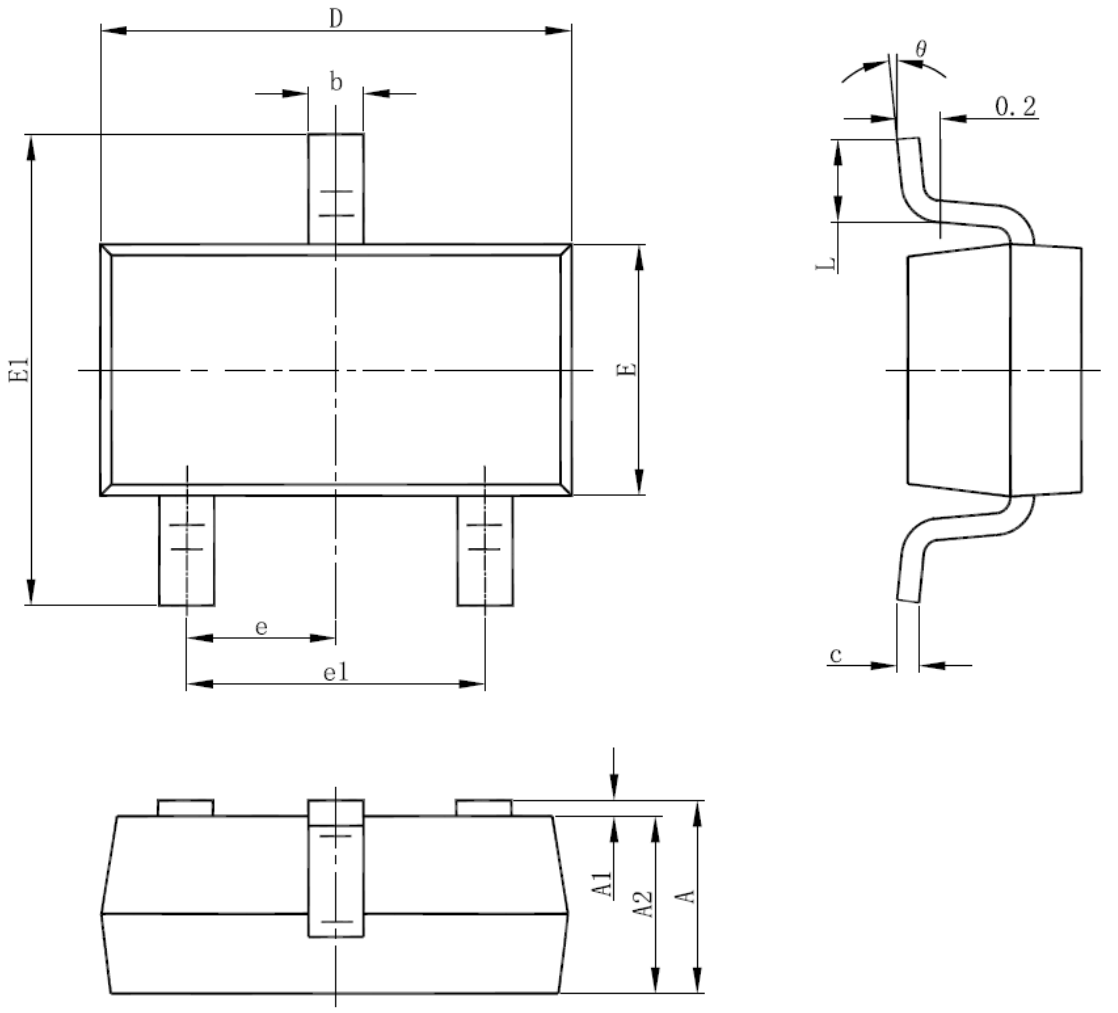
## ■ Package Information

- **SOT-89-3L**



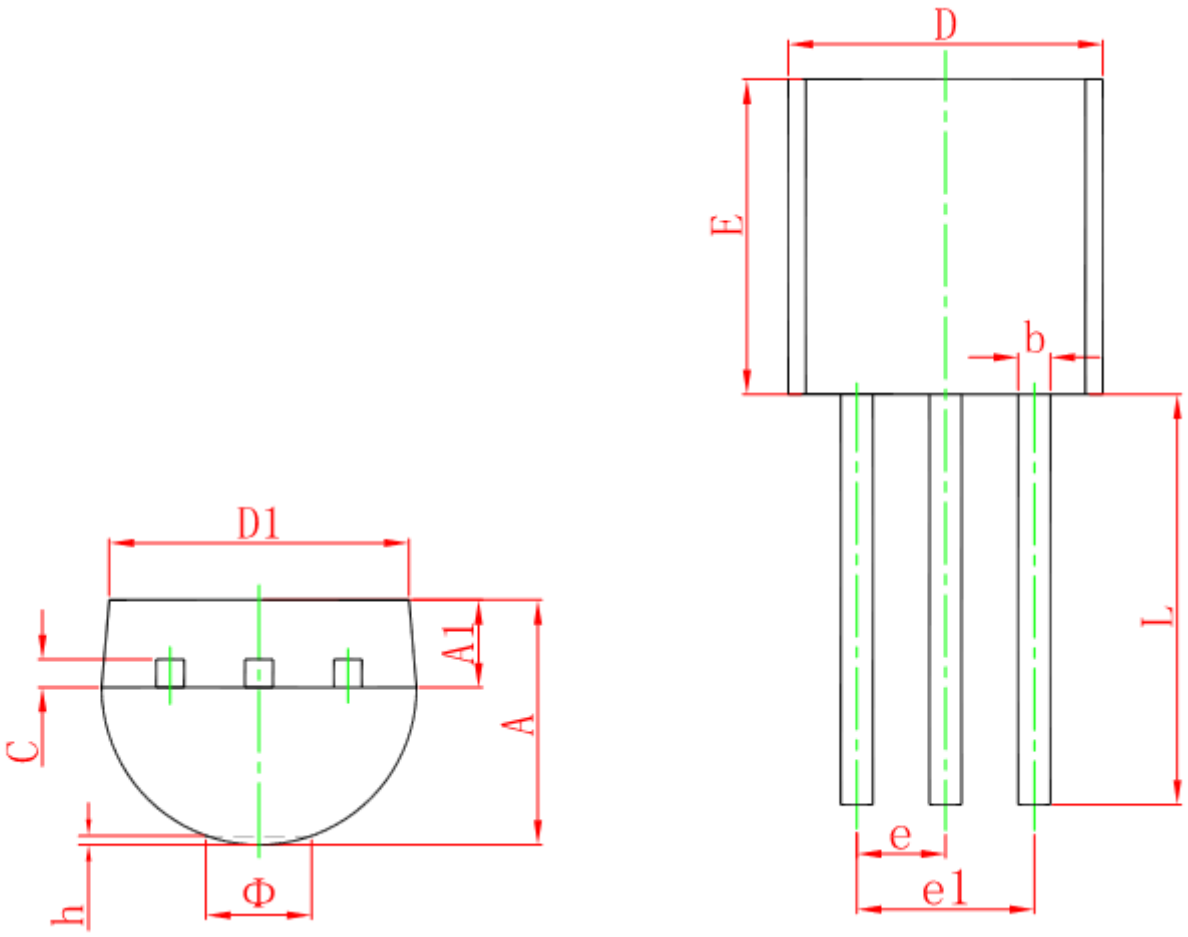

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF. | | 0.061 REF. | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP. | | 0.060 TYP. | |
| e1 | 3.000 TYP. | | 0.118 TYP. | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |

- **SOT23-3L**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

- **TO-92**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 3.300 | 3.700 | 0.130 | 0.146 |
| A1 | 1.100 | 1.400 | 0.043 | 0.055 |
| b | 0.380 | 0.550 | 0.015 | 0.022 |
| c | 0.360 | 0.510 | 0.014 | 0.020 |
| D | 4.400 | 4.700 | 0.173 | 0.185 |
| D1 | 3.430 | | 0.135 | |
| E | 4.300 | 4.700 | 0.169 | 0.185 |
| e | 1.270 TYP | | 0.050 TYP | |
| e1 | 2.440 | 2.640 | 0.096 | 0.104 |
| L | 14.100 | 14.500 | 0.555 | 0.571 |
| Φ | | 1.600 | | 0.063 |
| h | 0.000 | 0.380 | 0.000 | 0.015 |