# CJ6376 Series

## ■ INTRODUCTION

The CJ6376 Series are a group of positive voltage regulators manufactured by CMOS technologies with low power consumption and low dropout voltage, which provide large output currents even when the difference of the input-out-put voltage is small.

The CJ6376 Series can deliver 300 mA output current and allow an input voltage as high as 28V. The series are very suitable for the battery powered equipments, such as RF applications and other systems requiring a quiet voltage source.

## ■ APPLICATIONS

● Cordless Phones

● Radio control systems

● Laptop, Palmtops and PDAs

● Single-lens reflex DSC

● PC peripherals with memory

● LAN Cards

● Ultra Low Power Microcontrollers
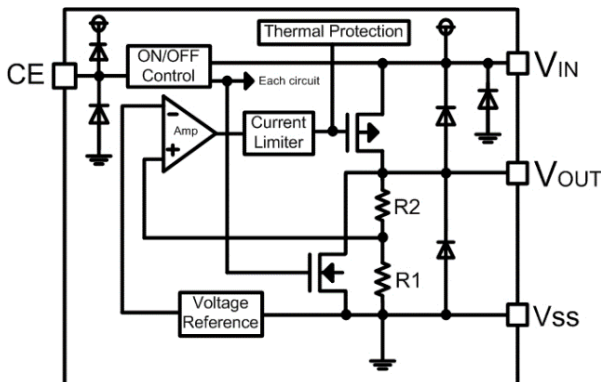
● Wireless Communication Equipments

● Portable Audio Video Equipments

● Car Navigation Systems

## ■ FEATURES

● Low Quiescent Current: 2μA

● Operating Voltage Range: 2.5V～36V

● Output Current: 300mA

● Low Dropout Voltage：
200mV@100mA($V_{OUT}$=3.3V)

● Output Voltage: 1.2~ 12V

● High Accuracy: ±2%/±1%(Typ.)

● High Power Supply Rejection Ratio:
70dB@1kHz

● Low Output Noise:
27x$V_{OUT}$ μ$V_{RMS}$(10Hz~100kHz)

● Excellent Line and Load Transient Response

● Built-in Current Limiter, Short-Circuit Protection
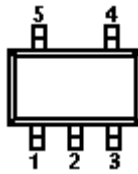
● Over-Temperature Protection

## ■ BLOCK DIAGRAM



## ■ ORDER INFORMATION

CJ6376①②③④

| DESIGNATOR | SYMBOL | DESCRIPTION |
|---|---|---|
| ① | A | Standard |
| | B | High Active, pull-down resistor built-in, with $C_{OUT}$ discharge resistor |
| ②③ | Integer | Output Voltage e.g.3.3V=②:3, ③:3 |
| ④ | M/MC/MY | Package:SOT-23-3L |
| | M/MR/MF | Package:SOT-23-5L |
| | G/GW/GL | Package:SOT-223 |

## Pin Configuration
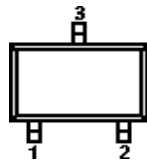
SOT-23-3L  SOT-23-5L  SOT-223
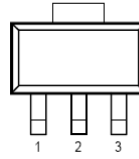
### SOT-23-3L

| PIN NUMBER | | | PIN NAME | FUNCTION |
|---|---|---|---|---|
| CJ6376AxxM/MC/MY | | | | |
| M | MC | MY | | |
| 1 | 3 | 3 | $V_{SS}$ | Ground |
| 2 | 2 | 1 | $V_{OUT}$ | Output |
| 3 | 1 | 2 | $V_{IN}$ | Power Input |

### SOT-23-5L

| PIN NUMBER | | | PIN NAME | FUNCTION |
|---|---|---|---|---|
| CJ6376BxxM | CJ6376AxxMF/MR | | | |
| M | MF | MR | | |
| 1 | 1 | 2 | $V_{IN}$ | Power Input |
| 2 | 2 | 1 | $V_{SS}$ | Ground |
| 3 | / | / | CE | Chip Enable Pin |
| 4 | 3/4 | 4/5 | NC | No Connection |
| 5 | 5 | 3 | $V_{OUT}$ | Output |

### SOT-223

| PIN NUMBER | | | PIN NAME | FUNCTION |
|---|---|---|---|---|
| CJ6376AxxG/GW/GL | | | | |
| G | GW | GL | | |
| 1 | 1 | 2 | $V_{IN}$ | Power input |
| 2 | 3 | 1 | $V_{SS}$ | Ground |
| 3 | 2 | 3 | $V_{OUT}$ | Output |

# Electrical Characteristics

■ **ABSOLUTE MAXIMUM RATINGS**[1]

**(Unless otherwise specified, $T_A$=25°C)**

| PARAMETER | | SYMBOL | RATINGS | UNITS |
|---|---|---|---|---|
| Input Voltage[2] | | $V_{IN}$ | -0.3~40 | V |
| Output Voltage[2] | | $V_{OUT}$ | -0.3~13 | V |
| CE Pin Voltage | | $V_{CE}$ | -0.3~33 | V |
| Output Current | | $I_{OUT}$ | 600 | mA |
| Power Dissipation | SOT-23-3L | $P_D$ | 0.3 | W |
| | SOT-23-5L | | 0.5 | W |
| | SOT-223 | | 0.8 | W |
| Operating Ambient Temperature Range | | $T_A$ | -40~85 | °C |
| Operating Junction Temperature Range[3] | | $T_j$ | -40~125 | °C |
| Storage Temperature | | $T_{stg}$ | -40~125 | °C |
| Lead Temperature(Soldering, 10 sec) | | $T_{solder}$ | 260 | °C |

(1) Stresses beyond those listed under *absolute maximum ratings may* cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *recommended operating conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods my affect device reliability.

(2) All voltages are with respect to network ground terminal.

(3) This IC includes over temperature protection that is intended to protect the device during momentary over-load. Junction temperature will exceed 125°C when over temperature protection is active. Continuous operation above the specified maximum operating junction temperature may impair device reliability.

■ **RECOMMENDED OPERATING CONDITIONS**

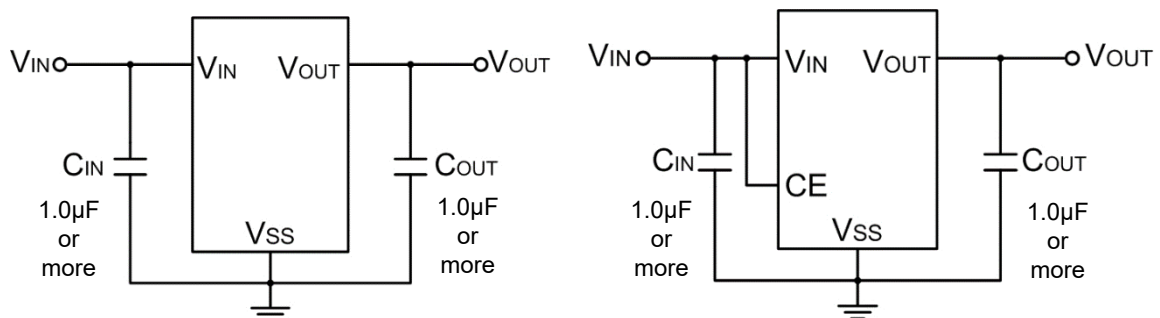| PARAMETER | MIN. | NOM. | MAX. | UNITS |
|---|---|---|---|---|
| Supply voltage at $V_{IN}$ | 2.5 | | 36 | V |
| Operating junction temperature range, $T_j$ | -40 | | 125 | °C |
| Operating free air temperature range, $T_A$ | -40 | | 85 | °C |

## Electrical Characteristics

**CJ6376 Series**    ($V_{IN}=V_{OUT}+1V$, $C_{IN}=C_{OUT}=1\mu F$, $T_A=25°C$, unless otherwise specified)

| PARAMETER | SYMBOL | CONDITIONS | | MIN. | TYP.[4] | MAX. | UNITS |
|---|---|---|---|---|---|---|---|
| Input Voltage | $V_{IN}$ | | | 2.5 | — | 36 | V |
| Output Voltage Range | $V_{OUT}$ | | | 2.1 | — | 12 | V |
| DC Output Accuracy | | $I_{OUT}=10mA$ | | -2 | — | 2 | % |
| | | | | -1 | — | 1 | % |
| Dropout Voltage | $V_{dif}$[5] | $I_{OUT}=100mA$, $V_{OUT}=3.3V$ | | — | 200 | — | mV |
| Supply Current | $I_{SS}$ | $I_{OUT}=0A$ | $1.2V<V_{OUT}\leq7.0V$ | — | 2 | 5 | µA |
| | | | $7.0V<V_{OUT}\leq12V$ | — | 3 | 6 | µA |
| Line Regulation | $\dfrac{\Delta V_{OUT}}{V_{OUT}\times\Delta V_{IN}}$ | $I_{OUT}=10mA$ $V_{OUT}+1V\leq V_{IN}\leq36V$ | | — | 0.01 | 0.3 | %/V |
| Load Regulation | $\underline{\Delta}V_{OUT}$ | $V_{IN}=V_{OUT}+1V$, $1mA\leq I_{OUT}\leq100mA$ | | — | 10 | — | mV |
| Temperature Coefficient | $\dfrac{\Delta V_{OUT}}{V_{OUT}\times\Delta T_A}$ | $I_{OUT}=40mA$, $-40°C<T_A<85°C$ | | | 50 | | ppm |
| Output Current Limit | $I_{LIM}$ | $V_{OUT}=0.5 \times V_{OUT(Normal)}$, Vin=5V | | 350 | 600 | | mA |
| Short Current | $I_{SHORT}$ | $V_{OUT}=V_{SS}$ | | — | 100 | — | mA |
| Power Supply Rejection Ratio | PSRR | $I_{OUT}=50mA$ | 100Hz | | 75 | | dB |
| | | | 1kHz | — | 70 | — | |
| | | | 10kHz | — | 55 | — | |
| | | | 100kHz | — | 40 | — | |
| Output Noise Voltage | $V_{ON}$ | BW=10Hz to 100kHz | | — | $27 \times V_{OUT}$ | — | $\mu V_{RMS}$ |
| Thermal Shutdown Temperature | $T_{SD}$ | —— | | — | 160 | — | °C |
| Thermal Shutdown Hysteresis | $\Delta T_{SD}$ | —— | | — | 20 | — | °C |
| Standby Current | $I_{STBY}$ | $CE=V_{SS}$ | | | | 0.5 | uA |
| CE "High" Voltage | $V_{CE}$"H" | | | 1.5 | | $V_{IN}$ | V |
| CE "Low" Voltage | $V_{CE}$"L" | | | | | 0.3 | V |
| $C_{OUT}$ Auto-Discharge Resistance | $I_{SHORT}$ | $V_{IN}=5V$, $V_{OUT}=3.0V$, $V_{CE}=V_{SS}$ | | — | 150 | — | Ω |

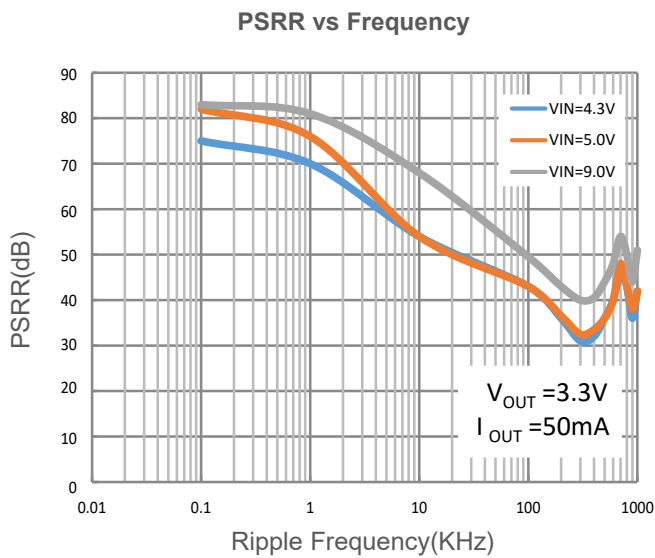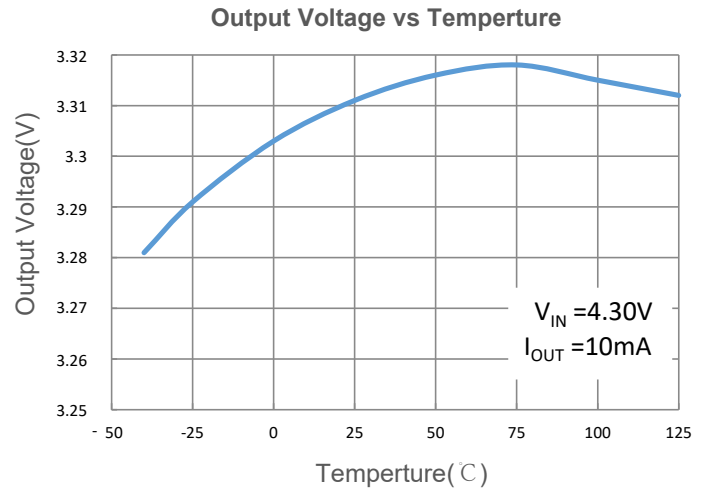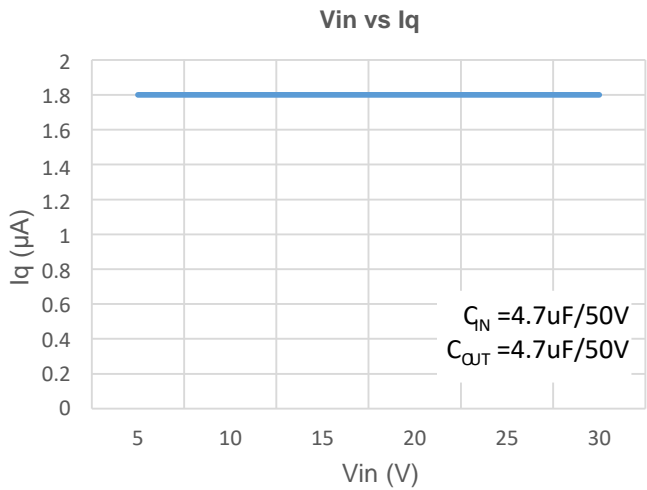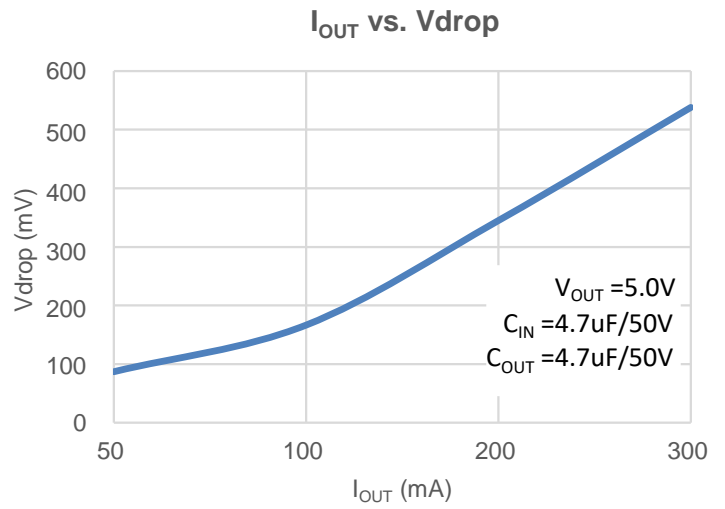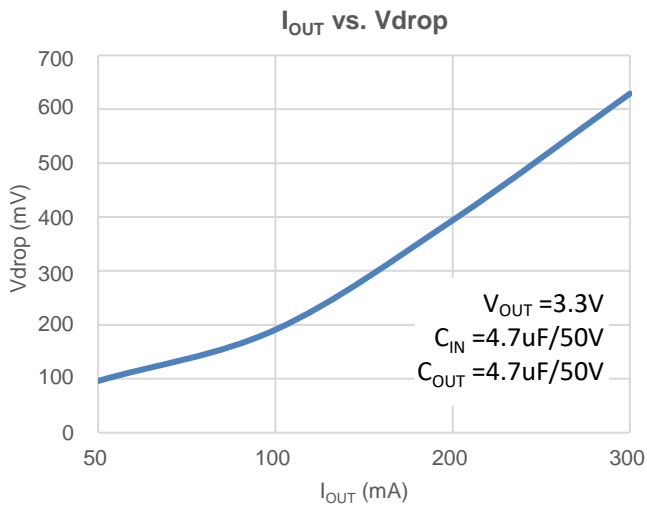(4) Typical numbers are at 25°C and represent the most likely norm.

(5)$V_{dif}$：The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of $V_{OUT}$ (E).

■ **TYPICAL APPLICATION CIRCUIT**

# Typical Characteristics

**(Unless otherwise specified, $T_A$=25°C)**
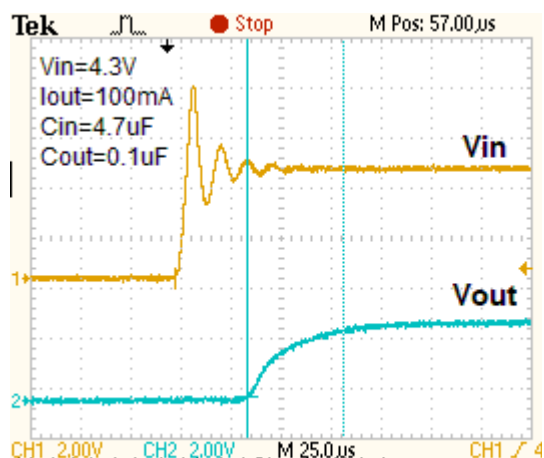
**$I_{OUT}$ vs. Vdrop**

$V_{OUT}$ =3.3V
$C_{IN}$ =4.7uF/50V
$C_{OUT}$ =4.7uF/50V

**$I_{OUT}$ vs. Vdrop**

$V_{OUT}$ =5.0V
$C_{IN}$ =4.7uF/50V
$C_{OUT}$ =4.7uF/50V

**Vin vs Iq**

$C_{IN}$ =4.7uF/50V
$C_{OUT}$ =4.7uF/50V

**Output Voltage vs Temperture**

$V_{IN}$ =4.30V
$I_{OUT}$ =10mA

**PSRR vs Frequency**

VIN=4.3V
VIN=5.0V
VIN=9.0V

$V_{OUT}$ =3.3V
$I_{OUT}$ =50mA

# Typical Characteristics

**(Unless otherwise specified, T<sub>A</sub>=25°C)**
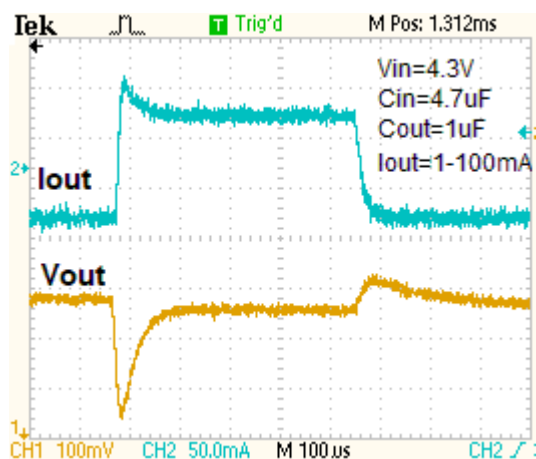
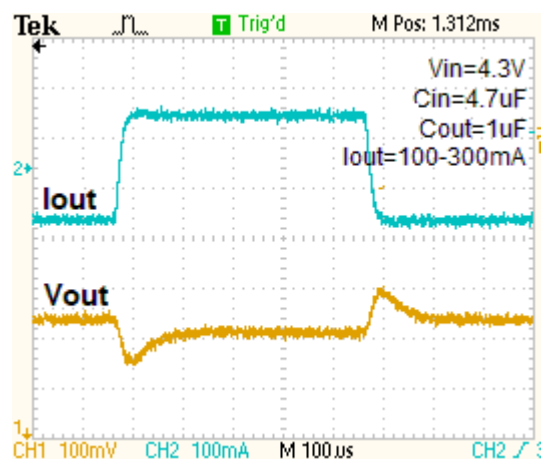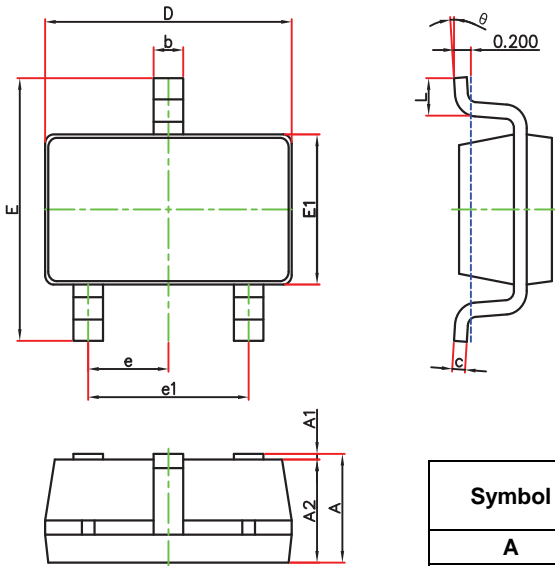**Power Up Response**
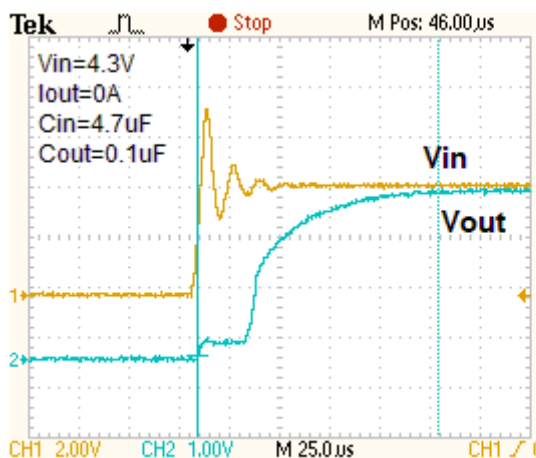


**Power Up Response**



**Load Transient Response**



**Load Transient Response**

## SOT-23-3L Package Outline Dimensions



| 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 | 2.650 | 2.950 | 0.104 | 0.116 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| 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° |

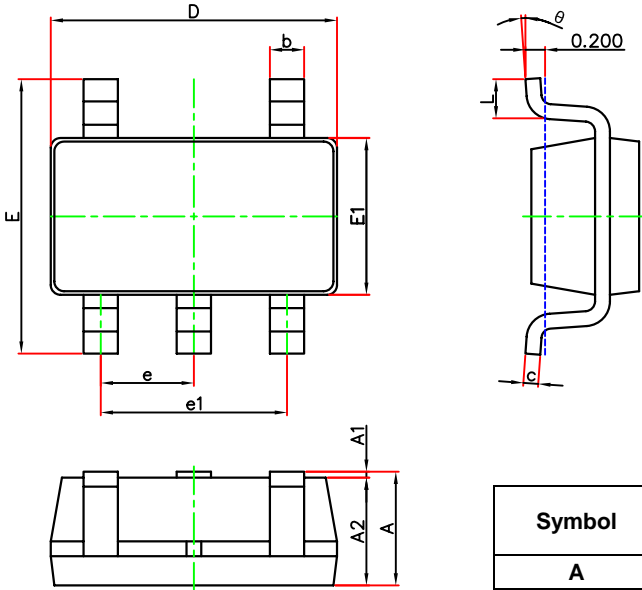## SOT-23-3L Suggested Pad Layout
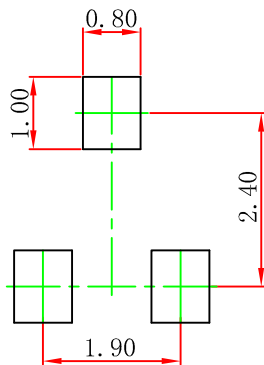


Note:
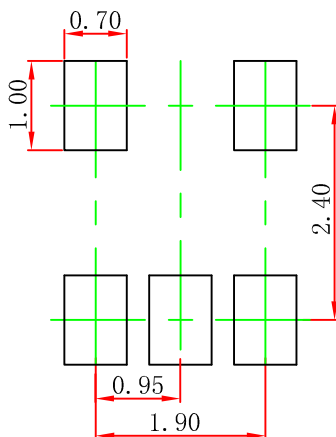1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05mm.
3. The pad layout is for reference purposes only.

## SOT-23-5L Package Outline Dimensions



| 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 | 2.650 | 2.950 | 0.104 | 0.116 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| 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° |

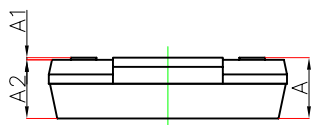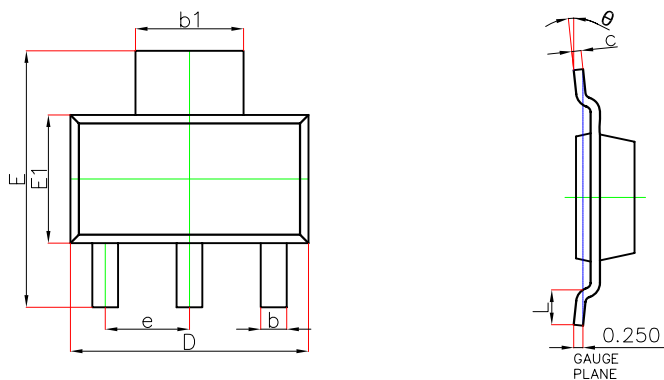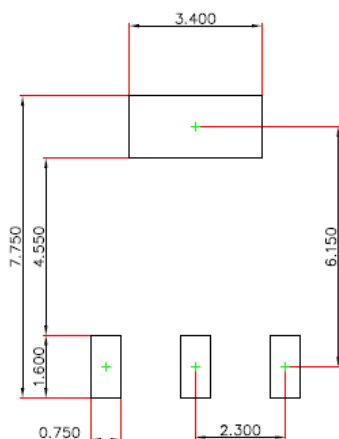## SOT-23-5L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

# SOT-223 Package Outline Dimensions

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|------|------|------|------|
| | Min. | Max. | Min. | Max. |
| A | —— | 1.800 | —— | 0.071 |
| A1 | 0.020 | 0.100 | 0.001 | 0.004 |
| A2 | 1.500 | 1.700 | 0.059 | 0.067 |
| b | 0.660 | 0.840 | 0.026 | 0.033 |
| b1 | 2.900 | 3.100 | 0.114 | 0.122 |
| c | 0.230 | 0.350 | 0.009 | 0.014 |
| D | 6.300 | 6.700 | 0.248 | 0.264 |
| E | 6.700 | 7.300 | 0.264 | 0.287 |
| E1 | 3.300 | 3.700 | 0.130 | 0.146 |
| e | 2.300(BSC) | | 0.091(BSC) | |
| L | 0.750 | —— | 0.030 | —— |
| θ | 0° | 10° | 0° | 10° |

# SOT-223 Suggested Pad Layout

**Note:**
1. Controlling dimension: in millimeters.
2. General tolerance: ±0.050mm.
3. The pad layout is for reference purposes only.

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