# SOT-23 Plastic-Encapsulate Transistors

## Features

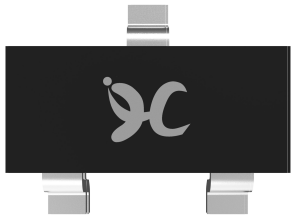
- Complementary to MMBT5551
- Power dissipation of 300mW
- High stability and high reliability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C

**Collector-Base Voltage**
VCBO -160V
**Collector Current**
-0.6 Ampere

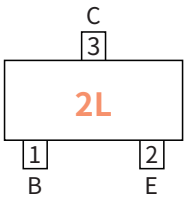
## Mechanical Data

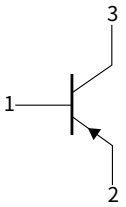
- Case: SOT-23
  Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

**SOT-23**



## Function Diagram




## Maximum Ratings (Ta=25°C Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | VALUE |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | V | -160 |
| Collector-Emitter Voltage | $V_{CEO}$ | | -150 |
| Emitter-Base Voltage | $V_{EBO}$ | | -5.0 |
| Collector Current | $I_C$ | A | -0.6 |
| Collector Power Dissipation | $P_C$ | mW | 300 |
| Storage temperature | $T_{stg}$ | °C | -55 ~+150 |
| Junction temperature | $T_j$ | °C | -55 ~+150 |
| Typical Thermal Resistance | $R_{\theta J-A}$ | °C /W | 417 |

## Electrical Characteristics (Ta=25°C Unless otherwise noted)

| PARAMETER | SYMBOL | UNIT | Condition | Min | Max |
|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | V | $I_C$=-100μA, $I_E$=0 | -160 | — |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | | $I_C$=-1.0mA, $I_B$=0 | -150 | — |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | | $I_E$=-10μA, $I_C$=0 | -5.0 | — |
| Collector-Base cut-off current | $I_{CBO}$ | nA | $V_{CB}$= -120V, $I_B$=0 | — | -100 |
| Emitter-Base cut-off current | $I_{EBO}$ | | $V_{EB}$= -4.0V, $I_C$=0 | — | -100 |
| DC Current Gain | $h_{FE}$ | — | $I_C$= -1.0mA, $V_{CE}$= -5.0V | 80 | — |
| | | | $I_C$= -10mA, $V_{CE}$= -5.0V | 100 | 300 |
| | | | $I_C$= -50mA, $V_{CE}$= -5.0V | 30 | — |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)1}$ | V | $I_C$= -10mA, $I_B$= -1.0mA | — | -0.2 |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)2}$ | | $I_C$= -50mA, $I_B$= -5.0mA | — | -0.5 |
| Base-Emitter Saturation Voltage | $V_{BE(sat)1}$ | | $I_C$= -10mA, $I_B$= -1.0mA | — | -1.0 |
| Base-Emitter Saturation Voltage | $V_{BE(sat)2}$ | | $I_C$= -50mA, $I_B$= -5.0mA | — | -1.0 |

## Small-signal Characteristics

| ITEM | SYMBOL | Condition | UNIT | Min | Max |
|---|---|---|---|---|---|
| Transition frequency | $f_T$ | $I_C$= 10mA, $V_{CE}$= -5.0V, f=30MHz | MHz | 100 | — |

## Ordering Information

| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| SOT-23 | R1 | 0.008 | 3000 | 30000 | 120000 | 7'' |

## Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

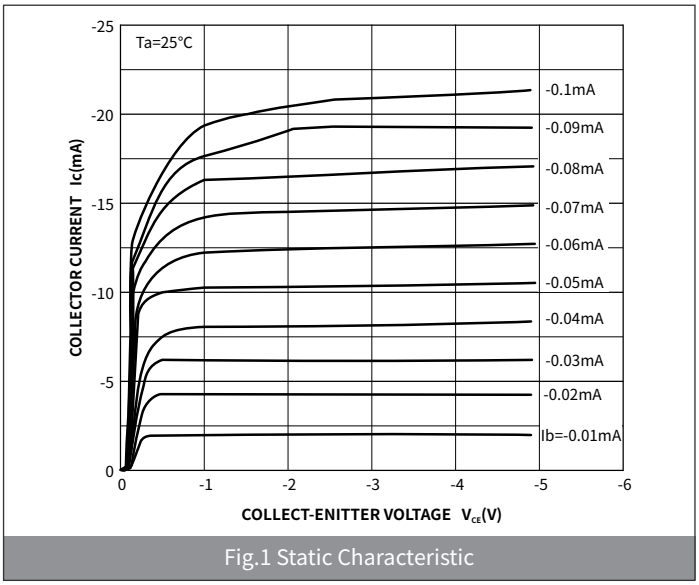



Fig.1 Static Characteristic

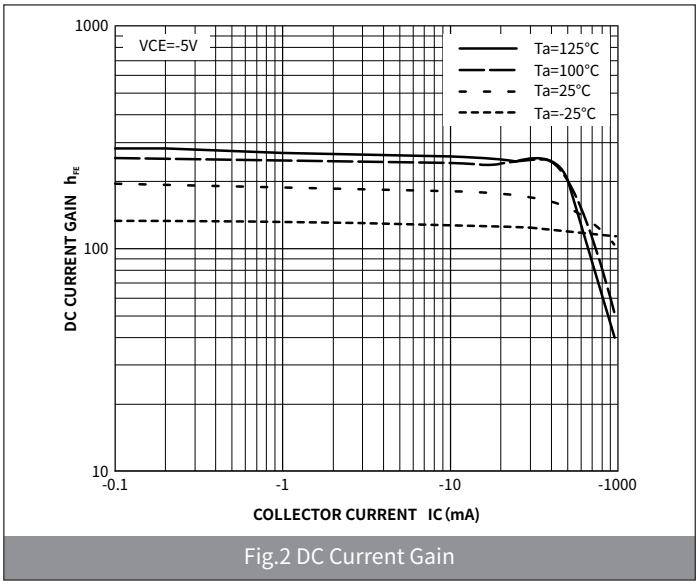



Fig.2 DC Current Gain

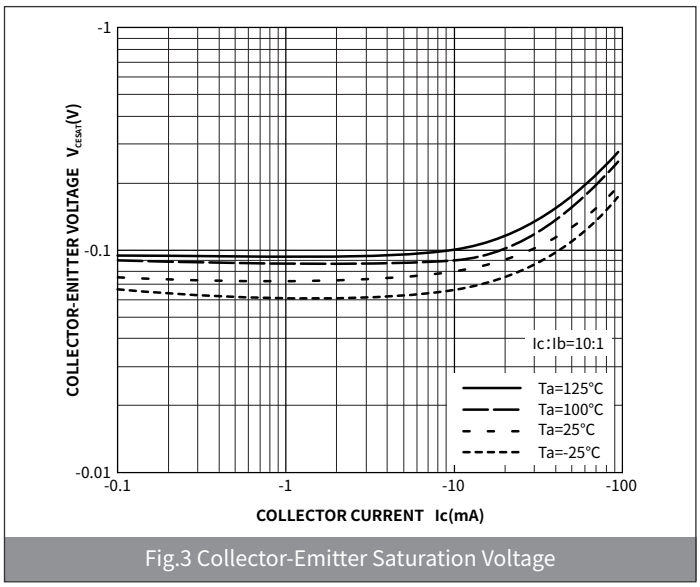



Fig.3 Collector-Emitter Saturation Voltage

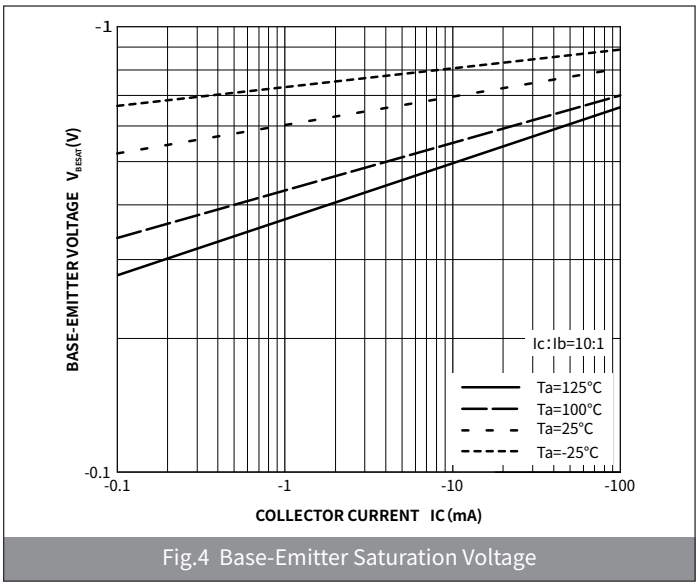



Fig.4 Base-Emitter Saturation Voltage

## Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

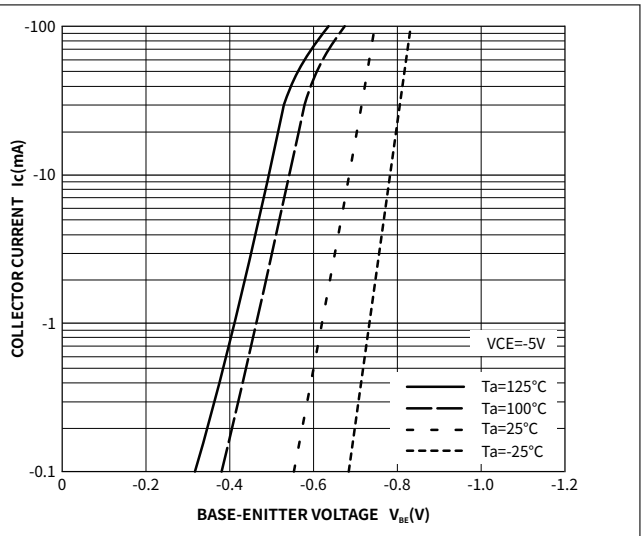



Fig.5 Base-Emitter On Voltage

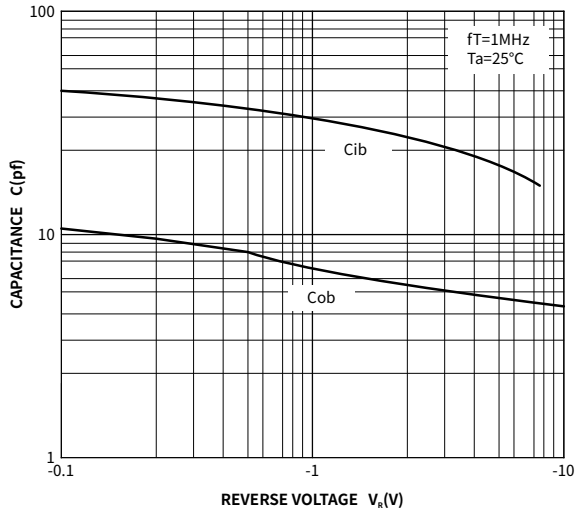
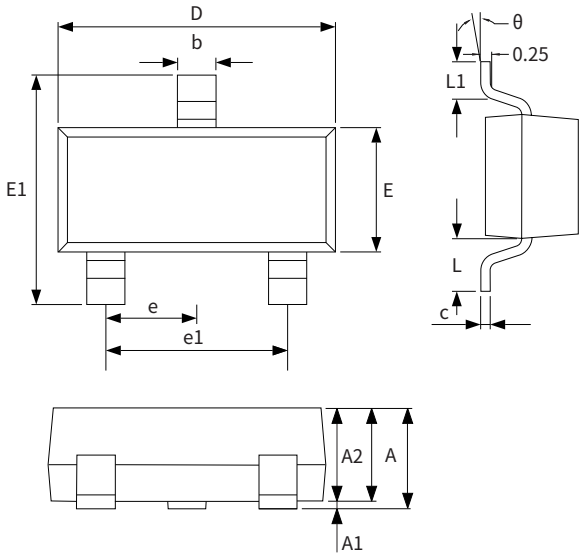


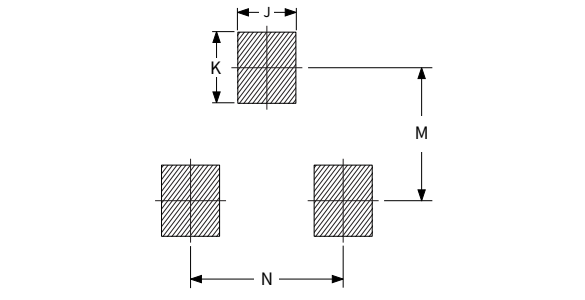

Fig.6 Cob/Cib-$V_{CB}V_{EB}$

## Package Outline Dimensions (SOT-23)




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 0.90 | 1.15 | 0.035 | 0.045 |
| A1 | - | 0.10 | - | 0.004 |
| A2 | 0.90 | 1.05 | 0.035 | 0.041 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.20 | 1.40 | 0.047 | 0.055 |
| E1 | 2.25 | 2.55 | 0.089 | 0.100 |
| e | 0.950TYP | | 0.037TYP | |
| e1 | 1.80 | 2.00 | 0.071 | 0.079 |
| L | 0.550REF | | 0.022REF | |
| L1 | 0.30 | 0.50 | 0.012 | 0.020 |
| θ | - | 8° | - | 8° |

## Suggested Pad Layout




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| J | 0.75 | 0.85 | 0.030 | 0.033 |
| K | 0.85 | 0.95 | 0.033 | 0.037 |
| M | 1.95 | 2.05 | 0.077 | 0.081 |
| N | 1.85 | 1.95 | 0.073 | 0.077 |