优尚

YOUSHANG SEMICONDUCTOR

# 设计研发新型功率器件

## 各类小信号开关

## 中低压及高压大电流等场效应管

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## Features

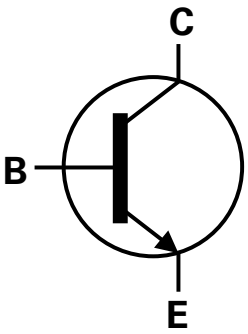
- $BV_{CEO}$ > 300V
- $I_C$ = 500mA High Continuous Current

## Mechanical Data

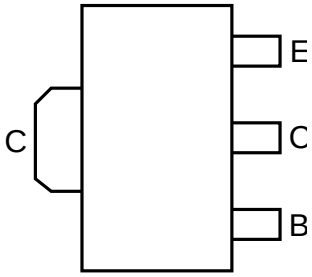
- Package: SOT89
- Package Material: Molded Plastic, “Green” Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.052 grams (Approximate)

SOT89

Top View




Device Symbol




Top View
Pinout

## Absolute Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 300 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 300 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 7 | V |
| Continuous Collector Current | $I_C$ | 500 | mA |

## Thermal Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

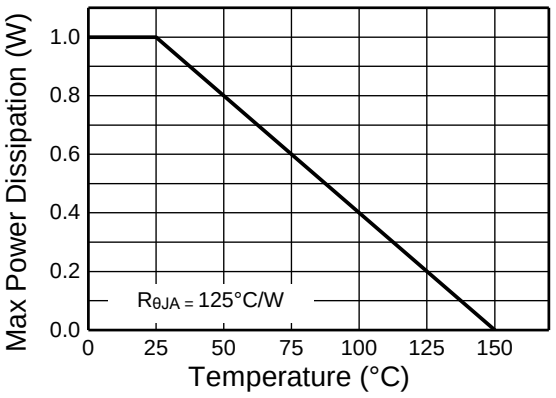
| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Collector Power Dissipation | $P_D$ | 1 | W |
| Thermal Resistance, Junction to Ambient Air (Note 6) | $R_{\theta JA}$ | 125 | °C/W |
| Operating and Storage Temperature Range | $T_J$,$T_{STG}$ | -65 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

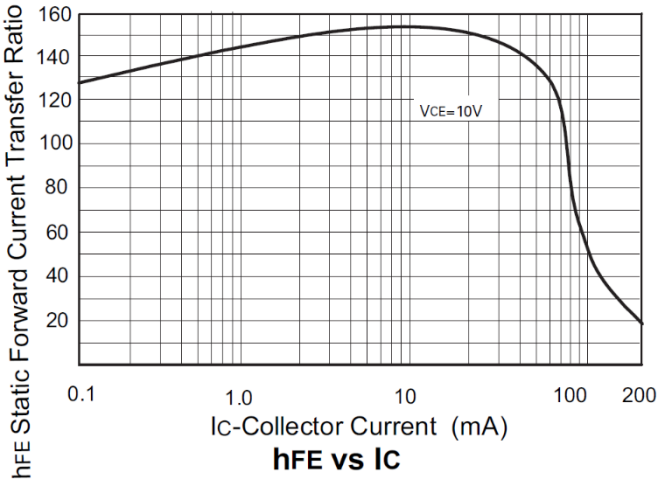
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $BV_{CBO}$ | 300 | — | — | V | $I_C$ = 100μA |
| Collector-Emitter Breakdown Voltage (Note 7) | $BV_{CEO}$ | 300 | — | — | V | $I_C$ = 1mA |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | 7 | — | — | V | $I_E$ = 100μA |
| Collector Cut-Off Current | $I_{CBO}$ | — | — | 0.1 | μA | $V_{CB}$ = 200V |
| Emitter Cut-Off Current | $I_{EBO}$ | — | — | 0.1 | μA | $V_{EB}$ = 6V |
| DC Current Transfer Static Ratio (Note 7) | $h_{FE}$ | 25<br>40<br>40 | —<br>—<br>— | —<br>—<br>— | —<br>—<br>— | $I_C$ = 1mA, $V_{CE}$ = 10V<br>$I_C$ = 10mA, $V_{CE}$ = 10V<br>$I_C$ = 30mA, $V_{CE}$ = 10V |
| Collector-Emitter Saturation Voltage (Note 7) | $V_{CE(sat)}$ | — | — | 0.5 | V | $I_C$ = 20mA, $I_B$ = 2mA |
| Base-Emitter Saturation Voltage (Note 7) | $V_{BE(sat)}$ | — | — | 0.9 | V | $I_C$ = 20mA, $I_B$ = 2mA |
| Transitional Frequency | $f_T$ | 50 | — | — | MHz | $I_C$ = 10mA, $V_{CE}$ = 20V<br>f = 20MHz |
| Output Capacitance | $C_{obo}$ | — | — | 6 | pF | $V_{CB}$ = 20V, f = 1MHz |

Note: 6. For the device mounted on 15mm x 15mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

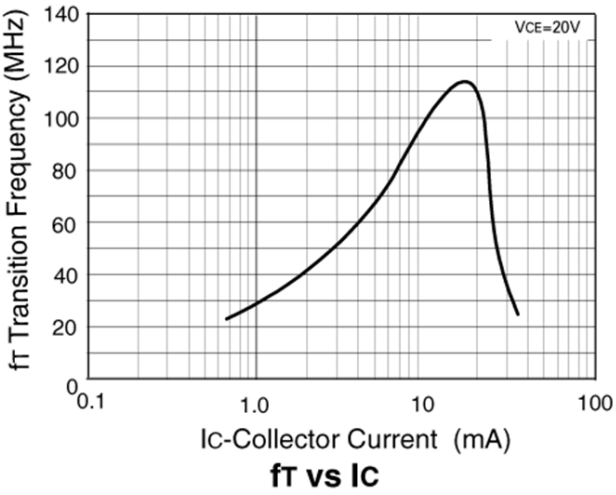
## Typical Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)



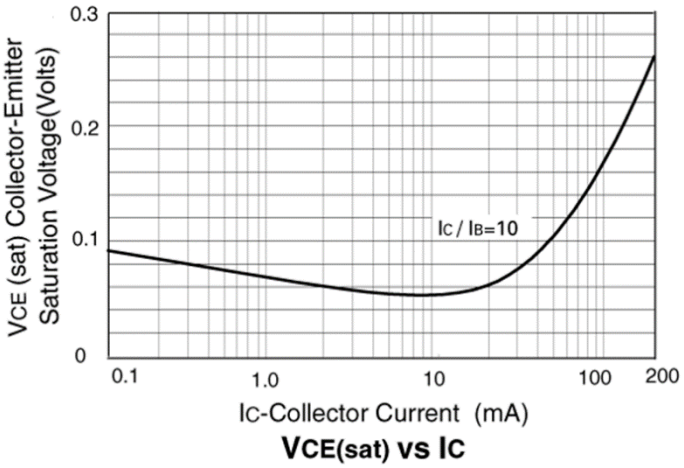

**Derating Curve**




**hFE vs IC**



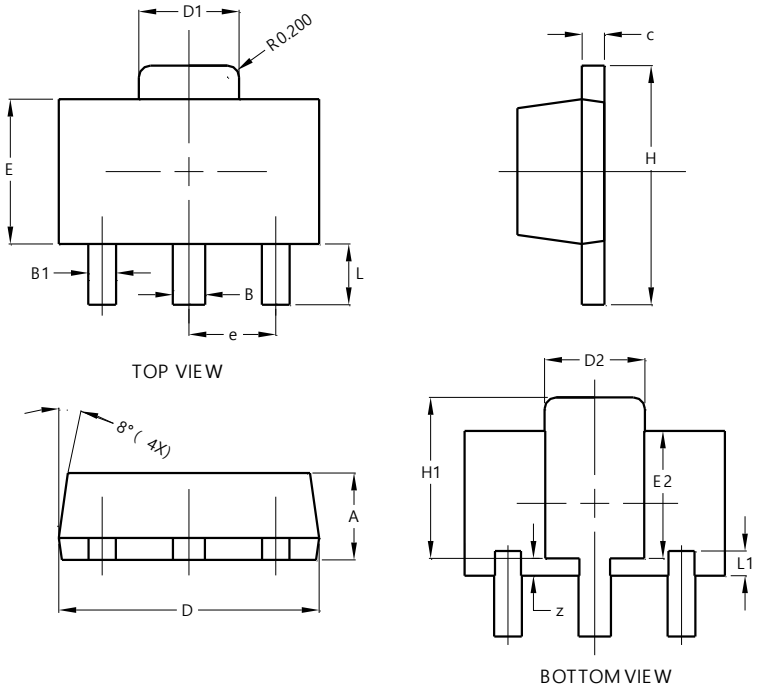

**fT vs IC**




**VCE(sat) vs IC**

## Package Outline Dimensions

**SOT89**




| SOT89 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 1.40 | 1.60 | 1.50 |
| **B** | 0.50 | 0.62 | 0.56 |
| **B1** | 0.42 | 0.54 | 0.48 |
| **c** | 0.35 | 0.43 | 0.38 |
| **D** | 4.40 | 4.60 | 4.50 |
| **D1** | 1.62 | 1.83 | 1.733 |
| **D2** | 1.61 | 1.81 | 1.71 |
| **E** | 2.40 | 2.60 | 2.50 |
| **E2** | 2.05 | 2.35 | 2.20 |
| **e** | - | - | 1.50 |
| **H** | 3.95 | 4.25 | 4.10 |
| **H1** | 2.63 | 2.93 | 2.78 |
| **L** | 0.90 | 1.20 | 1.05 |
| **L1** | 0.327 | 0.527 | 0.427 |
| **z** | 0.20 | 0.40 | 0.30 |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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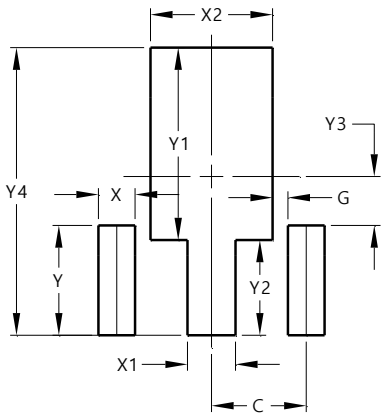
**SOT89**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 1.500 |
| **G** | 0.244 |
| **X** | 0.580 |
| **X1** | 0.760 |
| **X2** | 1.933 |
| **Y** | 1.730 |
| **Y1** | 3.030 |
| **Y2** | 1.500 |
| **Y3** | 0.770 |
| **Y4** | 4.530 |

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.