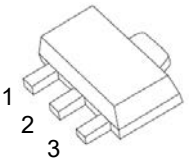
## 2SA1013 TRANSISTOR (PNP)

**SOT-89-3L**

1. BASE
2. COLLECTOR
3. EMITTER




### FEATURE

- **High voltage**
- **Large continuous collector current capability**

### MAXIMUM RATINGS ($T_a$=25℃ unless otherwise noted )

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | -160 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | -160 | V |
| $V_{EBO}$ | Emitter-Base Voltage | -6 | V |
| $I_C$ | Collector Current -Continuous | -1 | A |
| $P_C$ | Collector Power Dissipation | 0.5 | W |
| $T_J$,$T_{stg}$ | Operation Junction and Storage Temperature Range | -55~+150 | ℃ |
| $R_{\theta JA}$ | Thermal Resistance from Junction to Ambient | 250 | ℃/W |

### ELECTRICAL CHARACTERISTICS ($T_a$=25℃ unless otherwise specified)

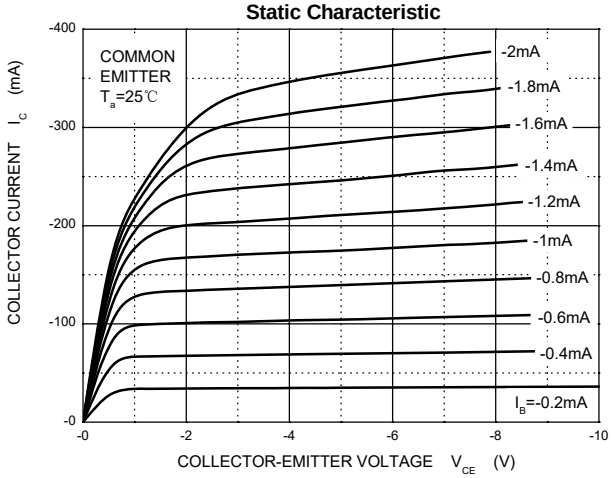
| Parameter | Symbol | Test conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| **Collector-base breakdown voltage** | $V_{(BR)CBO}$ | $I_C$=- 100μA , $I_E$=0 | -160 | | V |
| **Collector-emitter breakdown voltage** | $V_{(BR)CEO}$ | $I_C$= -1mA , $I_B$=0 | -160 | | V |
| **Emitter-base breakdown voltage** | $V_{(BR)EBO}$ | $I_E$= -10μA, $I_C$=0 | -6 | | V |
| **Collector cut-off current** | $I_{CBO}$ | $V_{CB}$=-150 V , $I_E$=0 | | -1 | μA |
| **Emitter cut-off current** | $I_{EBO}$ | $V_{EB}$=-6V, $I_C$=0 | | -1 | μA |
| **DC current gain** | $h_{FE}$ | $V_{CE}$=-5 V, $I_C$=- 200mA | 60 | 320 | |
| **Collector-emitter saturation voltage** | $V_{CE(sat)}$ | $I_C$= -500m A, $I_B$= -50mA | | -1.5 | V |
| **Base-emitter voltage** | $V_{BE}$ | $I_C$= -5 mA, $V_{CE}$=- 5V | | -0.75 | V |
| **Transition frequency** | $f_T$ | $V_{CE}$= -5 V, $I_C$= -200mA | 15 | | MHz |

### CLASSIFICATION OF $h_{FE}$

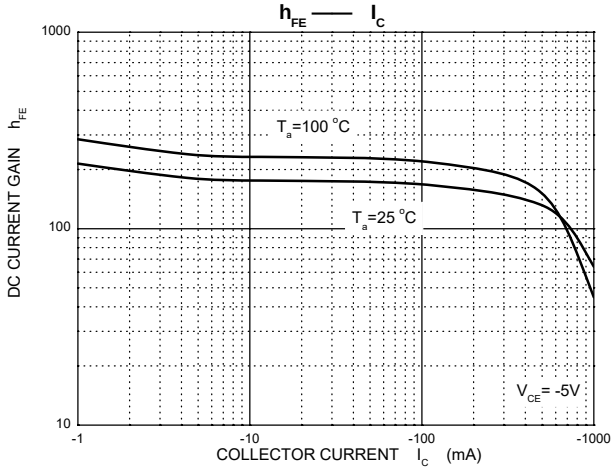
| **Rank** | R | O | Y |
|---|---|---|---|
| **Range** | 60-120 | 100-200 | 160-320 |

## Typical Characteristics

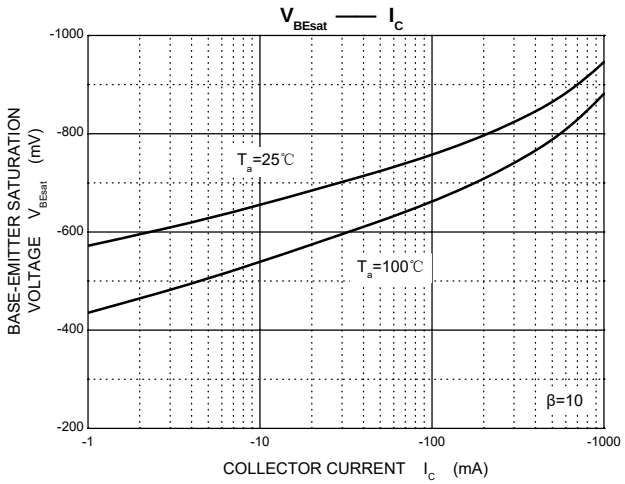
Static Characteristic



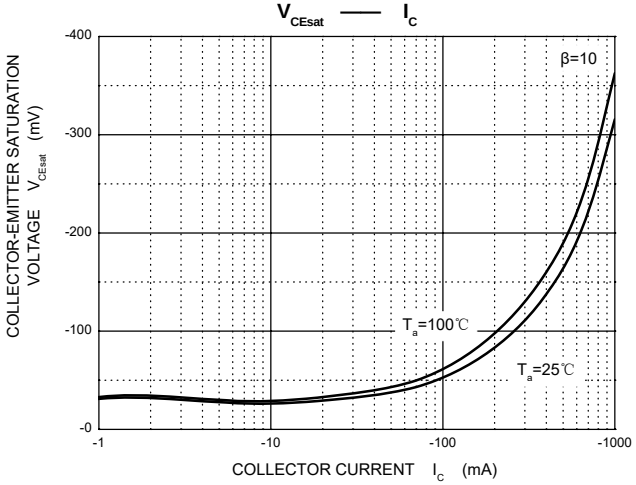

$h_{FE}$ — $I_C$



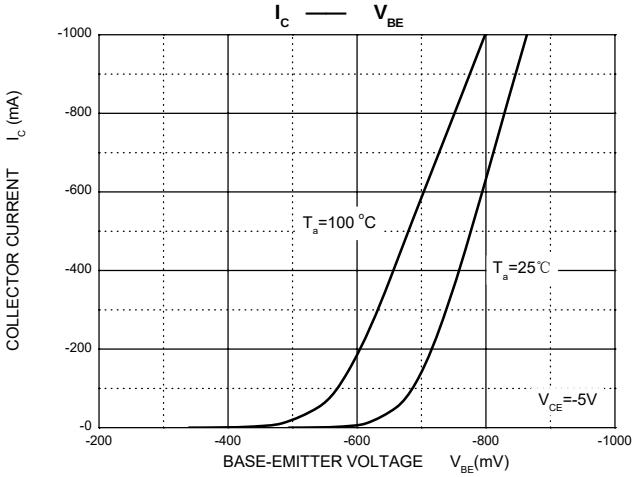

$V_{BEsat}$ — $I_C$



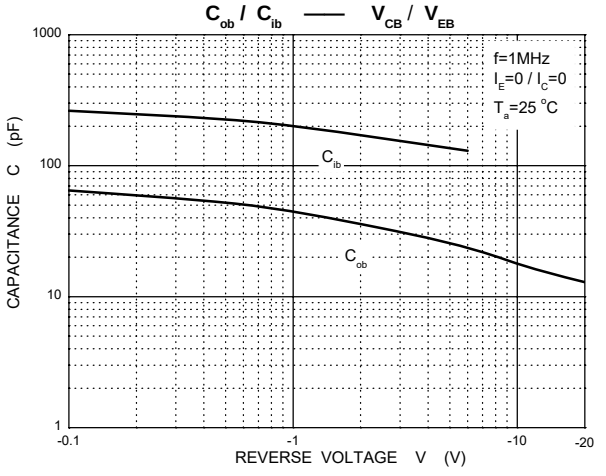

$V_{CEsat}$ — $I_C$



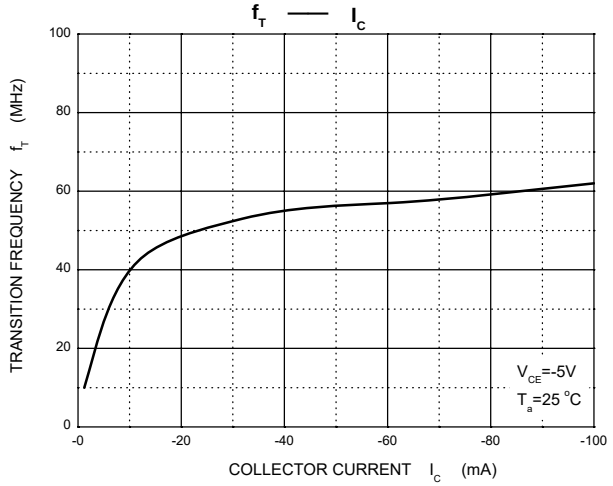

$I_C$ — $V_{BE}$



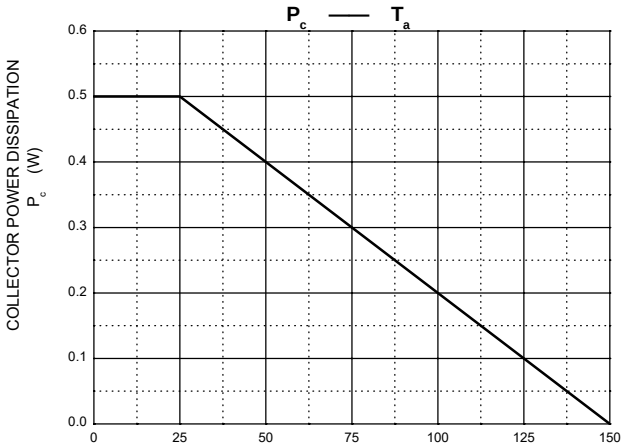

$C_{ob}$ / $C_{ib}$ — $V_{CB}$ / $V_{EB}$



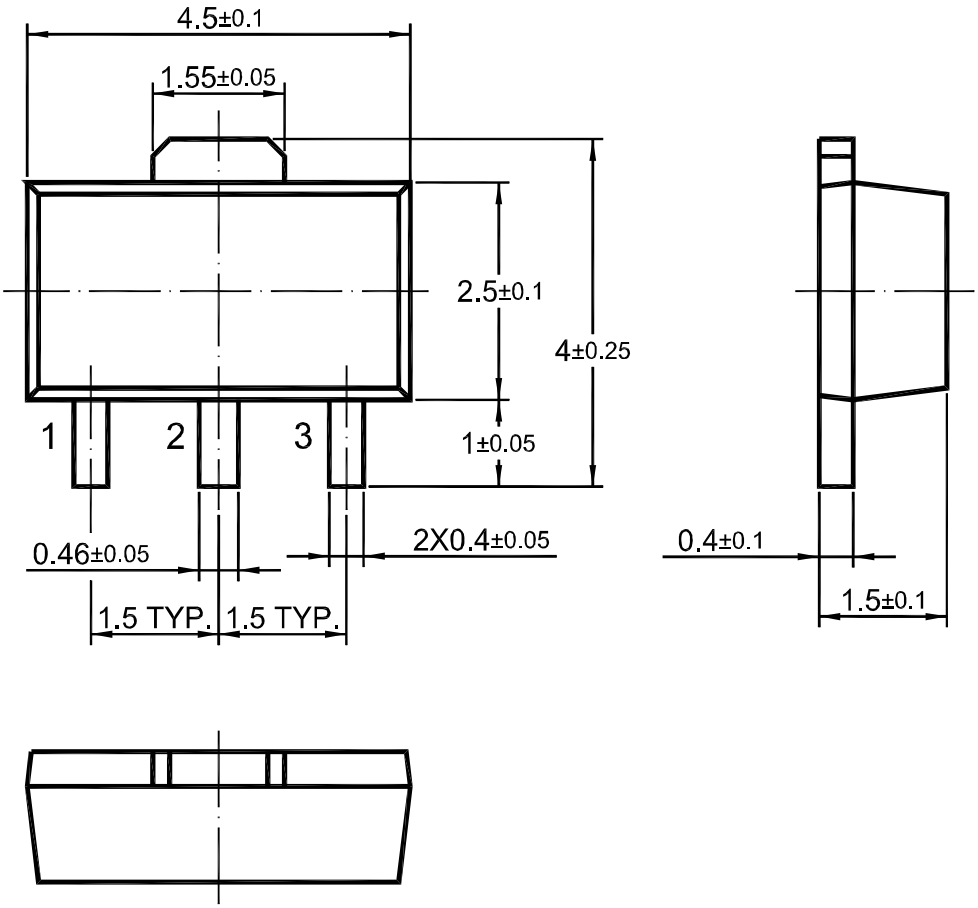

$f_T$ — $I_C$




$P_c$ — $T_a$



## SOT-89 PACKAGE OUTLINE




Dimensions in mm