

## SOT-23 Plastic-Encapsulate Transistor (PNP)

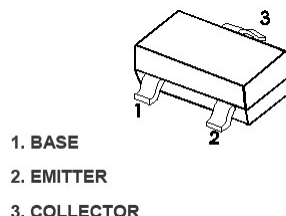
### Feature

- Complementary to MMBTA44
- Power Dissipation of 350mW
- High Stability and High Reliability

### Mechanical Data

- SOT-23 Small Outline Plastic Package
- Epoxy UL: 94V-0
- Mounting Position: Any

SOT-23



Marking: 4D

### Maximum Ratings & Thermal Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted )

| Parameter                                   | Symbol          | Value    | Unit                 |
|---------------------------------------------|-----------------|----------|----------------------|
| Collector-Base Voltage                      | $V_{CBO}$       | -400     | V                    |
| Collector-Emitter Voltage                   | $V_{CEO}$       | -400     | V                    |
| Emitter -Base Voltage                       | $V_{EBO}$       | -5       | V                    |
| Collector Current-Continuous                | $I_C$           | -200     | mA                   |
| Collector Power Dissipation                 | $P_C$           | 350      | mW                   |
| Junction Temperature                        | $T_j$           | 150      | $^{\circ}\text{C}$   |
| Storage Temperature                         | $T_{stg}$       | -55-+150 | $^{\circ}\text{C}$   |
| Thermal resistance From junction to ambient | $R_{\theta JA}$ | 357      | $^{\circ}\text{C/W}$ |

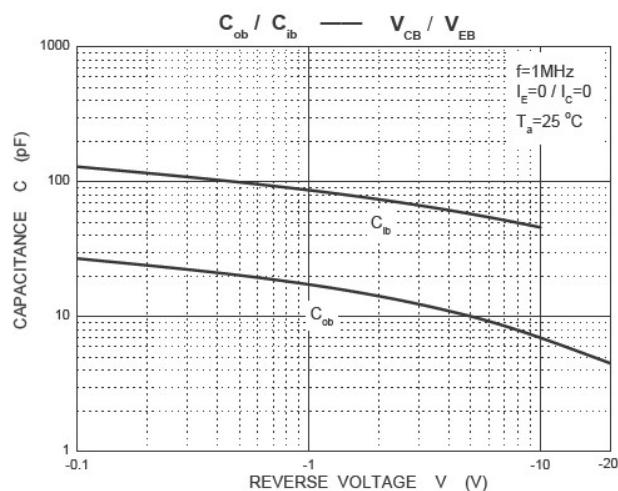
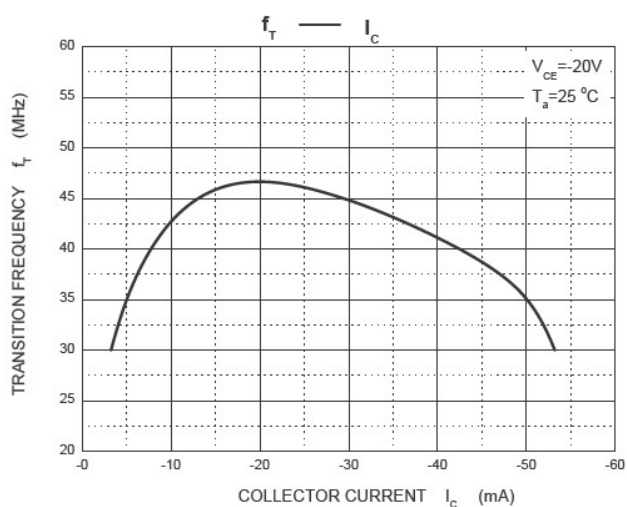
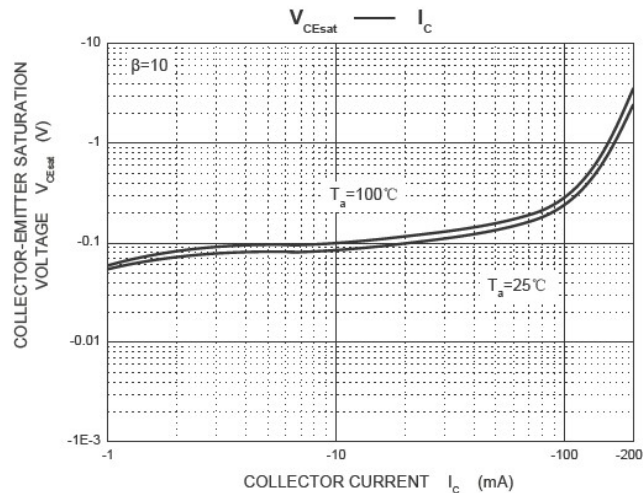
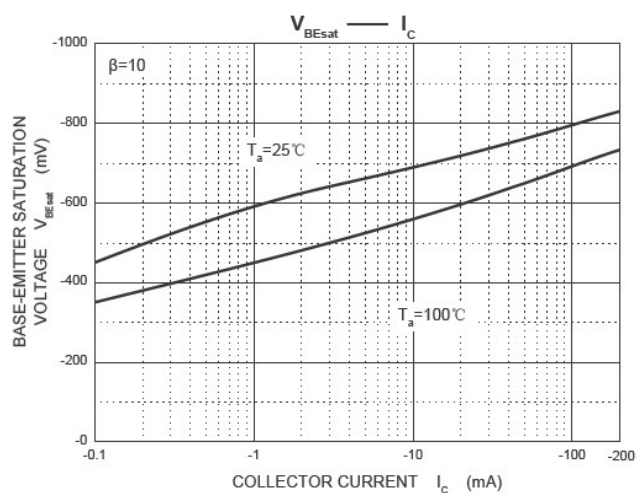
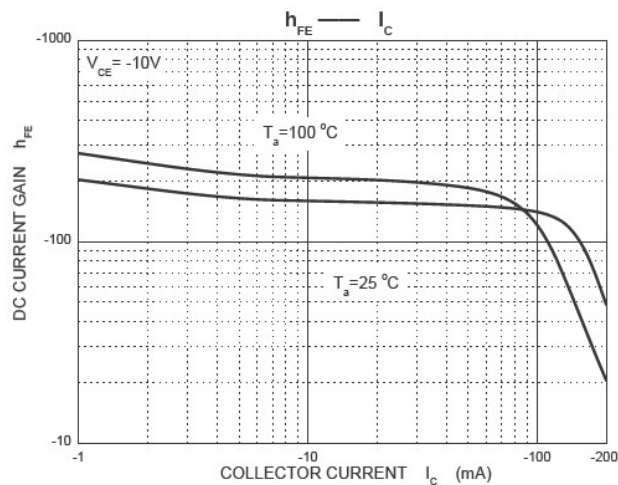
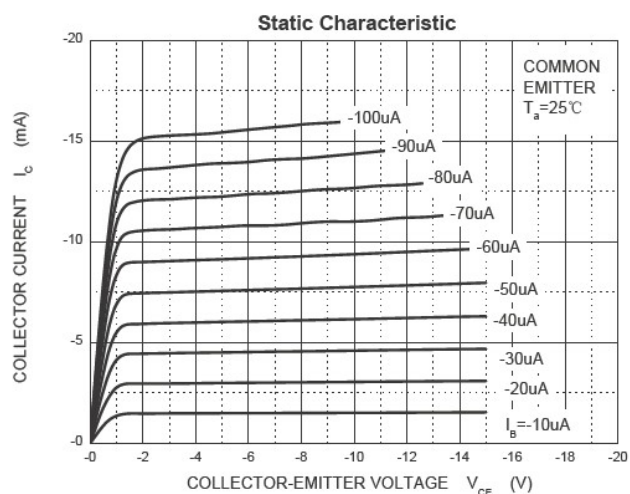
### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

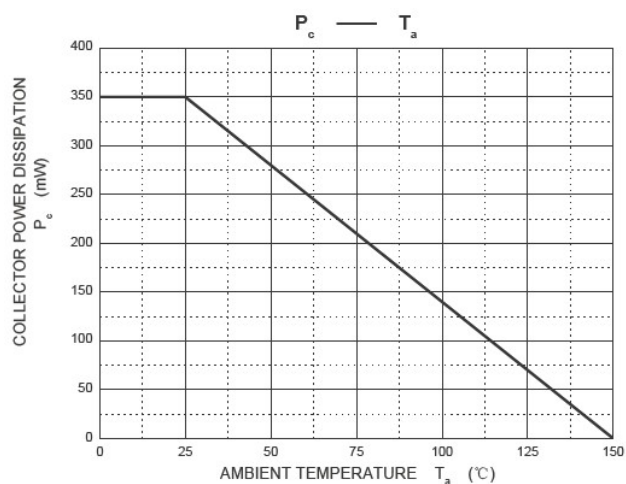
| Parameter                            | Symbol          | Test Condition                                        | Limit |       | Unit          |
|--------------------------------------|-----------------|-------------------------------------------------------|-------|-------|---------------|
|                                      |                 |                                                       | Min   | Max   |               |
| Collector-base breakdown voltage     | $V_{(BR)CBO}$   | $I_C=-100\mu\text{A}, I_E=0$                          | -400  |       | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}^*$ | $I_C=-1\text{mA}, I_B=0$                              | -400  |       | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$   | $I_E=-100\mu\text{A}, I_C=0$                          | -5    |       | V             |
| Collector cut-off current            | $I_{CBO}$       | $V_{CB}=-400\text{V}, I_E=0$                          |       | -100  | nA            |
| Collector cut-off current            | $I_{CEO}$       | $V_{CE}=-400\text{V}, I_E=0$                          |       | -5    | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$       | $V_{EB}=-4\text{V}, I_C=0$                            |       | -100  | nA            |
| DC current gain                      | $h_{FE(1)}^*$   | $V_{CE}=-10\text{V}, I_C=-10\text{mA}$                | 80    | 300   |               |
|                                      | $h_{FE(2)}^*$   | $V_{CE}=-10\text{V}, I_C=-1\text{mA}$                 | 70    |       |               |
|                                      | $h_{FE(3)}^*$   | $V_{CE}=-10\text{V}, I_C=-50\text{mA}$                | 40    |       |               |
|                                      | $h_{FE(4)}^*$   | $V_{CE}=-10\text{V}, I_C=-100\text{mA}$               | 40    |       |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}^*$ | $I_C=-10\text{mA}, I_B=-1\text{mA}$                   |       | -0.20 | V             |
|                                      | $V_{CE(sat)}^*$ | $I_C=-50\text{mA}, I_B=-5\text{mA}$                   |       | -0.30 | V             |
| Base -emitter saturation voltage     | $V_{BE(sat)}^*$ | $I_C=-10\text{mA}, I_B=-1\text{mA}$                   |       | -0.75 | V             |
| Transition frequency                 | $f_T$           | $V_{CE}=-20\text{V}, I_C=10\text{mA}, f=30\text{MHz}$ | 50    |       | MHz           |

\*Pulse test: pulse width $\leq 300\mu\text{s}$ , duty cycle $\leq 2.0\%$

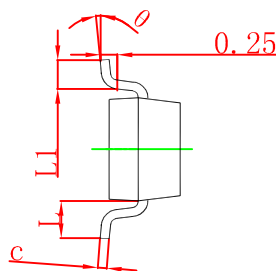
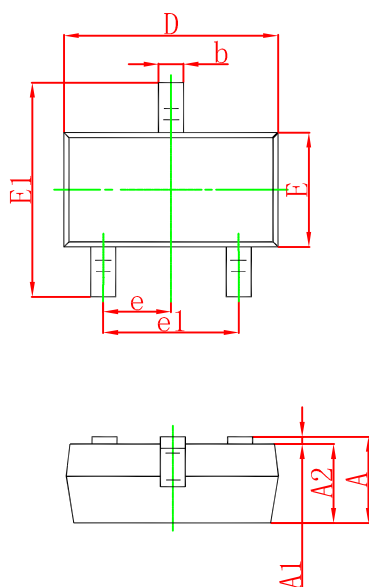


Typical Characteristics



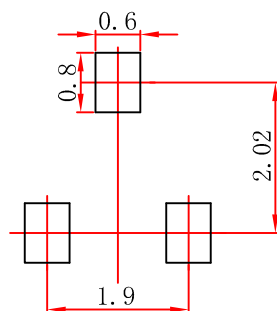


## SOT-23 Package Dimension



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23 Suggested Pad Layout



### Notes:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.