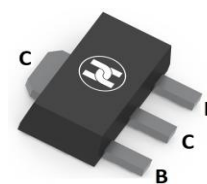
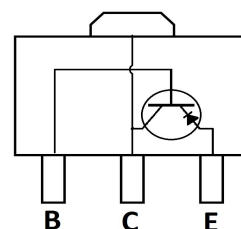


**BIPOLAR TRANSISTOR (PNP)**
**FEATURES**

- Complementary to PXT3904
- Low Voltage and Low Current
- Surface Mount device

**Marking: 2A**
**MECHANICAL DATA**

- Case: SOT-89
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.055 grams (approximate)


**SOT-89**

**MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  unless otherwise noted)**

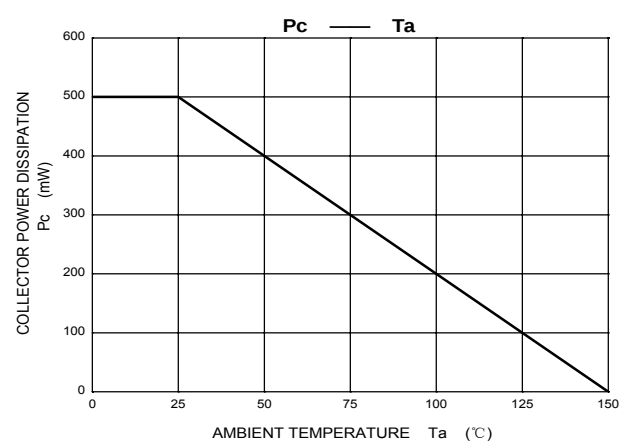
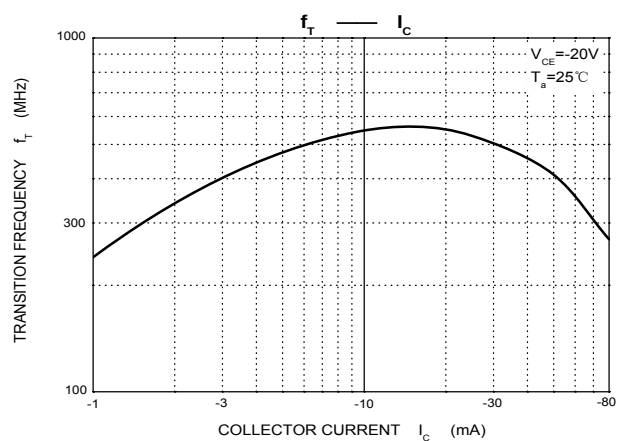
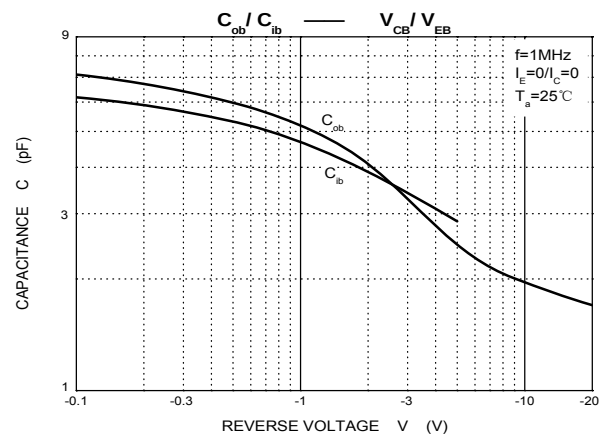
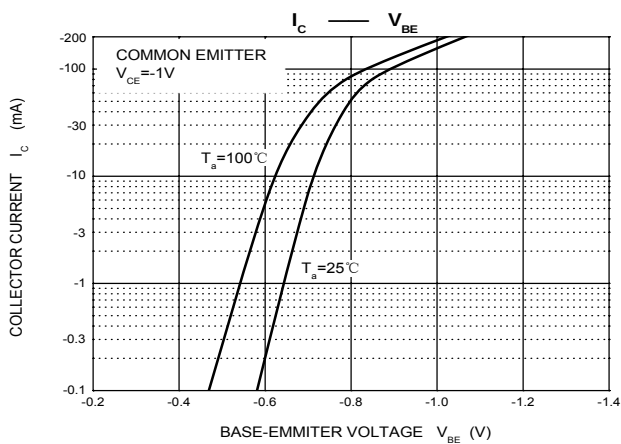
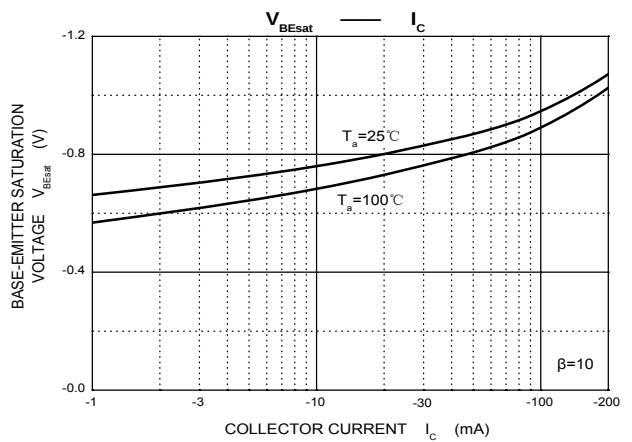
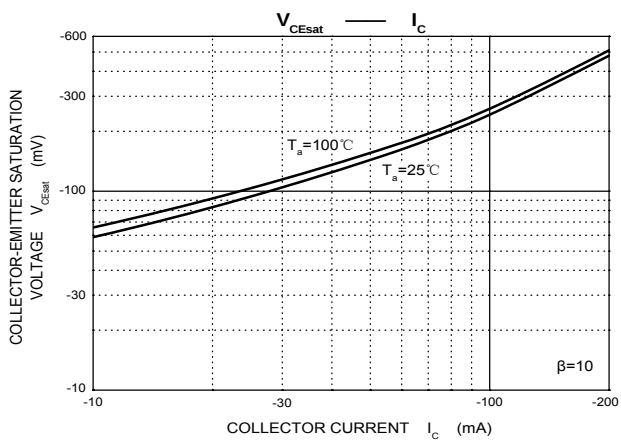
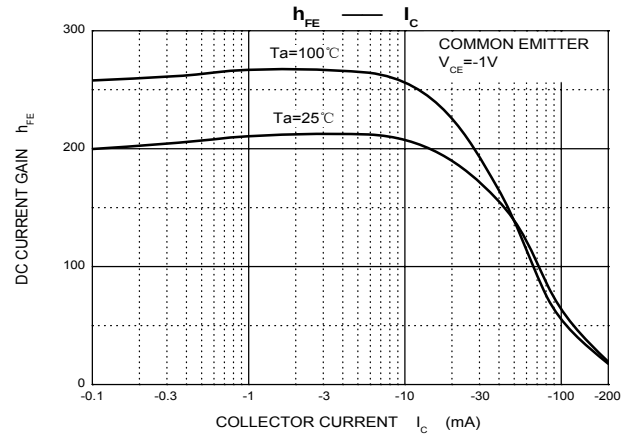
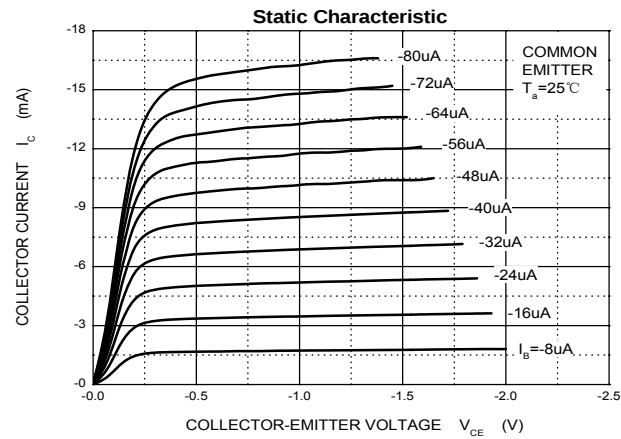
| Parameter                                   | Symbol          | Value      | Unit               |
|---------------------------------------------|-----------------|------------|--------------------|
| Collector-Base Voltage                      | $V_{CBO}$       | -40        | V                  |
| Collector-Emitter Voltage                   | $V_{CEO}$       | -40        | V                  |
| Emitter-Base Voltage                        | $V_{EBO}$       | -6         | V                  |
| Collector Current                           | $I_C$           | -200       | mA                 |
| Collector Power Dissipation                 | $P_C$           | 500        | mW                 |
| Thermal Resistance From Junction To Ambient | $R_{\theta JA}$ | 250        | $^\circ\text{C/W}$ |
| Junction Temperature                        | $T_J$           | 150        | $^\circ\text{C}$   |
| Storage Temperature                         | $T_{STG}$       | -55 ~ +150 | $^\circ\text{C}$   |

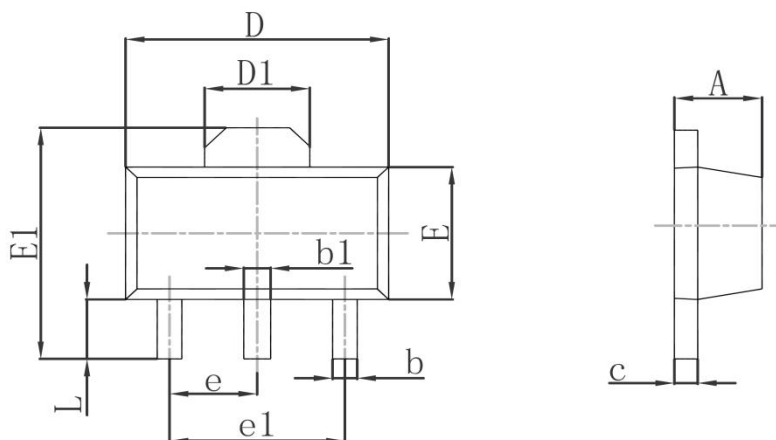
**ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise specified)**

| Parameter                            | Symbol        | Min | Typ | Max   | Unit          | Conditions                                                                                                   |
|--------------------------------------|---------------|-----|-----|-------|---------------|--------------------------------------------------------------------------------------------------------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | -40 |     |       | V             | $I_C = -10\mu\text{A}$ , $I_E = 0$                                                                           |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | -40 |     |       | V             | $I_C = -1\text{mA}$ , $I_B = 0$                                                                              |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | -6  |     |       | V             | $I_E = -10\mu\text{A}$ , $I_C = 0$                                                                           |
| Collector cut-off current            | $I_{CBO}$     |     |     | -0.05 | $\mu\text{A}$ | $V_{CB} = -30\text{V}$ , $I_E = 0$                                                                           |
| Collector cut-off current            | $I_{CEX}$     |     |     | -0.05 | $\mu\text{A}$ | $V_{CB} = -30\text{V}$ , $V_{BE(OFF)} = -3\text{V}$                                                          |
| Emitter cut-off current              | $I_{EBO}$     |     |     | -0.05 | $\mu\text{A}$ | $V_{EB} = -6\text{V}$ , $I_C = 0$                                                                            |
| DC current gain                      | $h_{FE}$      | 60  |     |       |               | $V_{CE} = -1\text{V}$ , $I_C = -0.1\text{mA}$                                                                |
|                                      |               | 80  |     |       |               | $V_{CE} = -1\text{V}$ , $I_C = -1\text{mA}$                                                                  |
|                                      |               | 100 | 300 |       |               | $V_{CE} = -1\text{V}$ , $I_C = -10\text{mA}$                                                                 |
|                                      |               | 60  |     |       |               | $V_{CE} = -1\text{V}$ , $I_C = -50\text{mA}$                                                                 |
|                                      |               | 30  |     |       |               | $V_{CE} = -1\text{V}$ , $I_C = -100\text{mA}$                                                                |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ |     |     | -0.25 | V             | $I_C = -10\text{mA}$ , $I_B = -1\text{mA}$                                                                   |
|                                      |               |     |     | -0.4  | V             | $I_C = -50\text{mA}$ , $I_B = -5\text{mA}$                                                                   |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ |     |     | -0.85 | V             | $I_C = -10\text{mA}$ , $I_B = -1\text{mA}$                                                                   |
|                                      |               |     |     | -0.95 | V             | $I_C = -50\text{mA}$ , $I_B = -5\text{mA}$                                                                   |
| Delay time                           | $t_d$         |     |     | 12    | nS            | $V_{CC} = -30\text{V}$ , $I_C = -150\text{mA}$ ,<br>$I_{B1} = -I_{B2} = -15\text{mA}$                        |
| Rise time                            | $t_r$         |     |     | 30    | nS            |                                                                                                              |
| Storage time                         | $t_s$         |     |     | 300   | nS            |                                                                                                              |
| Fall time                            | $t_f$         |     |     | 65    | nS            |                                                                                                              |
| Transition frequency                 | $f_T$         | 200 |     |       | MHz           | $V_{CE} = -20\text{V}$ , $I_C = -10\text{mA}$ , $f = 100\text{MHz}$                                          |
| Collector capacitance                | $C_c$         |     |     | 4.5   | pF            | $V_{CB} = -5\text{V}$ , $I_E = 0$ , $f = 1\text{MHz}$                                                        |
| Emitter capacitance                  | $C_e$         |     |     | 10    | pF            | $V_{EB} = -0.5\text{V}$ , $I_C = 0$ , $f = 1\text{MHz}$                                                      |
| Noise figure                         | NF            |     |     | 4     | dB            | $V_{CE} = -5\text{V}$ , $I_C = -0.1\text{mA}$ , $f = 10\text{Hz} - 15.7\text{KHz}$ , $R_S = 1\text{k}\Omega$ |

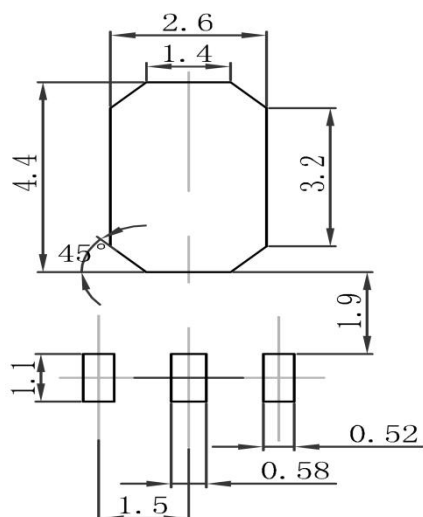
# BIPOLAR TRANSISTOR (PNP)

## Typical Characteristics



**BIPOLAR TRANSISTOR (PNP)**
**SOT-89 Package Outline Dimensions**


| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.320                     | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550REF                  |       | 0.061REF             |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500TYP                  |       | 0.060TYP             |       |
| e1     | 3.000TYP                  |       | 0.118TYP             |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |

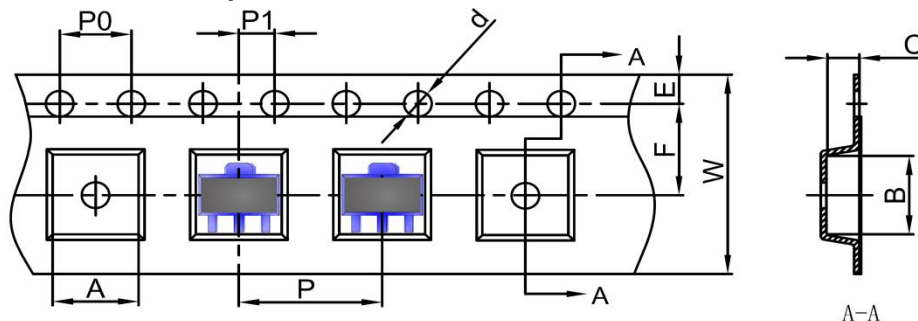
**SOT-89 Suggested Pad Layout**

**Note:**

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

## BIPOLAR TRANSISTOR (PNP)

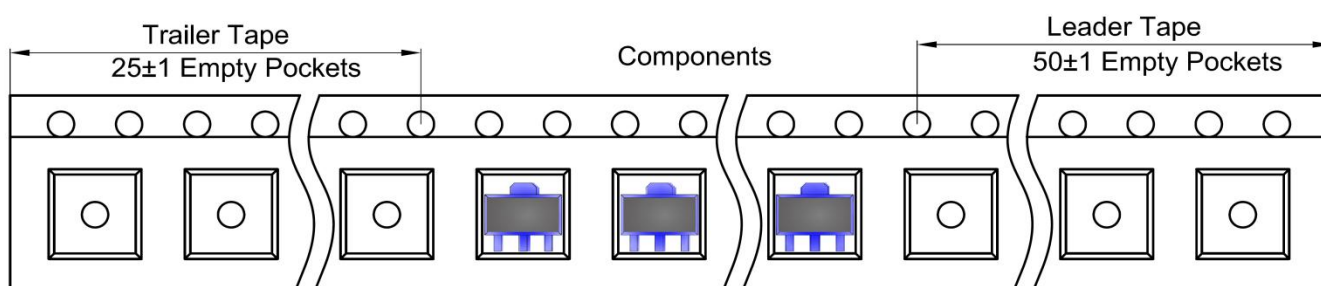
### SOT-89 Tape and Reel

#### SOT-89 Embossed Carrier Tape

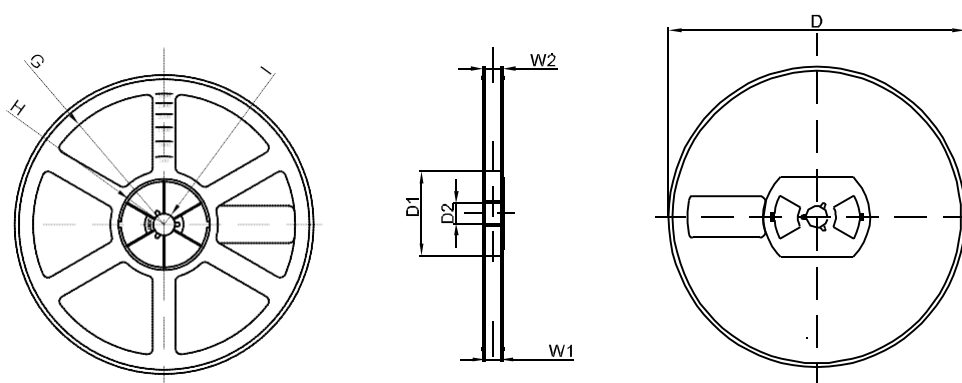


| DIMENSIONS ARE IN MILLIMETER |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| TYPE                         | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SOT-89                       | 4.85 | 4.45 | 1.85 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |
| TOLERANCE                    | ±0.1 | ±0.1 | ±0.1 | ±0.1  | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1  |

#### SOT-89 Tape Leader and Trailer



#### SOT-89 Reel



| DIMENSIONS ARE IN MILLIMETER |      |       |       |     |        |       |       |       |
|------------------------------|------|-------|-------|-----|--------|-------|-------|-------|
| REEL OPTION                  | D    | D1    | D2    | G   | H      | I     | W1    | W2    |
| 7" DIA                       | Ø178 | 54.40 | 13.00 | R78 | R25.60 | R6.50 | 13.20 | 16.50 |
| TOLERANCE                    | ±2   | ±1    | ±1    | ±1  | ±1     | ±1    | ±1    | ±1    |