

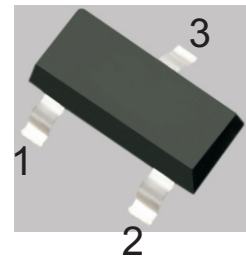


MMBT3904
NPN TRANSISTOR

FEATURES

- Complementary to MMBT3906

SOT-23



1.BASE
2.EMITTER
3.COLLECTOR

MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|----------------|----------|------|
| Collector-Base Voltage | V_{CB0} | 60 | V |
| Collector-Emitter Voltage | V_{CEO} | 40 | V |
| Emitter-Base Voltage | V_{EBO} | 6 | V |
| Collector Current — Continuous | I_C | 200 | mA |
| Collector Power Dissipation | P_C | 200 | mW |
| Thermal Resistance From Junction To Ambient | R_{thJA} | 625 | °C/W |
| Operation Junction and Storage Temperature Range | T_J, T_{stg} | -55~+150 | °C |

CLASSIFICATION OF h_{FE}

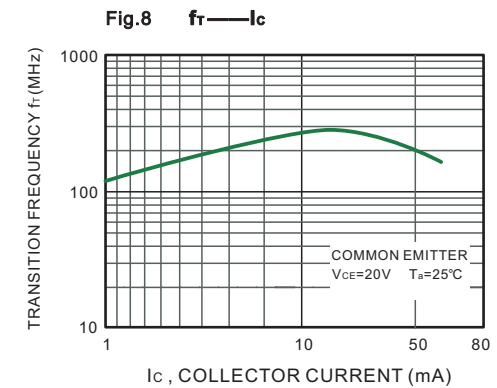
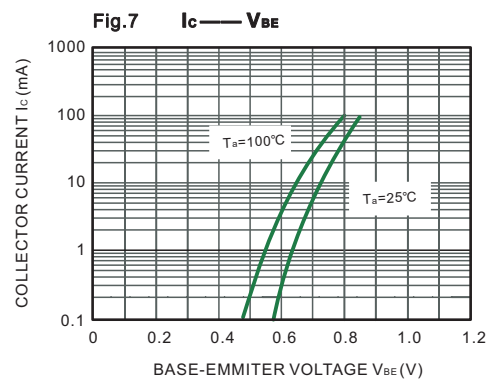
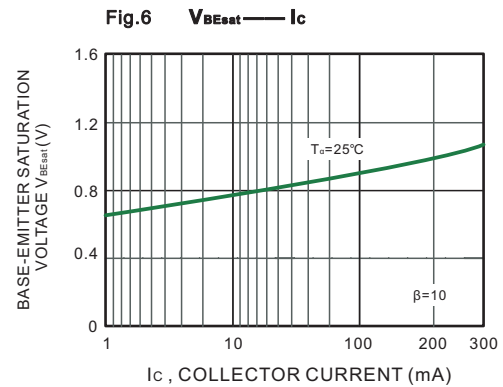
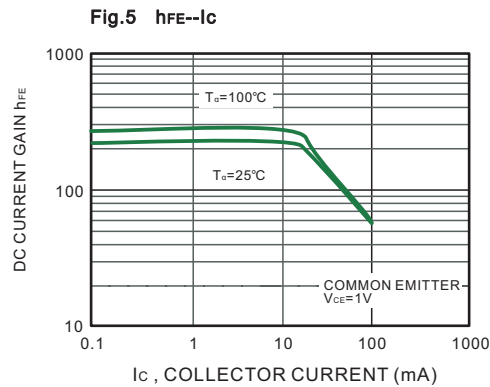
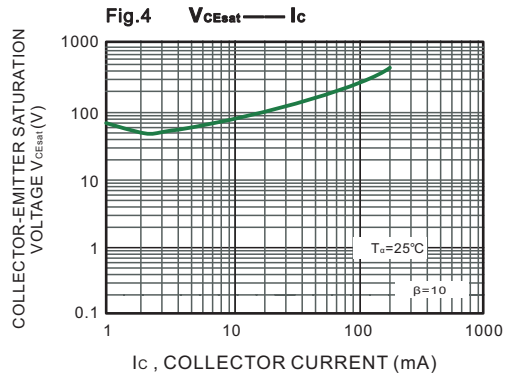
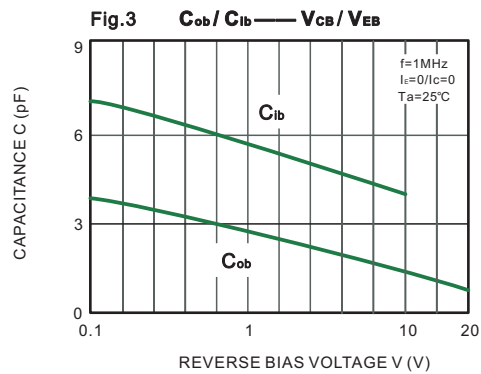
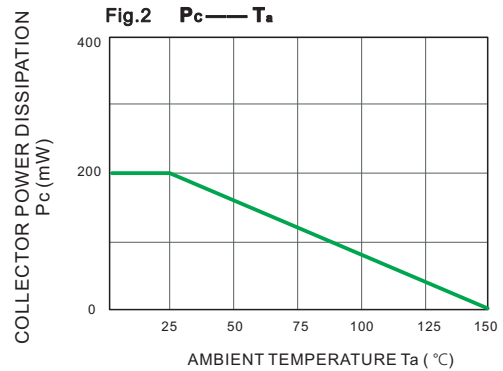
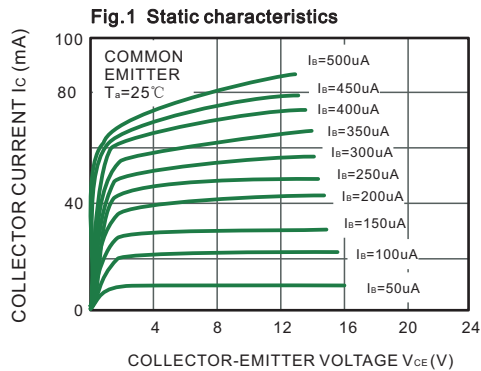
| | | |
|-------|---------|---------|
| HFE | 100-300 | |
| Rank | L | H |
| Range | 100-200 | 200-300 |

ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted.)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|--|-----|-----|------|------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C = 10\mu A, I_E = 0$ | 60 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C = 1\text{ mA}, I_B = 0$ | 40 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E = 10\mu A, I_C = 0$ | 6 | | | V |
| Collector cut-off current | I_{CEX} | $V_{CE} = 30V, V_{BE(off)} = 3V$ | | | 50 | nA |
| Collector cut-off current | I_{CBO} | $V_{CB} = 60V, I_E = 0$ | | | 100 | nA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 5V, I_C = 0$ | | | 100 | nA |
| DC current gain | h_{FE1} | $V_{CE} = 1V, I_C = 10\text{mA}$ | 100 | | 300 | |
| | h_{FE2} | $V_{CE} = 1V, I_C = 50\text{mA}$ | 60 | | | |
| | h_{FE3} | $V_{CE} = 1V, I_C = 100\text{mA}$ | 30 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 50\text{mA}, I_B = 5\text{mA}$ | | | 0.3 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C = 50\text{mA}, I_B = 5\text{mA}$ | | | 0.95 | V |
| Transition frequency | f_T | $V_{CE} = 20V, I_C = 10\text{mA}, f = 100\text{MHz}$ | 300 | | | MHZ |
| Delay time | t_d | $V_{CC} = 3V, V_{BE(off)} = -0.5V, I_C = 10\text{mA}, I_{B1} = 1\text{mA}$ | | | 35 | ns |
| Rise time | t_r | | | | 35 | ns |
| Storage time | t_s | $V_{CC} = 3V, I_C = 10\text{mA}, I_{B1} = I_{B2} = 1\text{mA}$ | | | 200 | ns |
| Fall time | t_f | | | | 50 | ns |

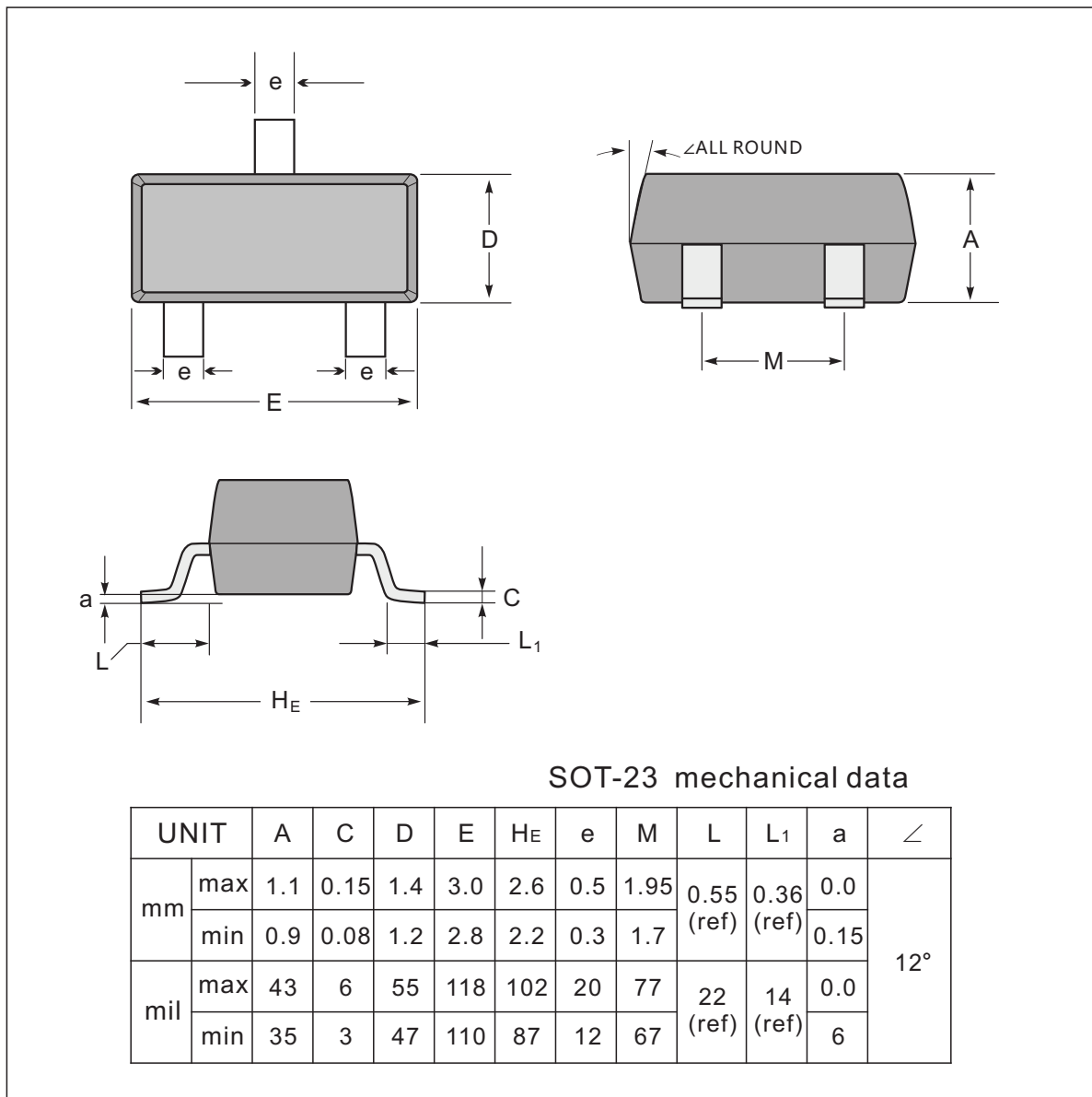


TYPICAL CHARACTERISTICS

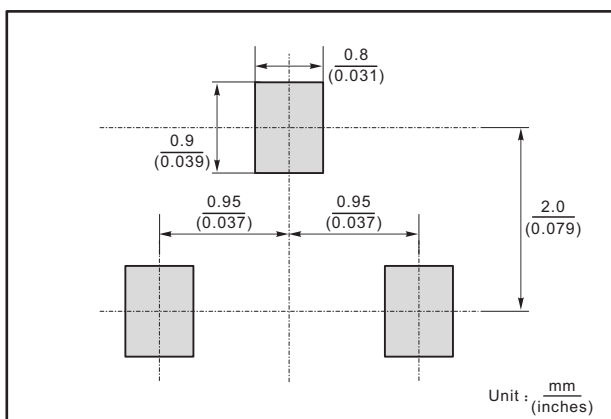




SOT-23 Package Outline Dimensions



The recommended mounting pad size



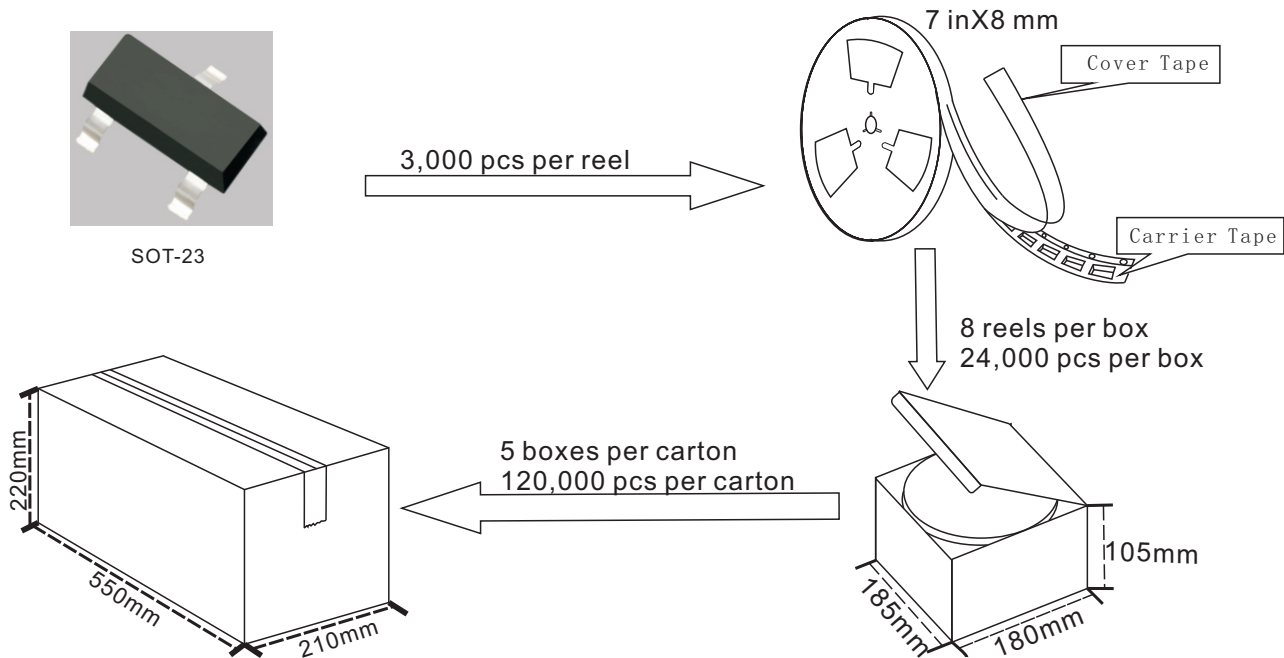
Marking

| Type number | Marking code |
|-------------|--------------|
| MMBT3904 | 1AM |

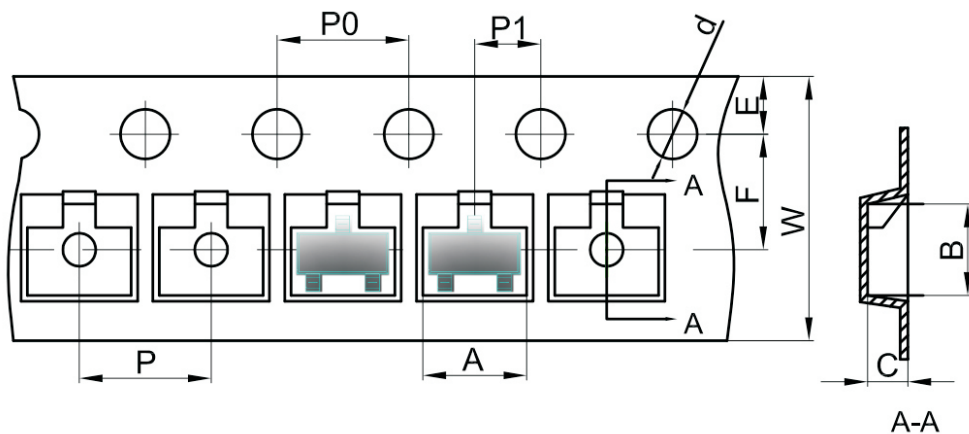


SOT-23 Packing

1. The method of packaging and dimension are shown as below figure. (Dimension in mm)



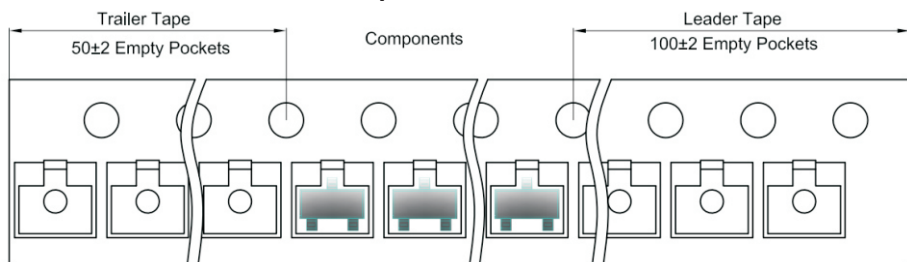
SOT-23 Embossed Carrier Tape



Dimensions are in millimeter

| Pkg type | A | B | C | d | E | F | P0 | P | P1 | W |
|----------|------|------|------|-------|------|------|------|------|------|------|
| SOT-23 | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

SOT-23 Tape Leader and Trailer



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