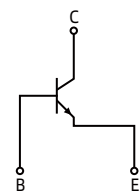


## Features

- Low current, Low voltage.
- General purpose amplifier and switching.
- Complementary to MMBT3906.



SOT23



Equivalent Circuit

## Absolute Maximum Ratings( $T_A=25^{\circ}\text{C}$ )

| Symbol          | Parameter                                        | Value      | Unit                 |
|-----------------|--------------------------------------------------|------------|----------------------|
| $V_{CBO}$       | Collector-Base Voltage                           | 60         | V                    |
| $V_{CEO}$       | Collector-Emitter Voltage                        | 40         | V                    |
| $V_{EBO}$       | Emitter-Base Voltage                             | 6          | V                    |
| $I_C$           | Collector Current                                | 0.2        | A                    |
| $P_C$           | Collector Power Dissipation                      | 200        | mW                   |
| $R_{\theta JA}$ | Thermal Resistance From Junction To Ambient      | 625        | $^{\circ}\text{C/W}$ |
| $T_J, T_{stg}$  | Operation Junction And Storage Temperature Range | -55 ~ +150 | $^{\circ}\text{C/W}$ |

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

| Symbol        | Parameter                            | Test conditions                                                                        | Min | Typ | Max  | Unit |
|---------------|--------------------------------------|----------------------------------------------------------------------------------------|-----|-----|------|------|
| $V_{(BR)CBO}$ | Collector-base breakdown voltage     | $I_C=10\mu\text{A}, I_E=0$                                                             | 60  |     |      | V    |
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage  | $I_C=1\text{mA}, I_B=0$                                                                | 40  |     |      | V    |
| $V_{(BR)EBO}$ | Emitter-base breakdown voltage       | $I_E=10\mu\text{A}, I_C=0$                                                             | 6   |     |      | V    |
| $I_{CEX}$     | Collector cut-off current            | $V_{CE}=20\text{V}, I_E=0$                                                             |     |     | 50   | nA   |
| $I_{CBO}$     | Collector cut-off current            | $V_{CB}=40\text{V}, I_E=0$                                                             |     |     | 100  | nA   |
| $I_{EBO}$     | Emitter cut-off current              | $V_{EB}=5\text{V}, I_C=0$                                                              |     |     | 100  | nA   |
| $h_{FE(1)}$   | DC current gain(1)                   | $V_{CE}=1\text{V}, I_C=10\text{mA}$                                                    | 100 |     | 300  |      |
| $h_{FE(2)}$   | DC current gain(2)                   | $V_{CE}=1\text{V}, I_C=50\text{mA}$                                                    | 60  |     |      |      |
| $h_{FE(3)}$   | DC current gain(3)                   | $V_{CE}=1\text{V}, I_C=100\text{mA}$                                                   | 30  |     | 300  |      |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_C=50\text{mA}, I_B=5\text{mA}$                                                      |     |     | 0.3  | V    |
| $V_{BE(sat)}$ | Base-emitter saturation voltage      |                                                                                        |     |     | 0.95 | V    |
| $f_T$         | Transition frequency                 | $V_{CE}=20\text{V}, I_C=10\text{mA}, f=100\text{MHz}$                                  | 300 |     |      | MHz  |
| $t_d$         | Delay time                           | $V_{CC}=3\text{V}, V_{BE(off)}=0.5\text{V}, I_C=10\text{mA}, I_{B1}=I_{B2}=1\text{mA}$ |     |     | 35   | ns   |
| $t_r$         | Rise time                            |                                                                                        |     |     | 35   | ns   |
| $t_s$         | Storage time                         | $V_{CC}=3\text{V}, I_C=10\text{mA}, I_{B1}=I_{B2}=1\text{mA}$                          |     |     | 200  | ns   |
| $t_f$         | Fall time                            |                                                                                        |     |     | 50   | ns   |

## Ordering information

| Product ID | Pack  | Naming rule                                                                                                                                                                 | Marking | $h_{FE(1)}$ | Qty(PCS) |
|------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------|----------|
| MMBT3904   | SOT23 | <div style="border: 1px solid black; padding: 5px; display: inline-block;">MMBT3904</div><br><div style="text-align: center; font-size: small;">产品名称<br/>product name</div> | 1AM     | 100 ~ 300   | 3000     |

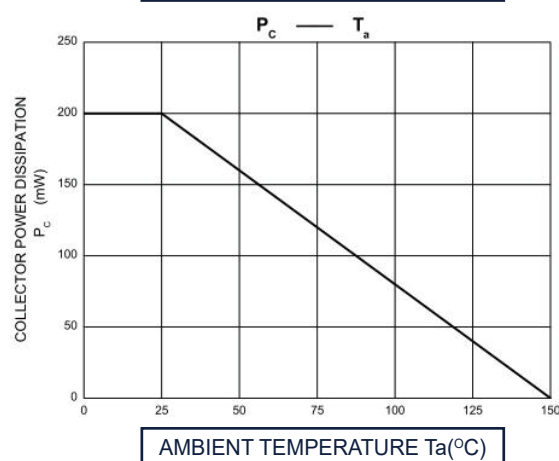
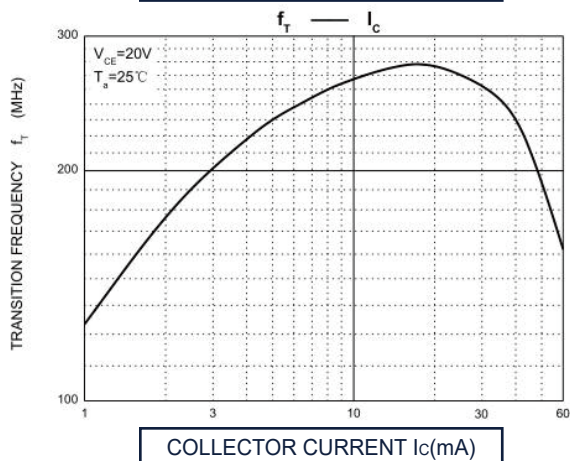
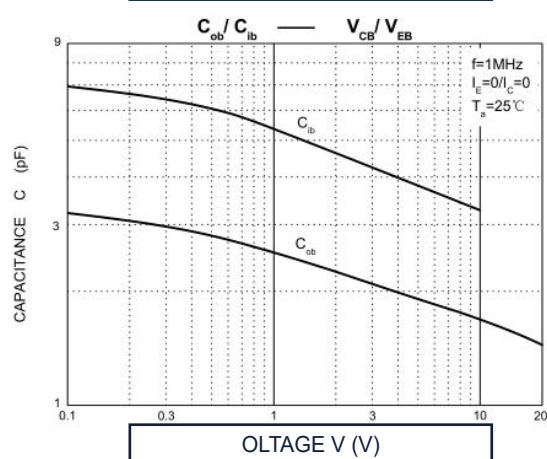
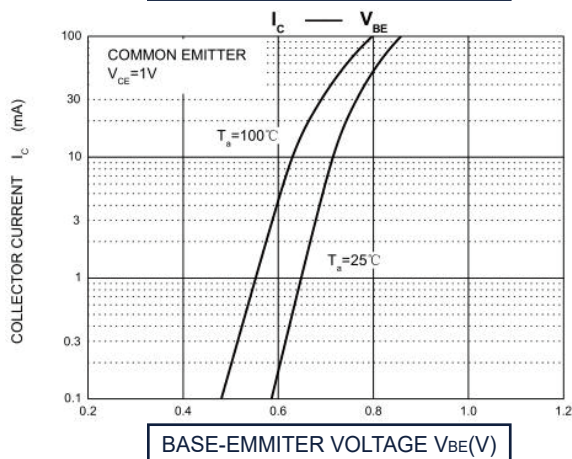
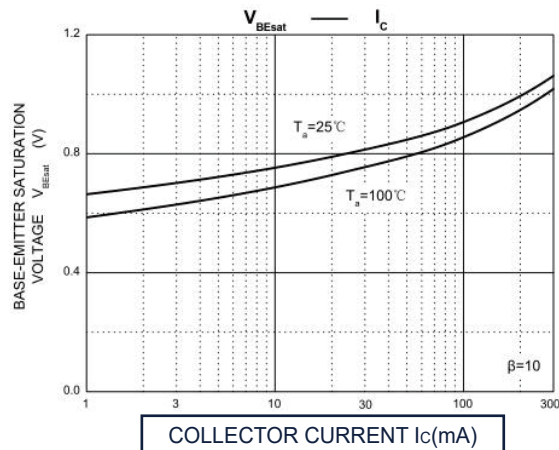
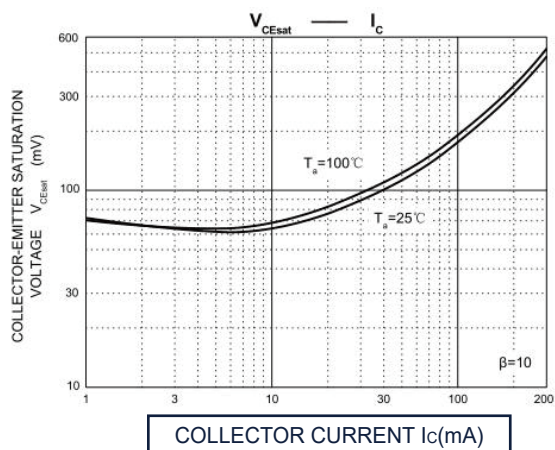
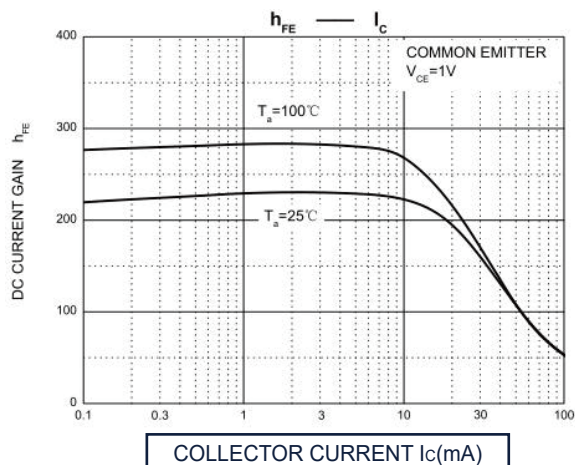
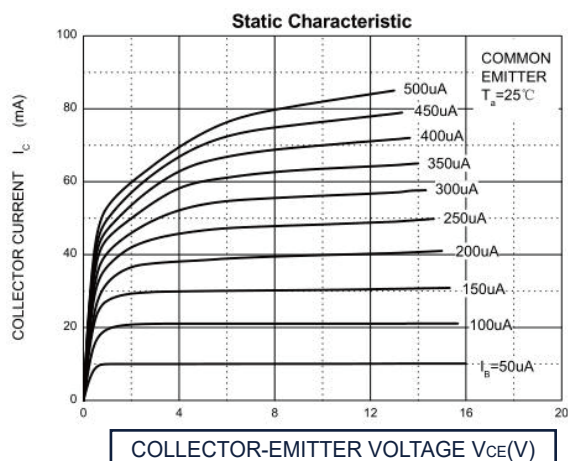


TWTLSEMI

# TL-MMBT3904

SOT23 Plastic-Encapsulate Transistors (NPN)

## Typical Characteristics





## SOT23 Package Outline Dimensions



| Symbol   | Dimensions in Millimeters |       |
|----------|---------------------------|-------|
|          | mm                        |       |
|          | Min                       | Max   |
| A        | 0.900                     | 1.150 |
| A1       | 0.000                     | 0.100 |
| A2       | 0.900                     | 1.050 |
| b        | 0.300                     | 0.500 |
| c        | 0.080                     | 0.150 |
| D        | 2.800                     | 3.000 |
| E        | 1.200                     | 1.400 |
| E1       | 2.250                     | 2.550 |
| e        | 0.950TYP                  |       |
| e1       | 1.800                     | 2.000 |
| L        | 0.550REF                  |       |
| L1       | 0.300                     | 0.500 |
| $\theta$ | 0°                        | 8°    |