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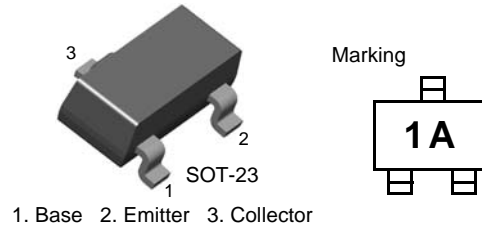
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# KST3904

## NPN Epitaxial Silicon Transistor

### Features

- General Purpose Transistor



### Absolute Maximum Ratings $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter                   | Value      | Units            |
|-----------|-----------------------------|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage      | 60         | V                |
| $V_{CEO}$ | Collector-Emitter Voltage   | 40         | V                |
| $V_{EBO}$ | Emitter-Base Voltage        | 6          | V                |
| $I_C$     | Collector Current           | 200        | mA               |
| $P_C$     | Collector Power Dissipation | 350        | mW               |
| $T_{STG}$ | Storage Temperature Range   | -55 to 150 | $^\circ\text{C}$ |

### Electrical Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol        | Parameter                              | Test Condition   | Min.                        | Max.         | Units  |
|---------------|--|--|-----------------------------|--------------|--------|
| $BV_{CBO}$    | Collector-Base Breakdown Voltage       | $I_C = 10\mu\text{A}, I_E = 0$   | 60                          |              | V      |
| $BV_{CEO}$    | * Collector-Emitter Breakdown Voltage  | $I_C = 1\text{mA}, I_B = 0$  | 40                          |              | V      |
| $BV_{EBO}$    | Emitter-Base Breakdown Voltage         | $I_E = 10\mu\text{A}, I_C = 0$   | 6                           |              | V      |
| $I_{CEX}$     | Collector Cut-off Current              | $V_{CE} = 30\text{V}, V_{EB} = 3\text{V}$  |                             | 50           | nA     |
| $h_{FE}$      | * DC Current Gain                      | $V_{CE} = 1\text{V}, I_C = 0.1\text{mA}$<br>$V_{CE} = 1\text{V}, I_C = 1\text{mA}$<br>$V_{CE} = 1\text{V}, I_C = 10\text{mA}$<br>$V_{CE} = 1\text{V}, I_C = 50\text{mA}$<br>$V_{CE} = 1\text{V}, I_C = 100\text{mA}$ | 40<br>70<br>100<br>60<br>30 | 300          |        |
| $V_{CE(sat)}$ | * Collector-Emitter Saturation Voltage | $I_C = 10\text{mA}, I_B = 1\text{mA}$<br>$I_C = 50\text{mA}, I_B = 5\text{mA}$   |                             | 0.2<br>0.3   | V<br>V |
| $V_{BE(sat)}$ | * Base-Emitter Saturation Voltage      | $I_C = 10\text{mA}, I_B = 1\text{mA}$<br>$I_C = 50\text{mA}, I_B = 5\text{mA}$   | 0.65                        | 0.85<br>0.95 | V<br>V |
| $C_{ob}$      | Output Capacitance                     | $V_{CB} = 5\text{V}, I_E = 0, f = 1\text{MHz}$   |                             | 4            | pF     |
| $f_T$         | Current Gain-Bandwidth Product         | $V_{CE} = 20\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$  | 300                         |              | MHz    |
| NF            | Noise Figure                           | $I_C = 100\mu\text{A}, V_{CE} = 5\text{V}, R_S = 1\text{k}\Omega,$<br>$f = 10\text{Hz to } 15.7\text{KHz}$   |                             | 5            | dB     |
| $t_{ON}$      | Turn On Time                           | $V_{CC} = 3\text{V}, V_{BE} = 0.5\text{V},$<br>$I_C = 10\text{mA}, I_{B1} = 1\text{mA}$  |                             | 70           | ns     |
| $t_{OFF}$     | Turn Off Time                          | $V_{CC} = 3\text{V}, I_C = 10\text{mA},$<br>$I_{B1} = I_{B2} = 1\text{mA}$   |                             | 250          | ns     |

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

## Typical Performance Characteristics

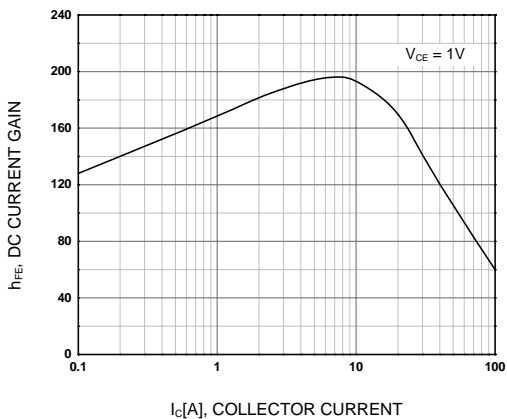


Figure 1. DC current Gain

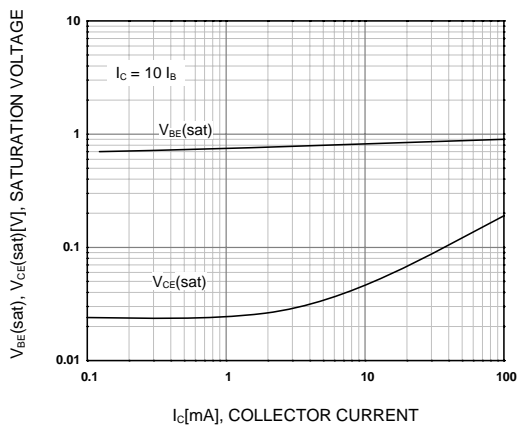


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emmitter Saturation Voltage

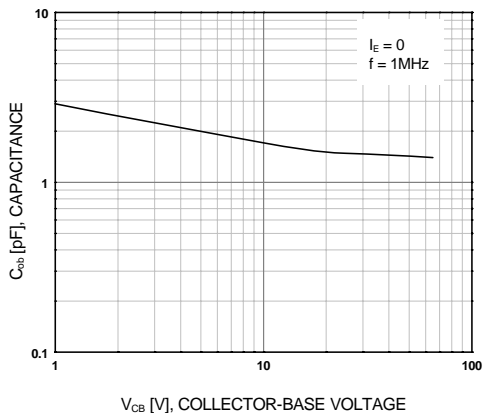


Figure 3. Output Capacitance

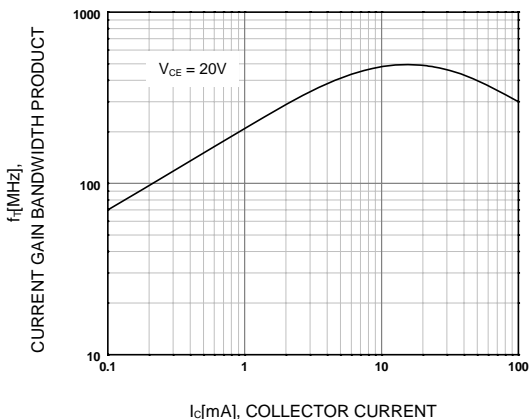
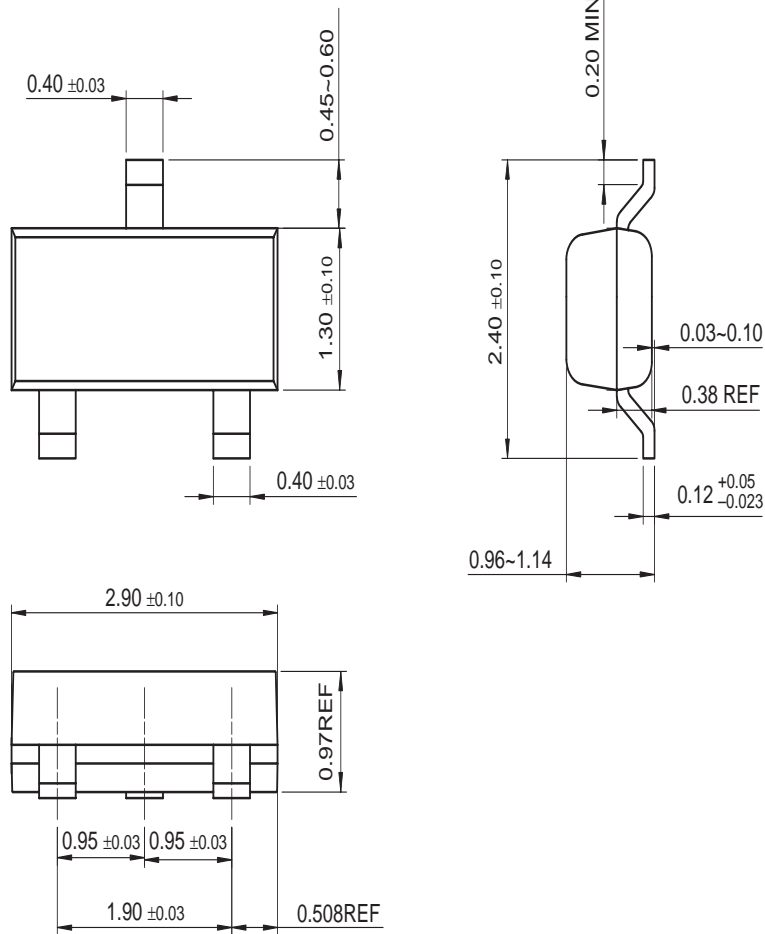


Figure 4. Current Gain Bandwidth Product

# Physical Dimensions

## SOT-23




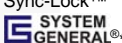


Dimensions in Millimeters



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