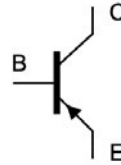
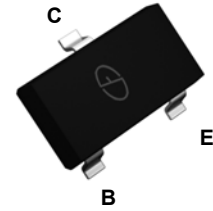


Features

- Collector currents up to 500mA
- SOT-23 plastic package
- RoHS compliant



Schematic Diagram



SOT-23

Applications

- Switching application
- General purpose amplifier

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

| Parameter | Symbol | Max. | Unit |
|---|-----------------|-------------|-----------------------------|
| Collector-Base Voltage | V_{CB0} | -40 | V |
| Collector-Emitter Voltage | V_{CE0} | -40 | V |
| Emitter-Base Voltage | V_{EB0} | -5 | V |
| Collector Current-Continuous | I_C | -600 | mA |
| Collector Power Dissipation | P_C | 300 | mW |
| Typical Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 417 | $^{\circ}\text{C}/\text{W}$ |
| Operating Junction Temperature Range | T_J | -55 To +150 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -55 To +150 | $^{\circ}\text{C}$ |

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

| Parameter | Symbol | Conditions | Min. | Max. | Unit |
|--------------------------------------|---------------|--|-------|-------|------|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=-100\mu\text{A}$, $I_E=0$ | -40 | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=-1\text{mA}$, $I_B=0$ | -40 | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=-100\mu\text{A}$, $I_C=0$ | -5 | - | V |
| Collector Cut-off Current | I_{CBO} | $V_{CB}=-35\text{V}$, $I_E=0$ | - | -100 | nA |
| Collector Cut-off Current | I_{CEX} | $V_{CE}=-35\text{V}$, $V_{EB(off)}=-0.4\text{V}$ | - | -100 | nA |
| Emitter Cut-off Current | I_{EBO} | $V_{EB}=-4\text{V}$, $I_C=0$ | - | -100 | nA |
| DC Current Gain | h_{FE} | $V_{CE}=-1\text{V}$, $I_C=-0.1\text{mA}$ | 30 | - | - |
| | | $V_{CE}=-1\text{V}$, $I_C=-1\text{mA}$ | 60 | - | - |
| | | $V_{CE}=-1\text{V}$, $I_C=-10\text{mA}$ | 100 | - | - |
| | | $V_{CE}=-2\text{V}$, $I_C=-150\text{mA}$ | 100 | 300 | - |
| | | $V_{CE}=-2\text{V}$, $I_C=-500\text{mA}$ | 20 | - | - |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-150\text{mA}$, $I_B=-15\text{mA}$ | - | -0.4 | V |
| | | $I_C=-500\text{mA}$, $I_B=-50\text{mA}$ | - | -0.75 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C=-150\text{mA}$, $I_B=-15\text{mA}$ | -0.75 | -0.95 | V |
| | | $I_C=-500\text{mA}$, $I_B=-50\text{mA}$ | - | -1.3 | V |
| Transition Frequency | f_T | $V_{CE}=-10\text{V}$, $I_C=-20\text{mA}$, $F=100\text{MHz}$ | 200 | - | MHz |
| Delay Time | t_d | $V_{CC}=-30\text{V}$, $I_C=-150\text{mA}$, $I_{B1}=-15\text{mA}$ | - | 15 | nS |
| Rise Time | t_r | | - | 20 | nS |
| Storage Time | t_s | $V_{CC}=-30\text{V}$, $I_C=-150\text{mA}$, $I_{B1}=I_{B2}=-15\text{mA}$ | - | 225 | nS |
| Fall Time | t_f | | - | 30 | nS |

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise specified)

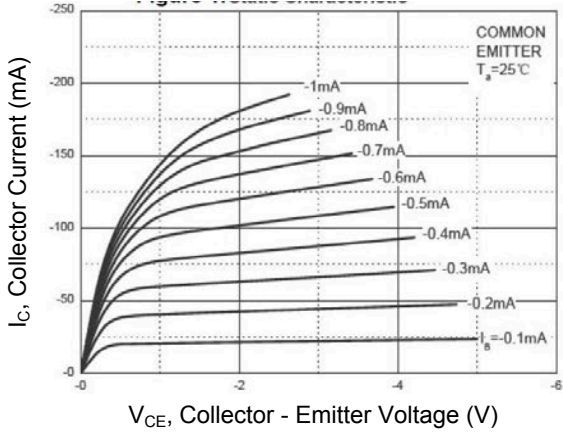


Figure 1. Static Characteristics

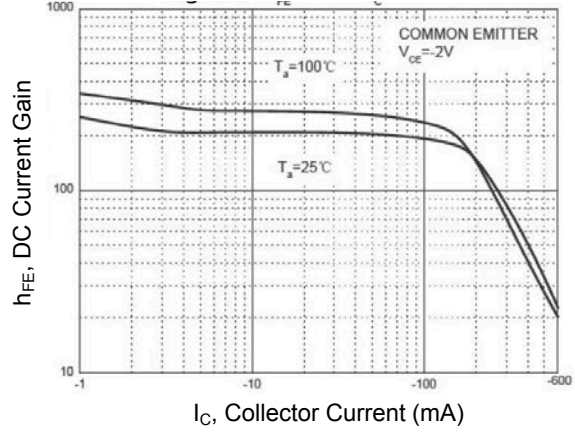


Figure 2. DC Current Gain vs. Collector Current

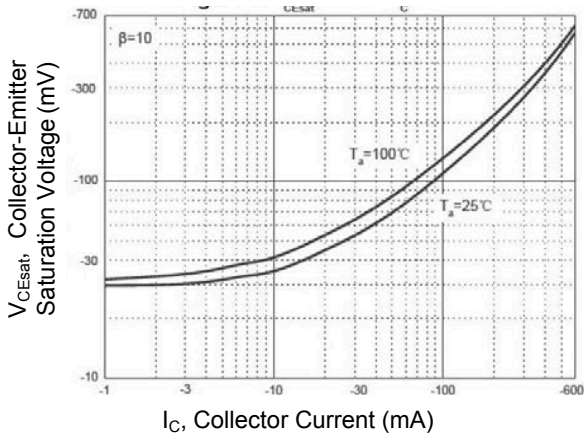


Figure 3. Collector - Emitter Saturation Voltage vs. Collector Current

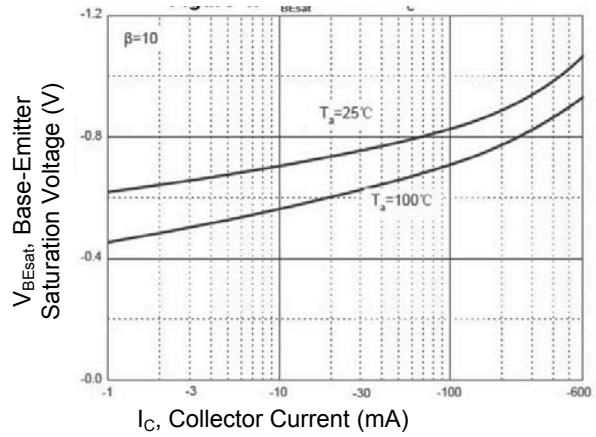


Figure 4. Base - Emitter Saturation Voltage vs. Collector Current

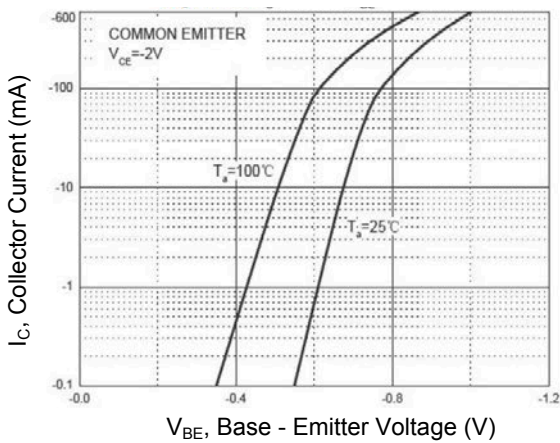


Figure 5. Collector Current vs. Base - Emitter Voltage

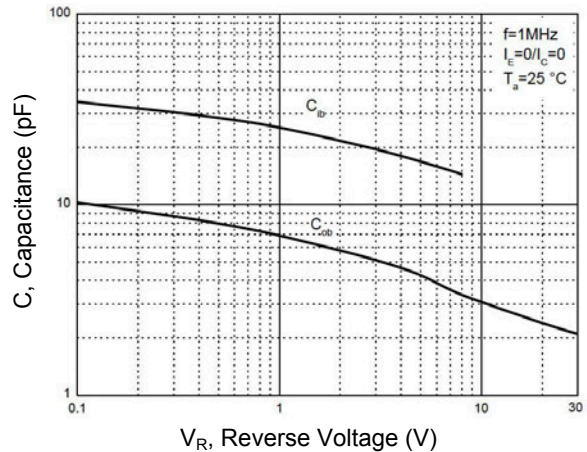


Figure 6. Capacitance Characteristics

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise specified)

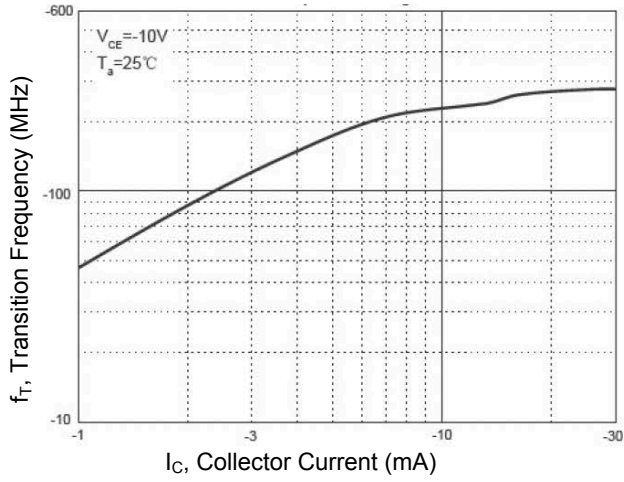


Figure 7. Transition Frequency vs. Collector Current

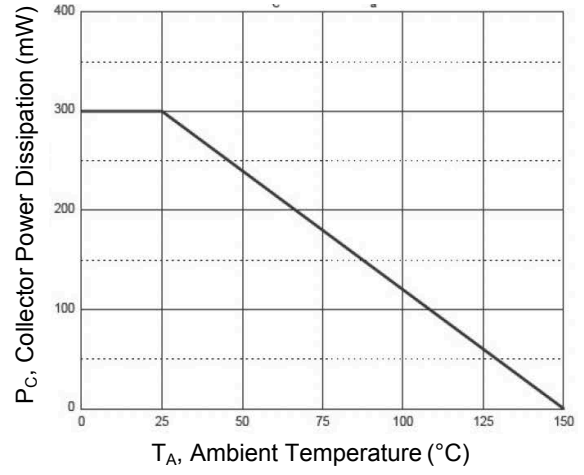
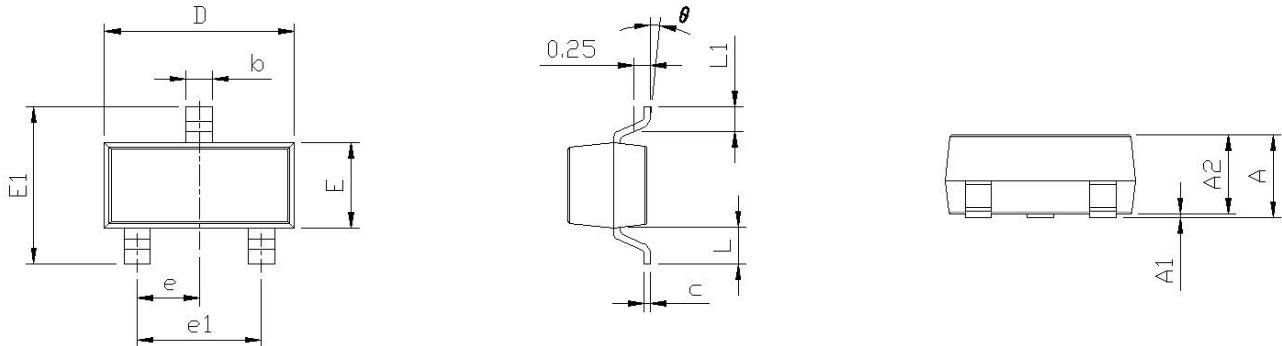


Figure 8. Power Dissipation vs Ambient Temperature

Package Outline Dimensions (SOT-23)



| 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° |

Ordering Information

| Device | Package | Marking | Quantity | HSF Status |
|----------|---------|---------|-----------------|----------------|
| MMBT4403 | SOT-23 | 2T | 3,000pcs / Reel | RoHS Compliant |