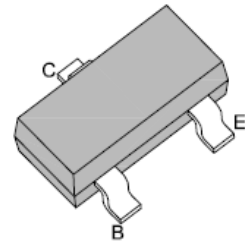
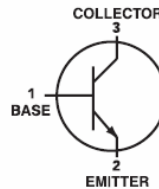


SMD General Purpose Transistor (NPN)

Features

- NPN Silicon Epitaxial Planar Transistor for Switching and Amplifier Applications



Mechanical Data

| | |
|-------------------|-----------------------------------------|
| Case: | SOT-23, Plastic Package |
| Terminals: | Solderable per MIL-STD-202G, Method 208 |
| Weight: | 0.008 gram |

SOT-23



Maximum Ratings *(T_{Ambient}=25°C unless noted otherwise)*

| Symbol | Description | MMBT8050 | Unit | Conditions |
|------------------------|------------------------------------------------------------|-------------|-------|-----------------------|
| V_{CEO} | Collector-Emitter Voltage | 25 | V | |
| V_{CBO} | Collector-Base Voltage | 40 | V | |
| V_{EB0} | Emitter-Base Voltage | 5.0 | V | |
| I_c | Collector Current | 1.5 | A | |
| P_D | Total Device Power Dissipation (Note 1) | 225 | mW | T _A =25 °C |
| | | 1.8 | mW/°C | Derate above 25 °C |
| R_{θJA} | Thermal Resistance, Junction to Ambient | 556 | °C /W | |
| P_D | Total Device Power Dissipation, Alumina Substrate (Note 2) | 300 | mW | T _A =25 °C |
| | | 2.4 | mW/°C | Derate above 25 °C |
| R_{θJA} | Thermal Resistance, Junction to Ambient | 417 | °C /W | |
| T_J | Junction Temperature | -55 to +150 | °C | |
| T_{STG} | Storage Temperature Range | -55 to +150 | °C | |

Note: 1. FR-5 Board=25.4 x 19.05 x 1.58 mm (1.0 x 0.75 x 0.062 inches.)
 2. Alumina Substrate=10.16 x 7.62 x 0.61 mm (0.4 x 0.3 x 0.024 inches.) 99.5% alumina.

SMD General Purpose Transistor (NPN)

MMBT8050

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

Off Characteristics

| Symbol | Description | Min. | Max. | Unit | Conditions |
|---------------|-------------------------------------|------|------|---------------|-------------------------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | 25 | - | V | $I_C=0.1\text{mA}$, $I_B=0$ |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | 40 | - | V | $I_C=0.1\text{mA}$, $I_E=0$ |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | 5.0 | - | V | $I_E=0.1\text{mA}$, $I_C=0$ |
| I_{CEO} | Collector Cut-off Current | - | 0.15 | μA | $V_{CE}=20\text{V}$, $I_E=0$ |
| I_{CBO} | Base Cut-off Current | - | 0.15 | μA | $V_{CB}=35\text{V}$, $I_E=0$ |
| I_{EBO} | Emitter Cut-off Current | - | 0.15 | μA | $V_{EB}=4\text{V}$, $I_C=0$ |

On Characteristics

| Symbol | Description | Min. | Max. | Unit | Conditions |
|---------------|--------------------------------------|------|------|------|-----------------------------------------|
| h_{FE} | D.C. Current Gain | 120 | 600 | | $V_{CE}=1\text{V}$, $I_C=100\text{mA}$ |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | - | 0.5 | V | $I_C=800\text{mA}$, $I_B=80\text{mA}$ |

Small-signal Characteristics

| Symbol | Description | Min. | Max. | Unit | Conditions |
|--------|--------------------------------|------|------|------|---------------------------------------------------------------|
| f_T | Current Gain-Bandwidth Product | 100 | - | MHz | $V_{CE}=10\text{V}$, $I_C=50\text{mA}$, $f=30\text{MHz}$ |

Classification Of h_{FE}

| Rank | P | Q | R | S |
|---------|---------|---------|---------|---------|
| Range | 120-200 | 150-300 | 200-400 | 300-600 |
| Marking | 1HA | 1HC | 1HE | 1HG |

SMD General Purpose Transistor (NPN)

MMBT8050

Typical Characteristics Curves

Fig.1- Static Characteristic

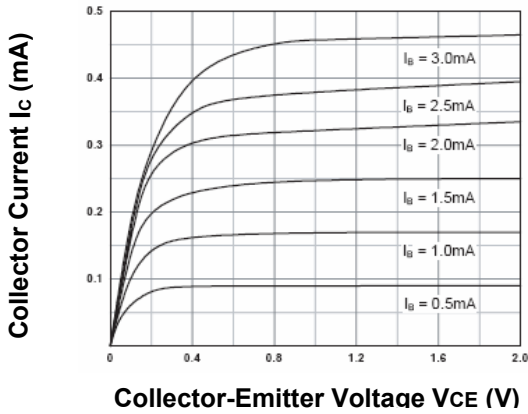


Fig.2- DC Current Gain

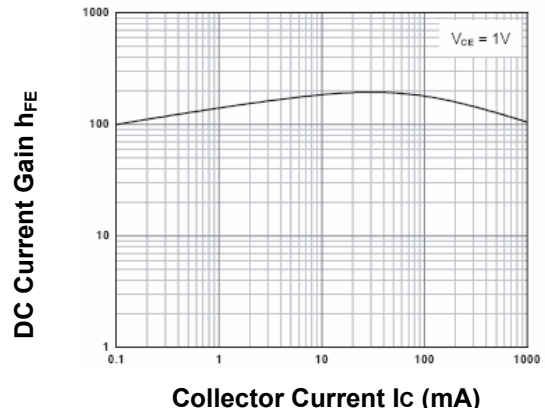


Fig.3- Collector-Emitter Saturation Voltage
Base-Emitter Saturation Voltage

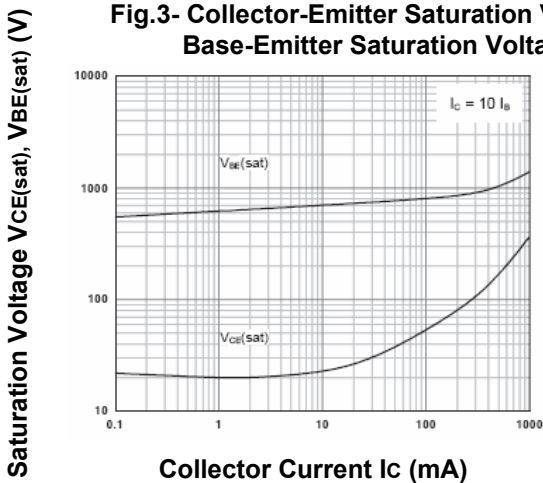


Fig.4- Base-Emitter On Voltage

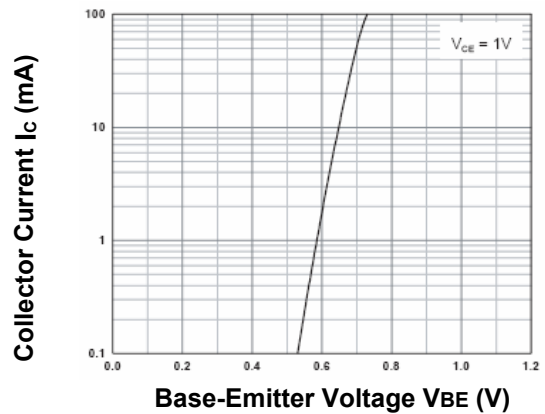
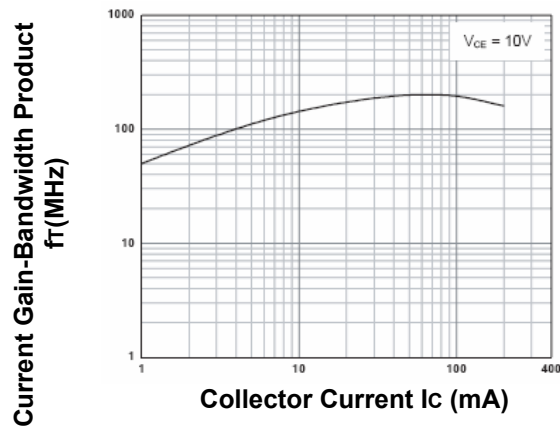


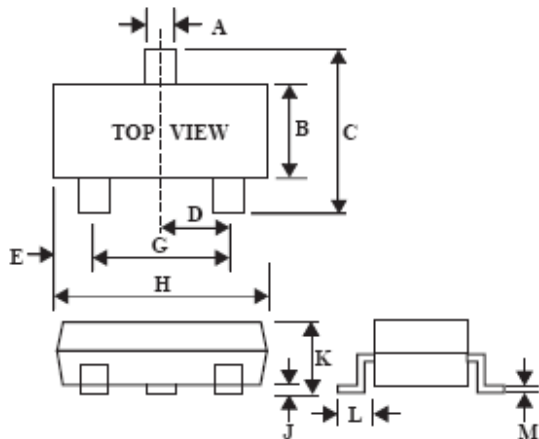
Fig.5- Current Gain Bandwidth Product



SMD General Purpose Transistor (NPN)

MMBT8050

Dimensions in mm



| SOT-23 | | |
|--------|-------|------|
| Dim | Min | Max |
| A | 0.35 | 0.51 |
| B | 1.19 | 1.40 |
| C | 2.10 | 3.00 |
| D | 0.85 | 1.05 |
| E | 0.46 | 1.00 |
| G | 1.70 | 2.10 |
| H | 2.70 | 3.10 |
| J | 0.01 | 0.13 |
| K | 0.89 | 1.10 |
| L | 0.30 | 0.61 |
| M | 0.076 | 0.25 |

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