



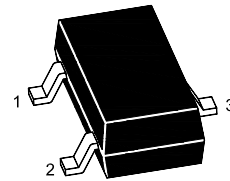
MMBT9014

NPN Transistor

Features

- For Switching and Amplifier Applications.
- As Complementary Type of the PNP Transistor MMBT9015 is Recommended.

SOT-23
(TO-236)



1.Base 2.Emitter 3.Collector

Marking: MMBT9014B--1E
MMBT9014C--1F
MMBT9014D--28S

Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Value | Unit |
|---------------------------|-----------|------------|------|
| Collector Base Voltage | V_{CB0} | 50 | V |
| Collector Emitter Voltage | V_{CEO} | 45 | V |
| Emitter Base Voltage | V_{EBO} | 5 | V |
| Collector Current | I_C | 100 | mA |
| Power Dissipation | P_D | 200 | mW |
| Junction Temperature | T_J | 150 | °C |
| Storage Temperature Range | T_{STG} | -55 to 150 | °C |

Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|-------------------------|-------------------|-------------|-------------------|------|
| DC Current Gain at $V_{CE} = 5\text{ V}$, $I_C = 1\text{ mA}$ Current Gain Group | B C D H_{FE} | 110 200 420 | - - - | 220 450 800 | |
| Collector Base Cutoff Current at $V_{CB} = 50\text{ V}$ | I_{CB0} | - | - | 50 | nA |
| Emitter Base Cutoff Current at $V_{EB} = 5\text{ V}$ | I_{EBO} | - | - | 50 | nA |
| Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$ | $V_{(BR)CB0}$ | 50 | - | - | V |
| Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$ | $V_{(BR)CEO}$ | 45 | - | - | V |
| Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$ | $V_{(BR)EBO}$ | 5 | - | - | V |
| Collector Emitter Saturation Voltage at $I_C = 100\text{ mA}$, $I_B = 10\text{ mA}$ | $V_{CE(sat)}$ | - | - | 0.25 | V |
| Base Emitter Saturation Voltage at $I_C = 100\text{ mA}$, $I_B = 5\text{ mA}$ | $V_{BE(sat)}$ | - | - | 1 | V |
| Transition Frequency at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$ | F_T | 100 | - | - | MHz |
| Collector Base Capacitance at $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$ | C_{ob} | - | - | 6 | pF |



Electrical Characteristics Curves

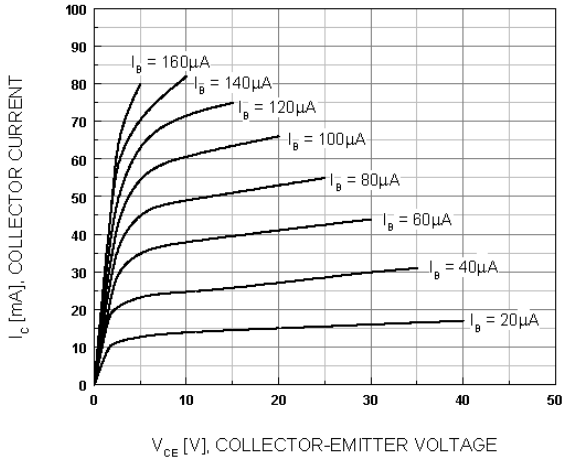


Figure 1. Static Characteristic

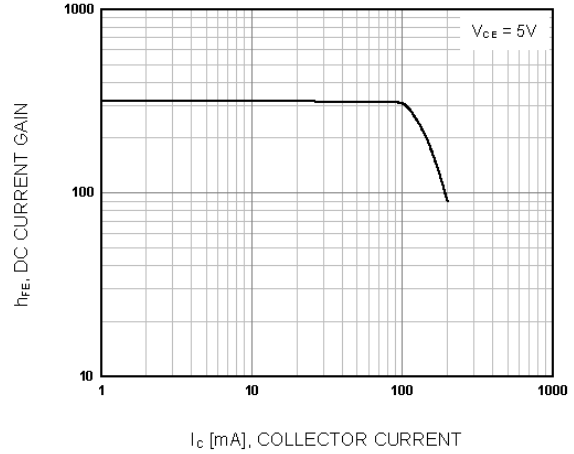


Figure 2. DC current Gain

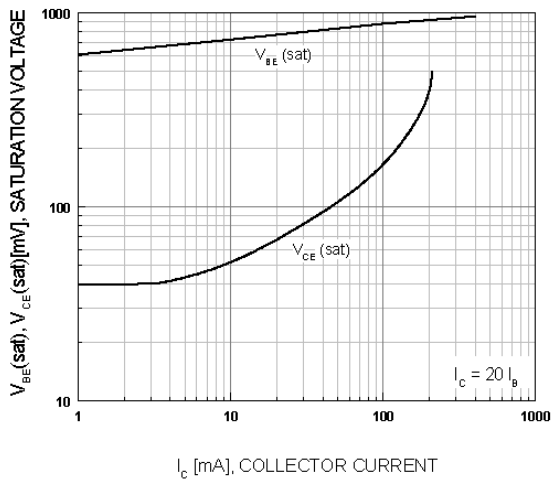


Figure 3. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

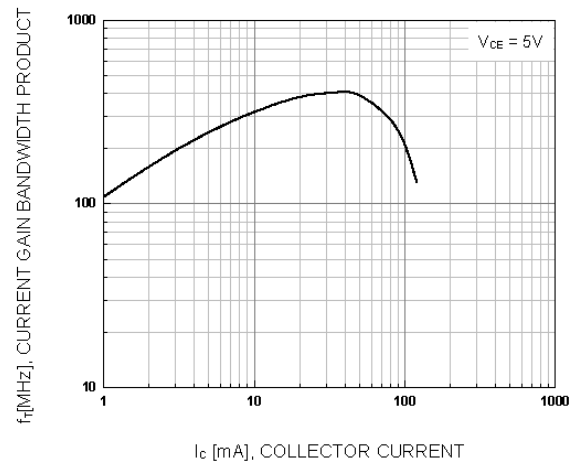
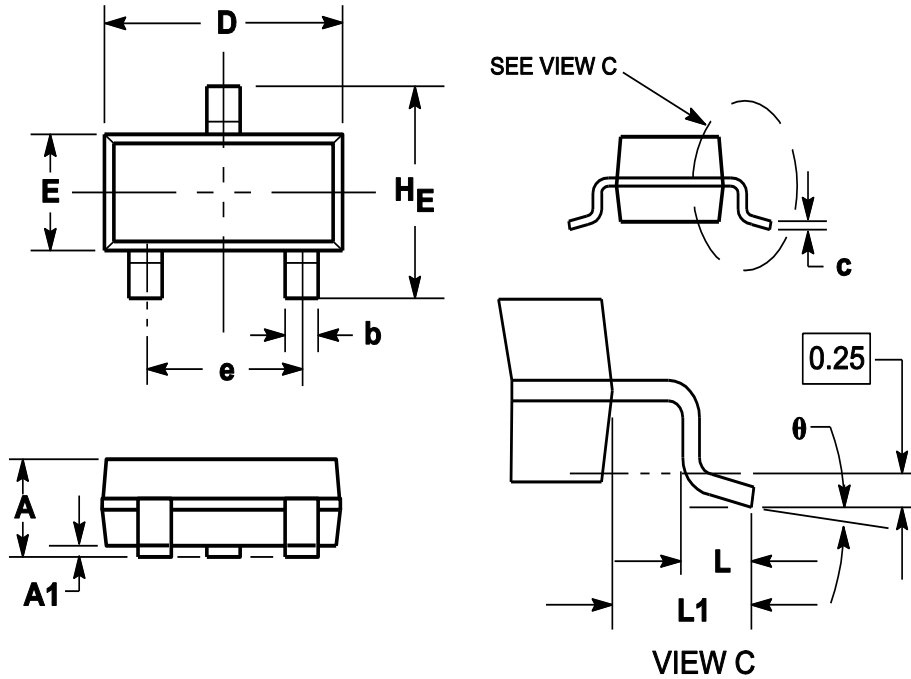


Figure 4. Current Gain Bandwidth Product



Package Outline(SOT-23)



| Symbol | Dimensions in millimeter | | |
|----------|--------------------------|-------|-------|
| | Min. | Typ. | Max. |
| A | 0.900 | 1.025 | 1.150 |
| A1 | 0.000 | 0.050 | 0.100 |
| b | 0.300 | 0.400 | 0.500 |
| c | 0.080 | 0.115 | 0.150 |
| D | 2.800 | 2.900 | 3.000 |
| E | 1.200 | 1.300 | 1.400 |
| HE | 2.250 | 2.400 | 2.550 |
| e | 1.800 | 1.900 | 2.000 |
| L1 | 0.550REF | | |
| L | 0.300 | | 0.500 |
| θ | 0° | | 8° |

Ordering Information

| Device | Package | Reel Dimension (inch) | Shipping |
|----------|---------|-----------------------|----------|
| MMBT9014 | SOT-23 | 7 | 3,000 |