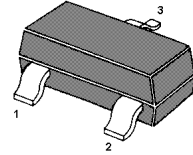


# MMBT9011

## NPN Silicon Epitaxial Planar Transistor

for switching and AF amplifier applications.

The transistor is subdivided into two groups, G and H, according to its DC current gain.



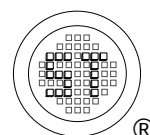
1. Base 2. Emitter 3. Collector  
TO-236 Plastic Package

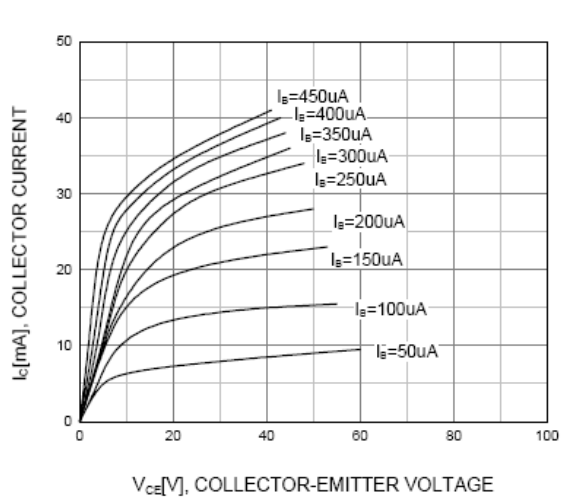
### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| Parameter                 | Symbol    | Value         | Unit             |
|---------------------------|-----------|---------------|------------------|
| Collector Base Voltage    | $V_{CBO}$ | 50            | V                |
| Collector Emitter Voltage | $V_{CEO}$ | 30            | V                |
| Emitter Base Voltage      | $V_{EBO}$ | 5             | V                |
| Collector Current         | $I_C$     | 30            | mA               |
| Power Dissipation         | $P_{tot}$ | 200           | mW               |
| Junction Temperature      | $T_j$     | 150           | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{stg}$ | - 55 to + 150 | $^\circ\text{C}$ |

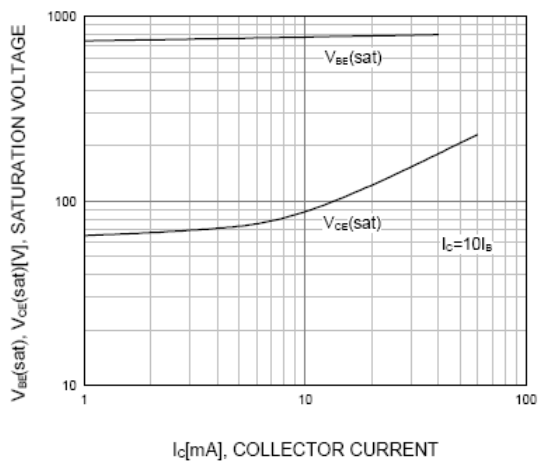
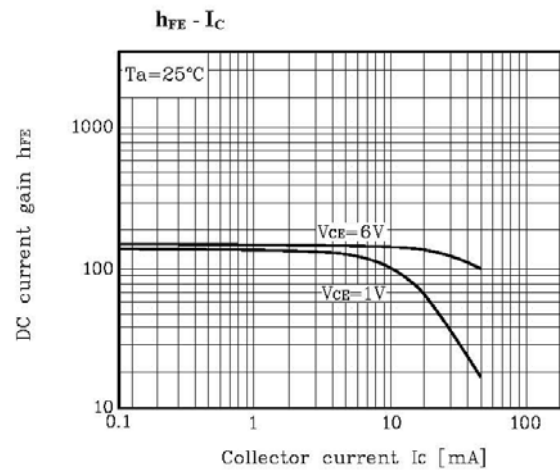
### Characteristics at $T_a = 25^\circ\text{C}$

| Parameter                                                                             | Symbol        | Min. | Typ. | Max. | Unit |
|---------------------------------------------------------------------------------------|---------------|------|------|------|------|
| DC Current Gain<br>at $V_{CE} = 5\text{ V}$ , $I_C = 1\text{ mA}$                     | $h_{FE}$      | 72   | -    | 108  | -    |
| Current Gain Group G                                                                  | $h_{FE}$      | 97   | -    | 190  | -    |
| Collector Base Cutoff Current<br>at $V_{CB} = 50\text{ V}$                            | $I_{CBO}$     | -    | -    | 100  | nA   |
| Emitter Base Cutoff Current<br>at $V_{EB} = 5\text{ V}$                               | $I_{EBO}$     | -    | -    | 100  | nA   |
| Collector Base Breakdown Voltage<br>at $I_C = 100\text{ }\mu\text{A}$                 | $V_{(BR)CBO}$ | 50   | -    | -    | V    |
| Collector Emitter Breakdown Voltage<br>at $I_C = 1\text{ mA}$                         | $V_{(BR)CEO}$ | 30   | -    | -    | V    |
| Emitter Base Breakdown Voltage<br>at $I_E = 100\text{ }\mu\text{A}$                   | $V_{(BR)EBO}$ | 5    | -    | -    | V    |
| Collector Emitter Saturation Voltage<br>at $I_C = 10\text{ mA}$ , $I_B = 1\text{ mA}$ | $V_{CE(sat)}$ | -    | -    | 0.3  | V    |
| Base Emitter on Voltage<br>at $V_{CE} = 5\text{ V}$ , $I_C = 1\text{ mA}$             | $V_{BE(on)}$  | 0.60 | -    | 0.75 | V    |
| Collector Base Capacitance<br>at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$          | $C_{ob}$      | -    | 1.5  | -    | pF   |
| Gain Bandwidth Product<br>at $V_{CE} = 5\text{ V}$ , $I_C = 1\text{ mA}$              | $f_T$         | 150  | 370  | -    | MHz  |





Static Characteristic



Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

