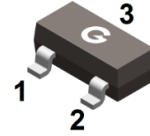
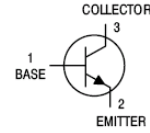


## Features

- High current capacity in compact package ( $I_C = 1.5A$ )
- Complimentary to MMBTH8550
- RoHS compliant with Halogen-free

HF



SOT-23

## Mechanical Data

- Case: SOT-23
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208

## Ordering Information

| Part Number | Package | Shipping Quantity      | Marking Code |
|-------------|---------|------------------------|--------------|
| MMBTH8050-P | SOT-23  | 3000 pcs / Tape & Reel | KEO          |
| MMBTH8050-Q | SOT-23  | 3000 pcs / Tape & Reel | KEY          |

## Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

| Parameter                           | Symbol    | Value      | Unit       |
|-------------------------------------|-----------|------------|------------|
| Collector-Base Breakdown Voltage    | $V_{CBO}$ | 50         | V          |
| Collector-Emitter Breakdown Voltage | $V_{CEO}$ | 50         | V          |
| Emitter-Base Breakdown Voltage      | $V_{EBO}$ | 6          | V          |
| Collector Current (Continuous)      | $I_C$     | 1.5        | A          |
| Collector Current (Peak)            | $I_{CM}$  | 2          | A          |
| Power Dissipation                   | $P_D$     | 0.35       | W          |
| Junction Temperature Range          | $T_J$     | -55 ~ +150 | $^\circ C$ |
| Storage Temperature Range           | $T_{STG}$ | -55 ~ +150 | $^\circ C$ |

## Thermal Characteristics

| Parameter                                         | Symbol          | Min. | Typ. | Max. | Unit         |
|---------------------------------------------------|-----------------|------|------|------|--------------|
| Thermal Resistance Junction-to-Air <sup>*1</sup>  | $R_{\theta JA}$ | -    | -    | 350  | $^\circ C/W$ |
| Thermal Resistance Junction-to-Case <sup>*1</sup> | $R_{\theta JC}$ | -    | -    | 150  | $^\circ C/W$ |
| Thermal Resistance Junction-to-Lead <sup>*1</sup> | $R_{\theta JL}$ | -    | -    | 125  | $^\circ C/W$ |

Note 1: The data tested by surface mounted on a 15mm \* 15mm \* 1mm FR4-epoxy P.C.B

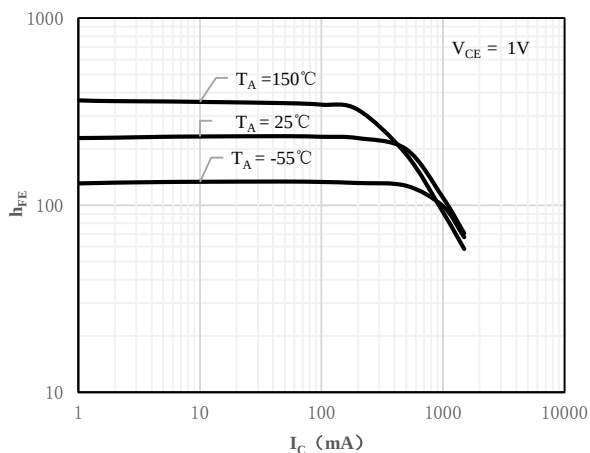
### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                            | Symbol        | Test Condition                                  | Min. | Typ. | Max. | Unit          |
|--------------------------------------|---------------|-------------------------------------------------|------|------|------|---------------|
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}, I_E = 0$                 | 50   | -    | -    | V             |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C = 2\text{mA}, I_B = 0$                     | 50   | -    | -    | V             |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E = 100\mu\text{A}, I_C = 0$                 | 6    | -    | -    | V             |
| Collector Cut-off Current            | $I_{CBO}$     | $V_{CB} = 35\text{V}, I_E = 0$                  | -    | -    | 0.1  | $\mu\text{A}$ |
| Emitter Cut-off Current              | $I_{EBO}$     | $V_{EB} = 6\text{V}, I_C = 0$                   | -    | -    | 0.1  | $\mu\text{A}$ |
| DC Current Gain                      | $h_{FE}$      | $V_{CE} = 1\text{V}, I_C = 0.1\text{A}$         | 100  | -    | 320  | -             |
|                                      |               | $V_{CE} = 1\text{V}, I_C = 0.8\text{A}$         | 40   | -    | -    | -             |
| Collector-emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 0.8\text{A}, I_B = 0.08\text{A}$         | -    | -    | 0.5  | V             |
| Base-emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 0.8\text{A}, I_B = 0.08\text{A}$         | -    | -    | 1.2  | V             |
| Base-emitter on Voltage              | $V_{BE(on)}$  | $V_{CE} = 1\text{V}, I_C = 10\text{mA}$         | -    | -    | 1    | V             |
| Transition Frequency                 | $f_T$         | $I_C = 50\text{mA}, V_{CE} = 10\text{V}$        | 120  | -    | -    | MHz           |
| Collector Output Capacitance         | $C_{OB}$      | $V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$ | -    | 6.5  | -    | pF            |

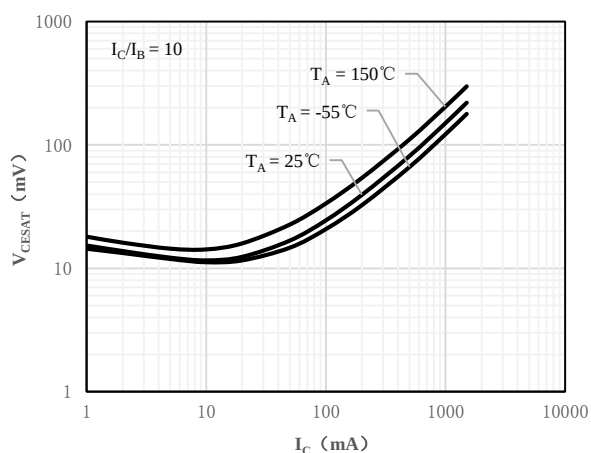
### Classification of $h_{FE}$

| Rank  | P       | Q       |
|-------|---------|---------|
| Range | 100-200 | 160-320 |

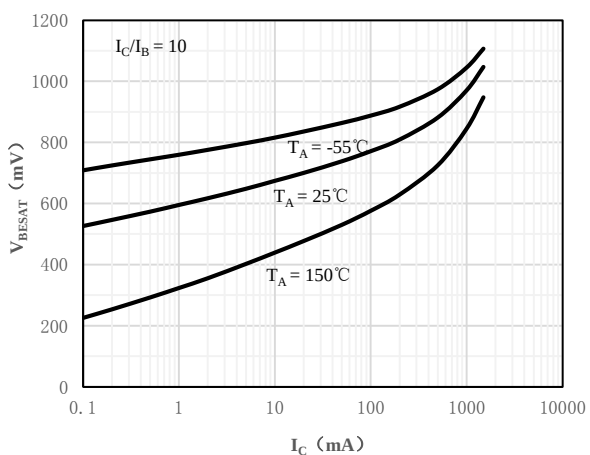
**Ratings and Characteristics Curves** (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)



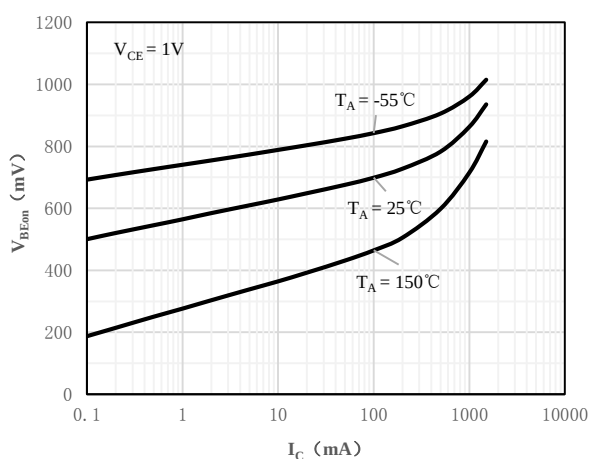
**Fig 1**  $h_{FE}$  vs.  $I_C$



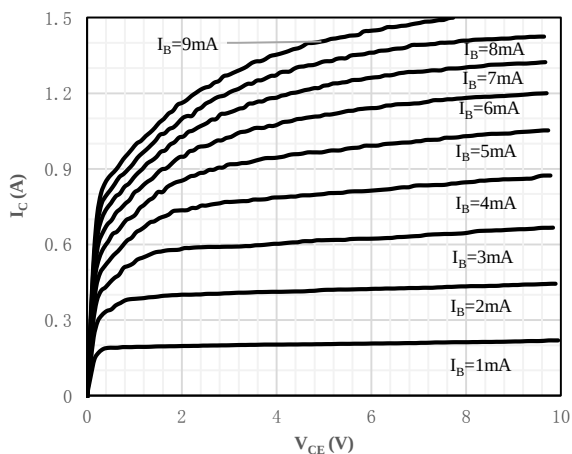
**Fig 2**  $V_{CE(sat)}$  vs.  $I_C$



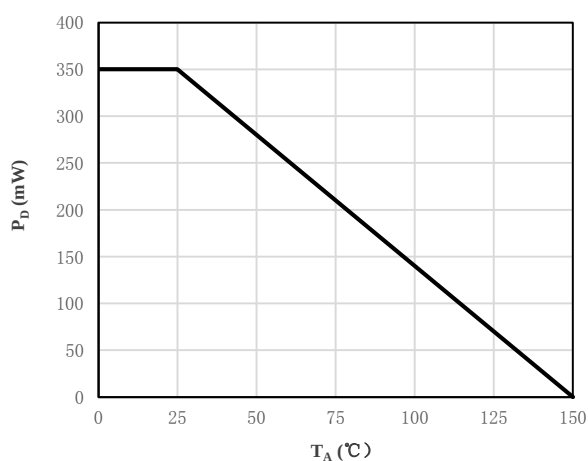
**Fig 3**  $V_{BE(sat)}$  vs.  $I_C$



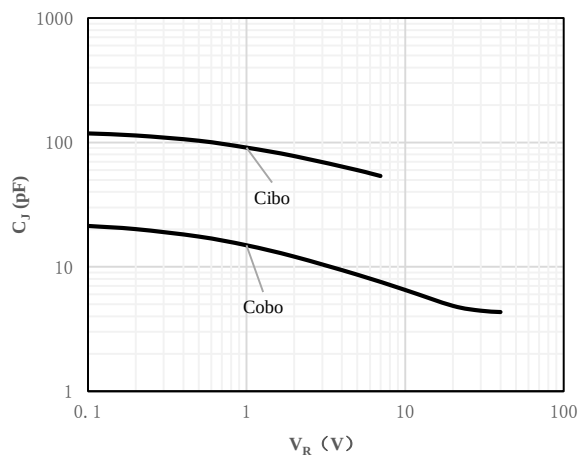
**Fig 4**  $V_{BE(on)}$  vs.  $I_C$



**Fig 5**  $I_C$  vs.  $V_{CE}$

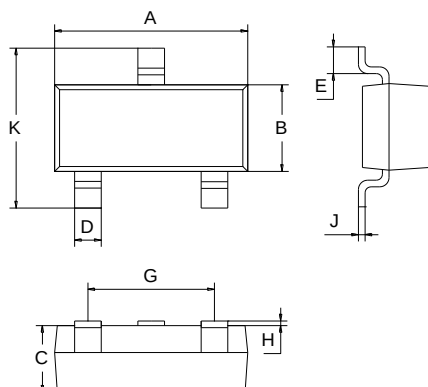


**Fig 6**  $P_D$  vs.  $T_A$



**Fig 7** C<sub>J</sub> vs. V<sub>R</sub>

**Package Outline Dimensions** (Unit: mm)



| SOT-23    |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 2.70 | 3.10 |
| B         | 1.10 | 1.50 |
| C         | 0.90 | 1.10 |
| D         | 0.30 | 0.50 |
| E         | 0.35 | 0.48 |
| G         | 1.80 | 2.00 |
| H         | 0.02 | 0.10 |
| J         | 0.05 | 0.15 |
| K         | 2.20 | 2.60 |

**Package Outline Dimensions** (Unit: mm)

**SOT-23**

