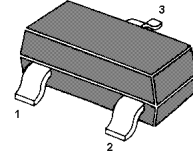




## NPN Silicon Epitaxial Planar Transistor

High frequency amplifier

The transistor is subdivided into three groups, R, O and Y, according to its DC current gain.



1.Base 2.Emitter 3.Collector  
SOT-23 Plastic Package

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

| Parameter                 | Symbol    | Value    | Unit             |
|---------------------------|-----------|----------|------------------|
| Collector Base Voltage    | $V_{CBO}$ | 30       | V                |
| Collector Emitter Voltage | $V_{CEO}$ | 20       | V                |
| Emitter-Base Voltage      | $V_{EBO}$ | 4        | V                |
| Collector Current         | $I_C$     | 20       | mA               |
| Power Dissipation         | $P_{tot}$ | 200      | mW               |
| Junction Temperature      | $T_j$     | 150      | $^\circ\text{C}$ |
| Storage Temperature Range | $T_s$     | -55 +150 | $^\circ\text{C}$ |

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

| Parameter   | Symbol            | Min.     | Typ. | Max. | Unit          |   |
|---|-------------------|----------|------|------|---------------|---|
| DC Current Gain<br>at $V_{CE} = 6\text{ V}$ , $I_C = 1\text{ mA}$ Current Gain Group                              | R                 | $h_{FE}$ | 40   | -    | 80            | - |
|   | O                 | $h_{FE}$ | 60   | -    | 120           | - |
|   | Y                 | $h_{FE}$ | 90   | -    | 180           | - |
| Collector Emitter Saturation Voltage<br>at $I_C = 10\text{ mA}$ , $I_B = 1\text{ mA}$                             | $V_{CE(sat)}$     | -        | -    | 0.3  | V             |   |
| Collector Cutoff Current<br>at $V_{CB} = 30\text{ V}$   | $I_{CBO}$         | -        | -    | 0.1  | $\mu\text{A}$ |   |
| Emitter Cutoff Current<br>at $V_{EB} = 4\text{ V}$  | $I_{EBO}$         | -        | -    | 0.1  | $\mu\text{A}$ |   |
| Collector Base Breakdown Voltage<br>at $I_C = 10\text{ }\mu\text{A}$  | $V_{(BR)CBO}$     | 30       | -    | -    | V             |   |
| Collector Emitter Breakdown Voltage<br>at $I_C = 1\text{ mA}$   | $V_{(BR)CEO}$     | 20       | -    | -    | V             |   |
| Emitter Base Breakdown Voltage<br>at $I_E = 10\text{ }\mu\text{A}$  | $V_{(BR)EBO}$     | 4        | -    | -    | V             |   |
| Gain Bandwidth Product<br>at $V_{CE} = 6\text{ V}$ , $-I_E = 1\text{ mA}$   | $f_T$             | 400      | 600  | -    | MHz           |   |
| Output Capacitance<br>at $V_{CB} = 6\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$                                   | $C_{OB}$          | -        | 1    | -    | pF            |   |
| Collector to Base Time Constant<br>at $V_{CE} = 6\text{ V}$ , $-I_E = 1\text{ mA}$ , $f = 31.9\text{ MHz}$        | $C_C\text{-rb'b}$ | -        | 12   | -    | ps            |   |
| Noise Figure<br>at $V_{CE} = 6\text{ V}$ , $-I_E = 1\text{ mA}$ , $f = 100\text{ MHz}$ , $R_G = 50\text{ }\Omega$ | NF                | -        | 3    | -    | dB            |   |



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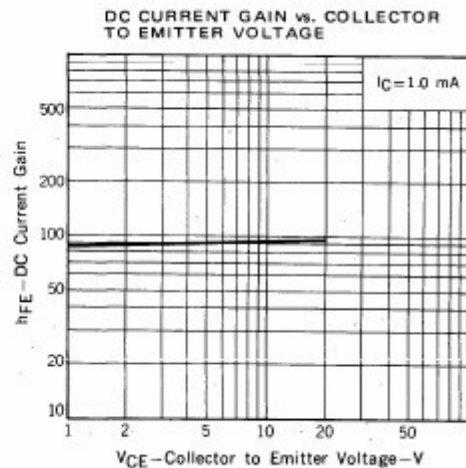
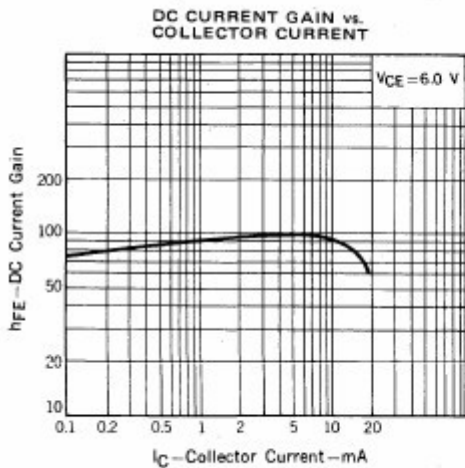
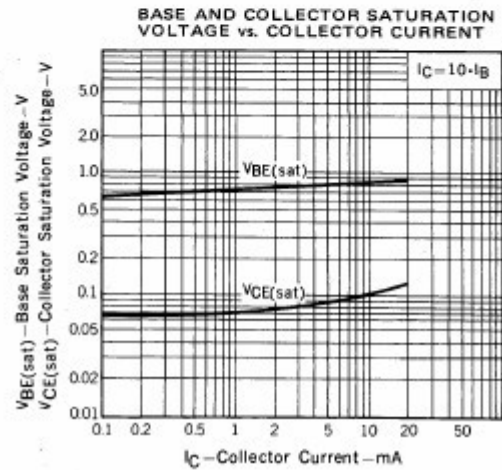
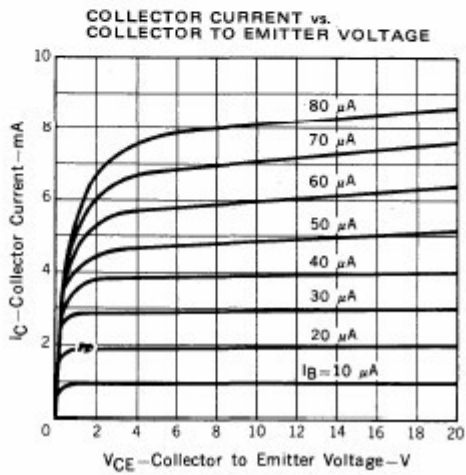
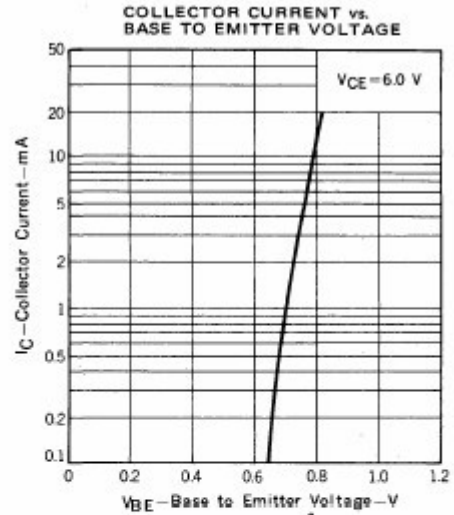
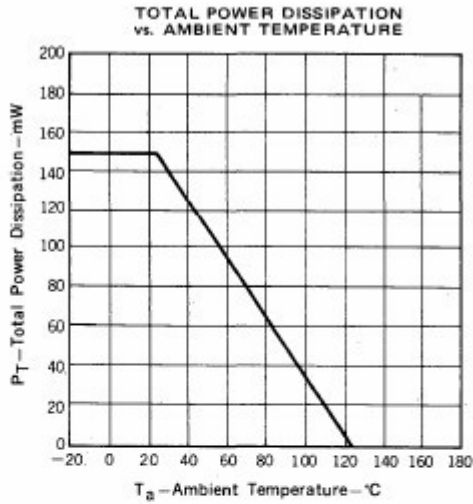
**SOT-23**

**MMBTSC2223**



www.china-base.com.hk

**TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$  unless otherwise noted)**





**CHINA BASE**  
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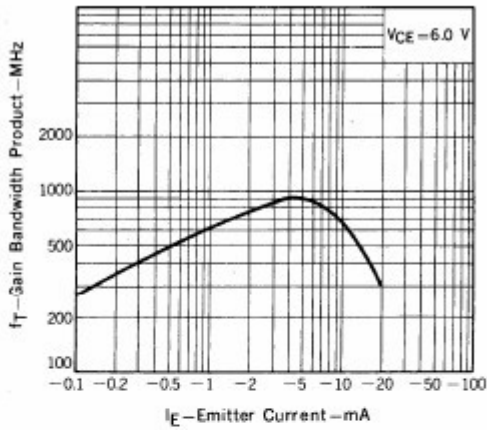
**SOT-23**

**MMBTSC2223**

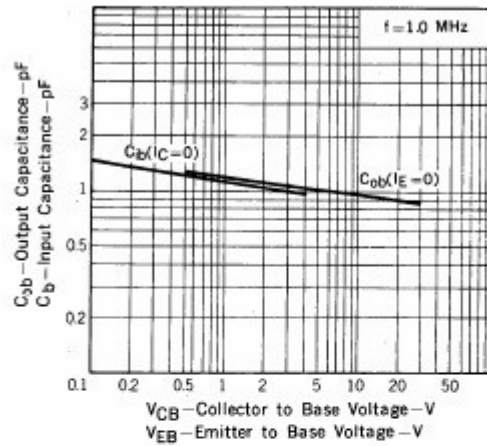


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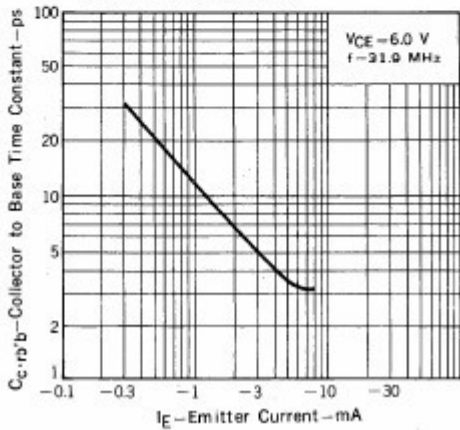
**GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT**



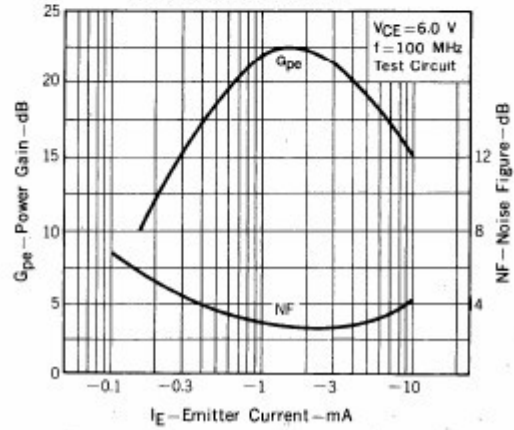
**INPUT CAPACITANCE vs. EMITTER TO BASE VOLTAGE, OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE**



**COLLECTOR TO BASE TIME CONSTANT vs. EMITTER CURRENT**



**POWER GAIN, NOISE FIGURE vs. EMITTER CURRENT**

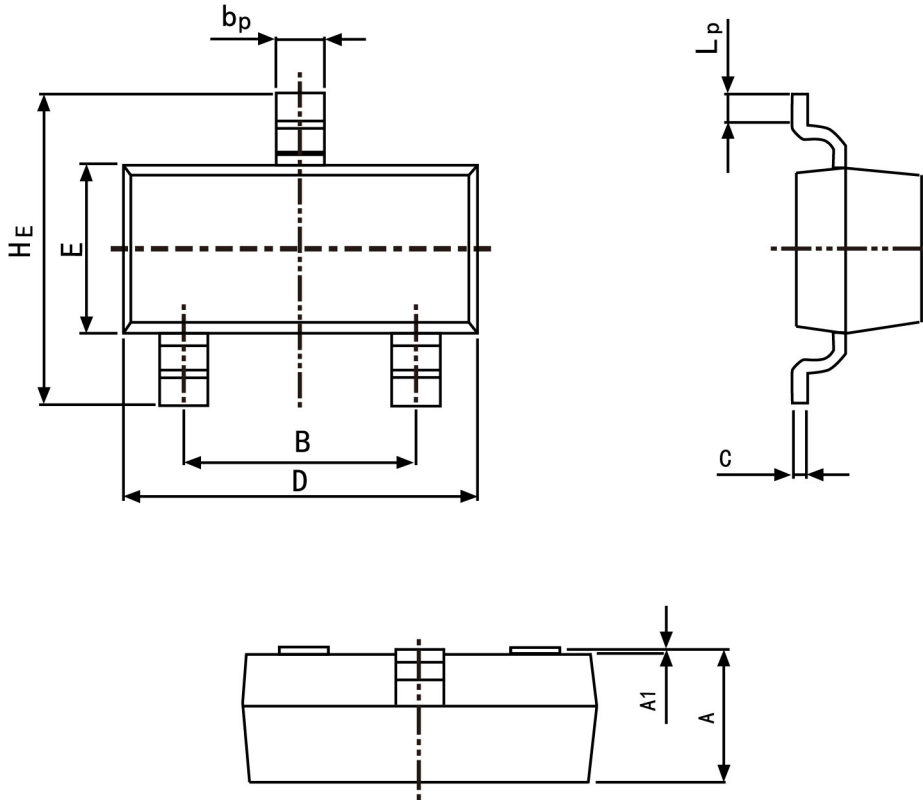




PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| Symbol | Dimension in Millimeters |       |
|--------|--------------------------|-------|
|        | Min                      | Max   |
| A      | 0.95                     | 1.40  |
| B      | 1.78                     | 2.04  |
| bp     | 0.35                     | 0.50  |
| C      | 0.08                     | 0.19  |
| D      | 2.70                     | 3.10  |
| E      | 1.20                     | 1.65  |
| HE     | 2.20                     | 3.00  |
| A1     | 0.100                    | 0.013 |
| Lp     | 0.20                     | 0.50  |