

# MSG33002

## SiGe HBT type

For low-noise RF amplifier

### ■ Features

- Compatible between high breakdown voltage and high cutoff frequency
- Low-noise, high-gain amplification
- Suitable for high-density mounting and downsizing of the equipment for Ultraminiature package  
0.8 mm × 1.2 mm (height 0.52 mm)

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

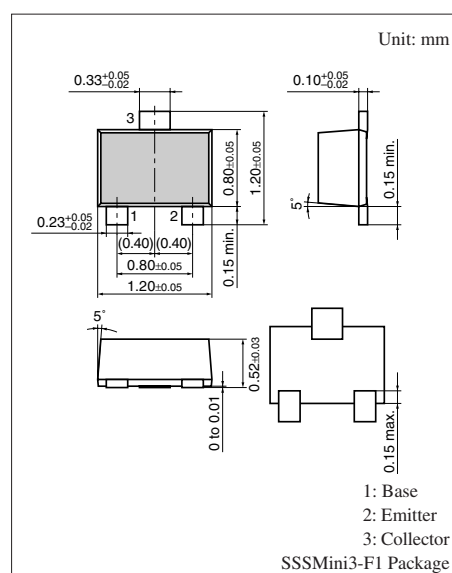
| Parameter                             | Symbol    | Rating      | Unit             |
|---------------------------------------|-----------|-------------|------------------|
| Collector-base voltage (Emitter open) | $V_{CBO}$ | 9           | V                |
| Collector-emitter voltage (Base open) | $V_{CEO}$ | 6           | V                |
| Emitter-base voltage (Collector open) | $V_{EBO}$ | 1           | V                |
| Collector current                     | $I_C$     | 60          | mA               |
| Collector power dissipation*          | $P_C$     | 100         | mW               |
| Junction temperature                  | $T_j$     | 125         | $^\circ\text{C}$ |
| Storage temperature                   | $T_{stg}$ | -55 to +125 | $^\circ\text{C}$ |

Note) \*: Copper plate at the collector is 5.0 cm<sup>2</sup> on substrate at 10 mm × 12 mm × 0.8 mm.

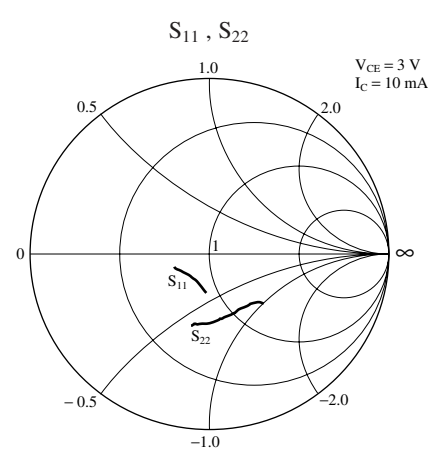
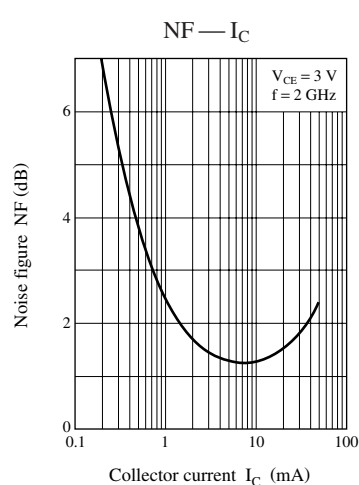
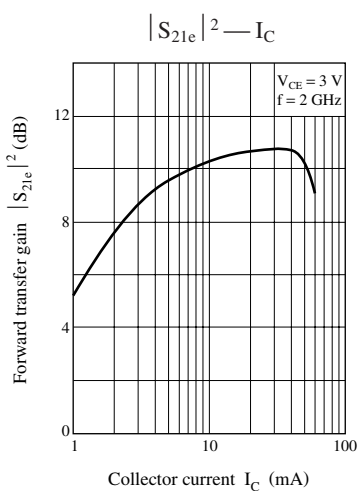
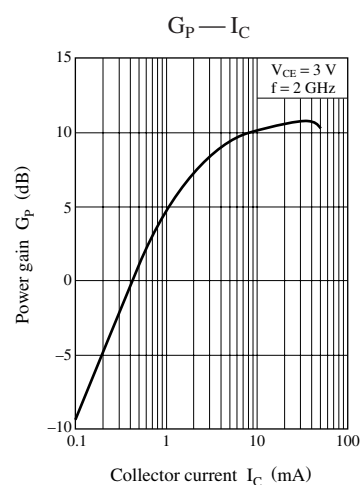
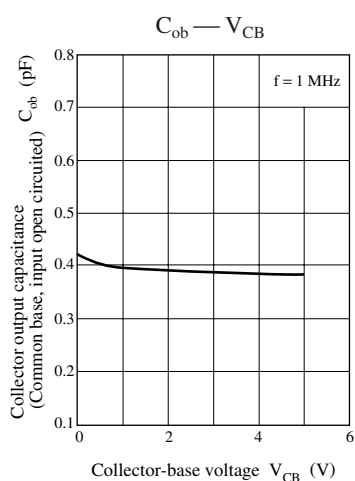
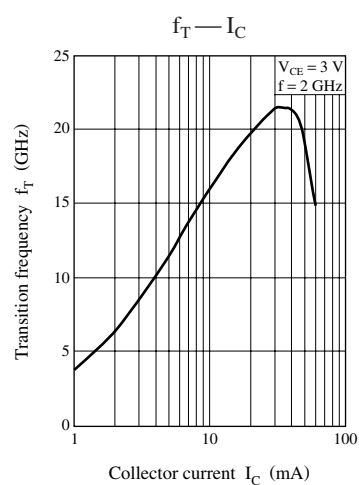
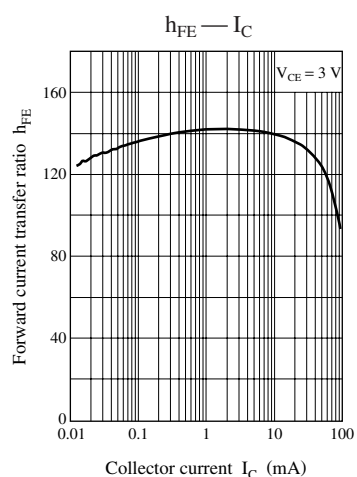
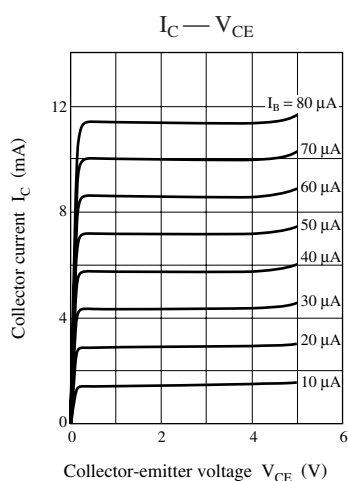
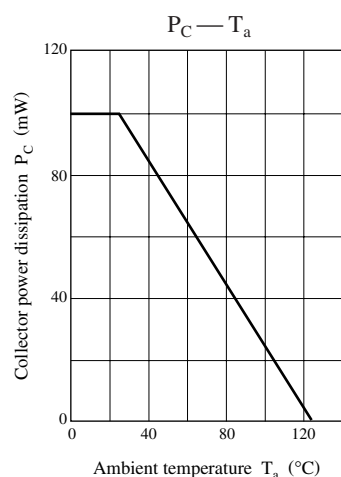
### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

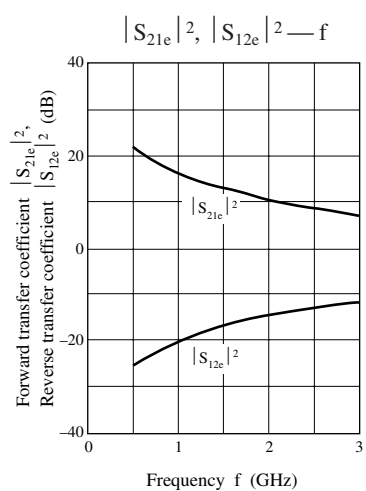
| Parameter                                                           | Symbol        | Conditions                                                  | Min | Typ  | Max | Unit          |
|---------------------------------------------------------------------|---------------|-------------------------------------------------------------|-----|------|-----|---------------|
| Collector-base cutoff current (Emitter open)                        | $I_{CBO}$     | $V_{CB} = 9\text{ V}, I_E = 0$                              |     |      | 1   | $\mu\text{A}$ |
| Collector-emitter cutoff current (Base open)                        | $I_{CEO}$     | $V_{CE} = 6\text{ V}, I_B = 0$                              |     |      | 1   | $\mu\text{A}$ |
| Emitter-base cutoff current (Collector open)                        | $I_{EBO}$     | $V_{EB} = 1\text{ V}, I_C = 0$                              |     |      | 1   | $\mu\text{A}$ |
| Forward current transfer ratio                                      | $h_{FE}$      | $V_{CE} = 3\text{ V}, I_C = 6\text{ mA}$                    | 100 |      | 220 | —             |
| Transition frequency                                                | $f_T$         | $V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 2\text{ GHz}$ |     | 19   |     | GHz           |
| Forward transfer gain                                               | $ S_{21e} ^2$ | $V_{CE} = 3\text{ V}, I_C = 20\text{ mA}, f = 2\text{ GHz}$ | 7.5 | 10.5 |     | dB            |
| Noise figure                                                        | NF            | $V_{CE} = 3\text{ V}, I_C = 6\text{ mA}, f = 2\text{ GHz}$  |     | 1.4  | 2.0 | dB            |
| Collector output capacitance<br>(Common base, input open circuited) | $C_{ob}$      | $V_{CB} = 3\text{ V}, I_E = 0, f = 1\text{ MHz}$            |     | 0.4  | 0.7 | pF            |

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.



Marking Symbol: 5T





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