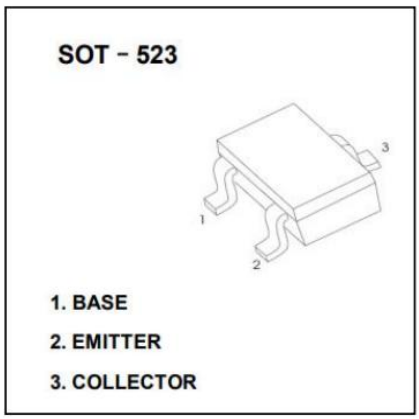
# NPN Silicon Epitaxial Planar Transistor

for microwave low noise amplifier at VHF, UHF and CATV band

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

| HFE | MARKING |
|---|---|
| Q | R23 |
| R | R24 |
| S | R25 |



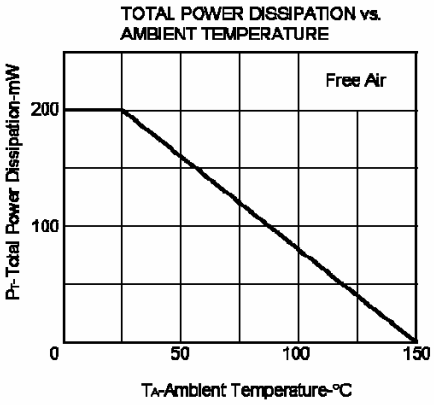

## Absolute Maximum Ratings ($T_a$ = 25 °C)

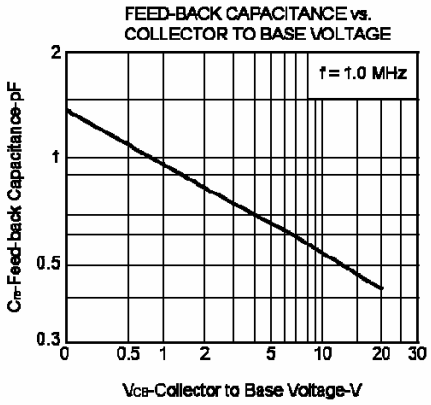
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector Base Voltage | $V_{CBO}$ | 20 | V |
| Collector Emitter Voltage | $V_{CEO}$ | 12 | V |
| Emitter Base Voltage | $V_{EBO}$ | 3 | V |
| Collector Current | $I_C$ | 100 | mA |
| Power Dissipation | $P_{tot}$ | 200 | mW |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature Range | $T_S$ | - 65 to + 150 | °C |

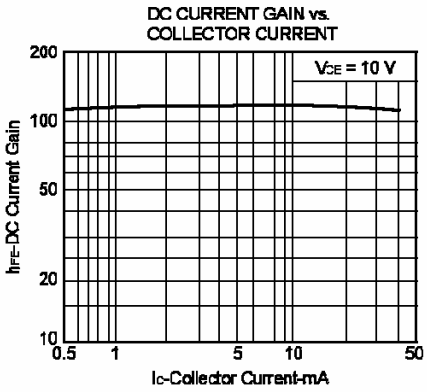
## Characteristics ($T_a$ = 25 °C)

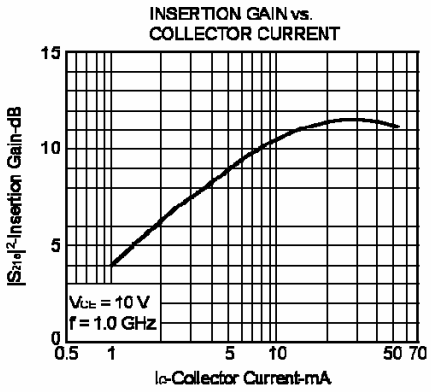
| Parameter | | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| DC Current Gain at $V_{CE}$ = 10 V, $I_C$ = 20 mA | Current Gain Group Q | $h_{FE}$ | 50 | - | 100 | - |
| | R | $h_{FE}$ | 80 | - | 160 | - |
| | S | $h_{FE}$ | 125 | - | 250 | - |
| Collector Cutoff Current at $V_{CB}$ = 10 V | | $I_{CBO}$ | - | - | 1 | μA |
| Emitter Cutoff Current at $V_{EB}$ = 1 V | | $I_{EBO}$ | - | - | 1 | μA |
| Gain Bandwidth Product at $V_{CE}$ = 10 V, $I_C$ = 20 mA | | $f_T$ | - | 3 | - | GHz |
| Feed-Back Capacitance at $V_{CB}$ = 10 V, f = 1 MHz | | $C_{re}$ 1) | - | 0.55 | 1 | pF |
| Noise Figure at $V_{CE}$ = 10 V, $I_C$ = 7 mA, f = 1 GHz | | NF | - | 1.1 | 2 | dB |

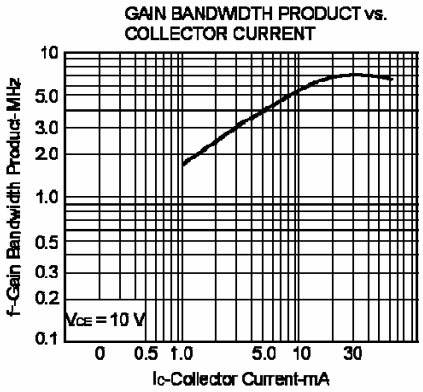
1) The emitter terminal and the case shall be connected to the guard terminal of the three-terminal capacitance bridge.

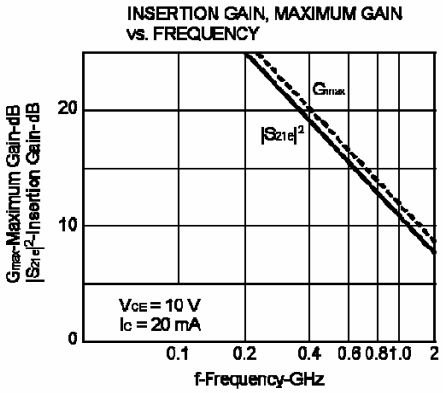


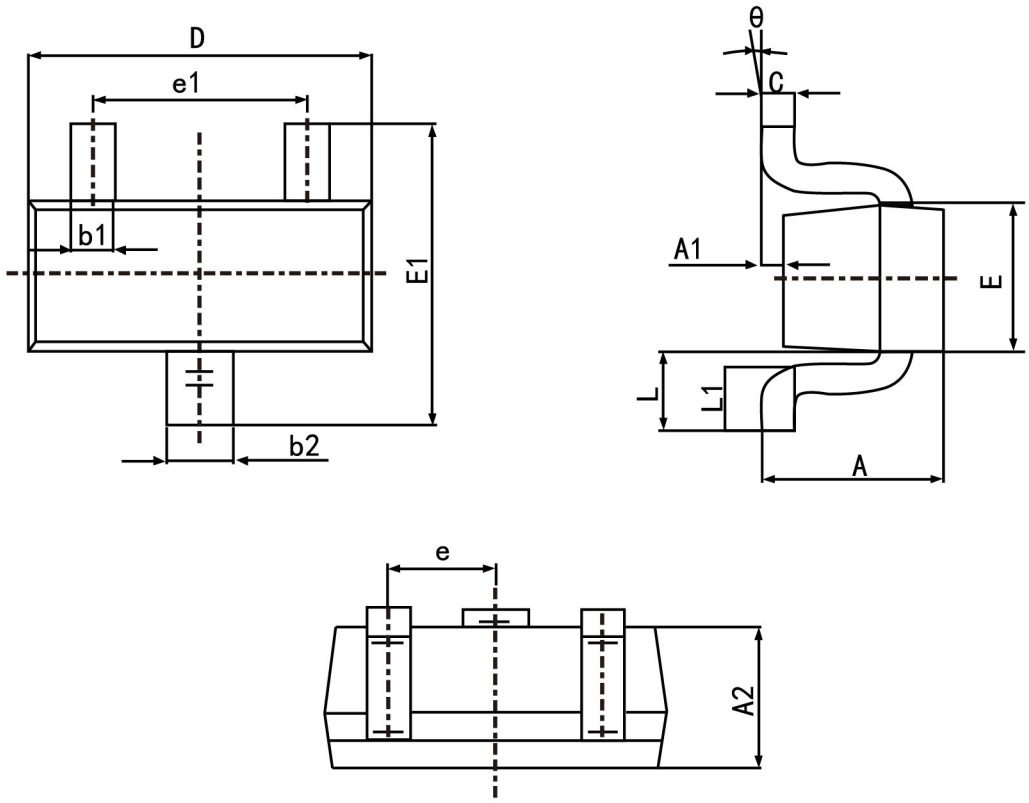



## PACKAGE OUTLINE

**Plastic surface mounted package; 3 leads** **SOT-523**




| Symbol | Dimension in Millimeters | |
|---|---|---|
| | Min | Max |
| A | 0.700 | 0.900 |
| A1 | 0.000 | 0.100 |
| A2 | 0.700 | 0.800 |
| b1 | 0.150 | 0.250 |
| b2 | 0.250 | 0.350 |
| c | 0.100 | 0.200 |
| D | 1.500 | 1.700 |
| E | 0.700 | 0.900 |
| E1 | 1.450 | 1.750 |
| e | 0.500 | TYP. |
| e1 | 0.900 | 1.100 |
| L | 0.400 REF. | |
| L1 | 0.260 | 0.460 |
| θ | 0° | 8° |