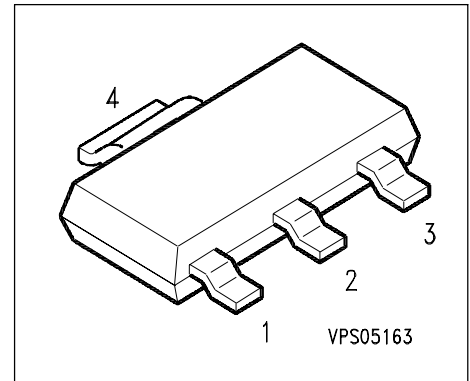


PNP Silicon RF Transistor

- For low distortion broadband amplifiers in antenna and telecommunications systems up to 1.5 GHz at collector currents from 20mA to 80mA



ESD: Electrostatic discharge sensitive device, observe handling precaution!

| Type | Marking | Ordering Code | Pin Configuration | | | | Package |
|---------|---------|---------------|-------------------|-------|-------|-------|---------|
| BFG 194 | BFG194 | Q62702-F1321 | 1 = E | 2 = B | 3 = E | 4 = C | SOT-223 |

Maximum Ratings

| Parameter | Symbol | Values | Unit |
|--|-----------|----------------|------|
| Collector-emitter voltage | V_{CEO} | 15 | V |
| Collector-base voltage | V_{CBO} | 20 | |
| Emitter-base voltage | V_{EBO} | 3 | |
| Collector current | I_C | 100 | mA |
| Base current | I_B | 10 | |
| Total power dissipation $T_S \leq 75^\circ\text{C}$ | P_{tot} | 1000 | mW |
| Junction temperature | T_j | 150 | °C |
| Ambient temperature | T_A | - 65 ... + 150 | |
| Storage temperature | T_{stg} | - 65 ... + 150 | |

Thermal Resistance

| | | | |
|--|------------|-----------|-----|
| Junction - soldering point ¹⁾ | R_{thJS} | ≤ 75 | K/W |
|--|------------|-----------|-----|

1) T_S is measured on the collector lead at the soldering point to the pcb.

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|--|---------------|--------|------|------|---------------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$ | $V_{(BR)CEO}$ | 15 | - | - | V |
| Collector-base cutoff current $V_{CB} = 10 \text{ V}, I_E = 0$ | I_{CBO} | - | - | 100 | nA |
| Emitter-base cutoff current $V_{EB} = 2 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 1 | μA |
| DC current gain $I_C = 70 \text{ mA}, V_{CE} = 8 \text{ V}$ | h_{FE} | 15 | 50 | - | - |

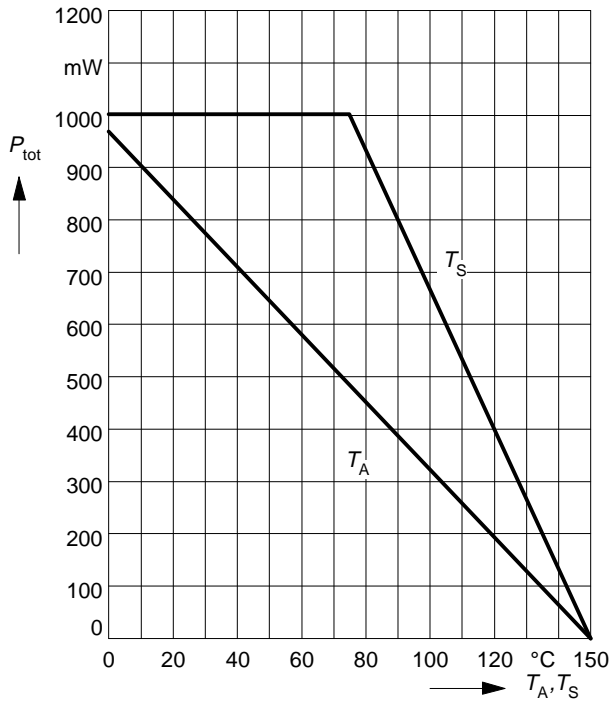
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|---|-----------------|--------|------------|------|------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 70 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $f = 500 \text{ MHz}$ | f_T | 3.5 | 5 | - | GHz |
| Collector-base capacitance $V_{CB} = 10 \text{ V}$, $V_{BE} = v_{be} = 0$, $f = 1 \text{ MHz}$ | C_{cb} | - | 1.4 | 2 | pF |
| Collector-emitter capacitance $V_{CE} = 10 \text{ V}$, $V_{BE} = v_{be} = 0$, $f = 1 \text{ MHz}$ | C_{ce} | - | 0.4 | - | |
| Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$, $V_{CB} = v_{cb} = 0$, $f = 1 \text{ MHz}$ | C_{eb} | - | 4.7 | - | |
| Noise figure $I_C = 20 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{\text{Sopt}}$ $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$ | F | - | 2.8 4.7 | - | dB |
| Power gain ²⁾ $I_C = 70 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{\text{Sopt}}$ $Z_L = Z_{\text{Lopt}}$ $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$ | G_{ma} | - | 11 6.5 | - | |
| Transducer gain $I_C = 70 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = 50 \Omega$ $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$ | $ S_{21e} ^2$ | - | 8 3 | - | |

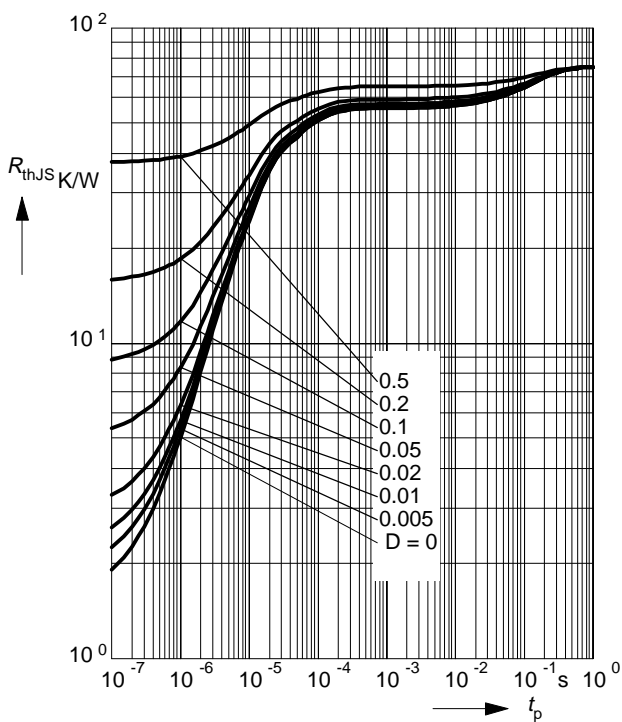
2) $G_{\text{ma}} = |S_{21}/S_{12}| (k - (k^2 - 1)^{1/2})$

Total power dissipation $P_{tot} = f(T_A^*, T_S)$

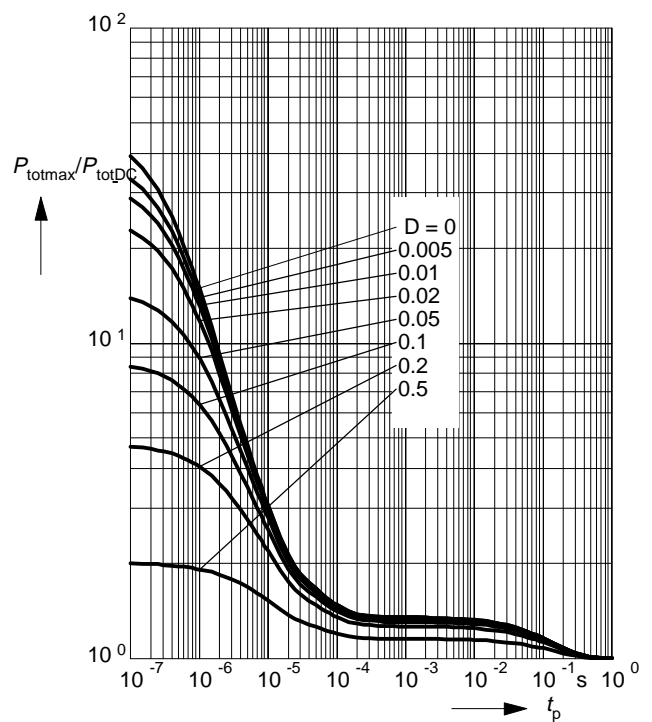
* Package mounted on epoxy



Permissible Pulse Load $R_{thJS} = f(t_p)$

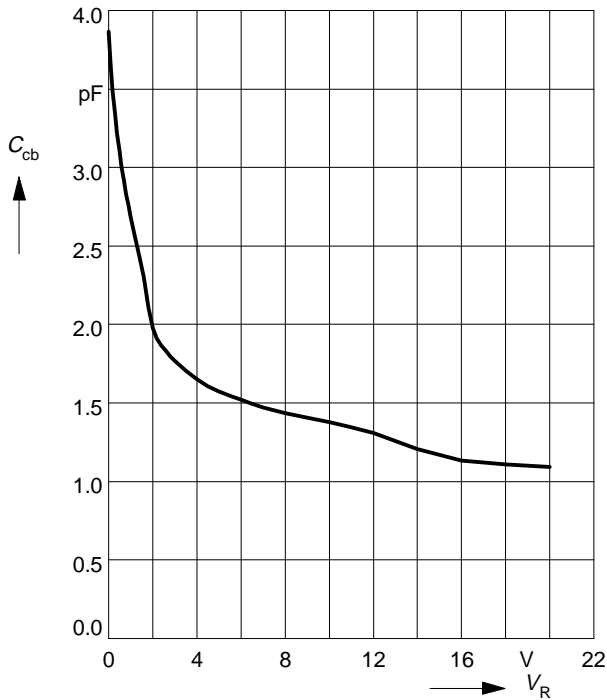


Permissible Pulse Load $P_{totmax}/P_{totDC} = f(t_p)$



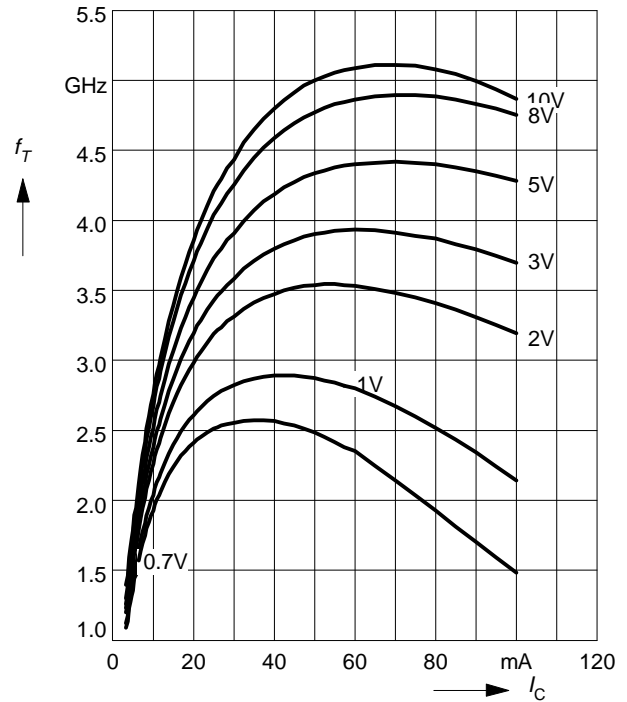
Collector-base capacitance $C_{cb} = f(V_{CB})$

$V_{BE} = v_{be} = 0, f = 1\text{MHz}$



Transition frequency $f_T = f(I_C)$

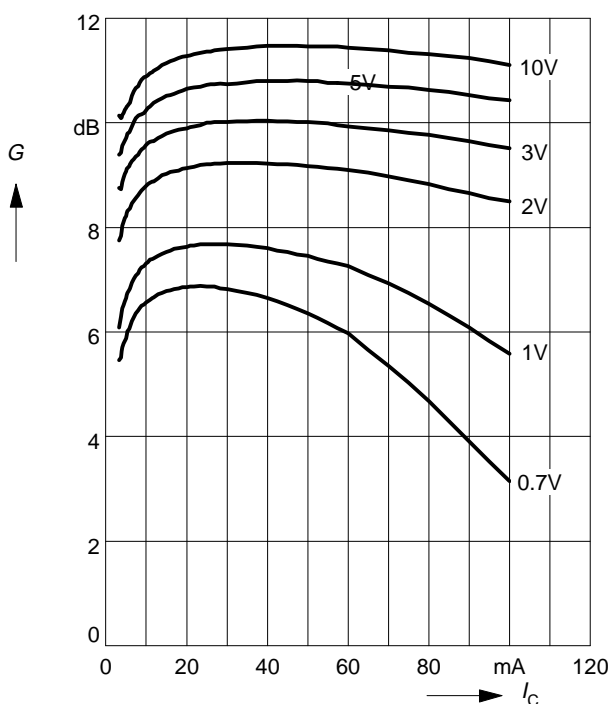
$V_{CE} = \text{Parameter}$



Power Gain $G_{ma}, G_{ms} = f(I_C)$

$f = 0.9\text{GHz}$

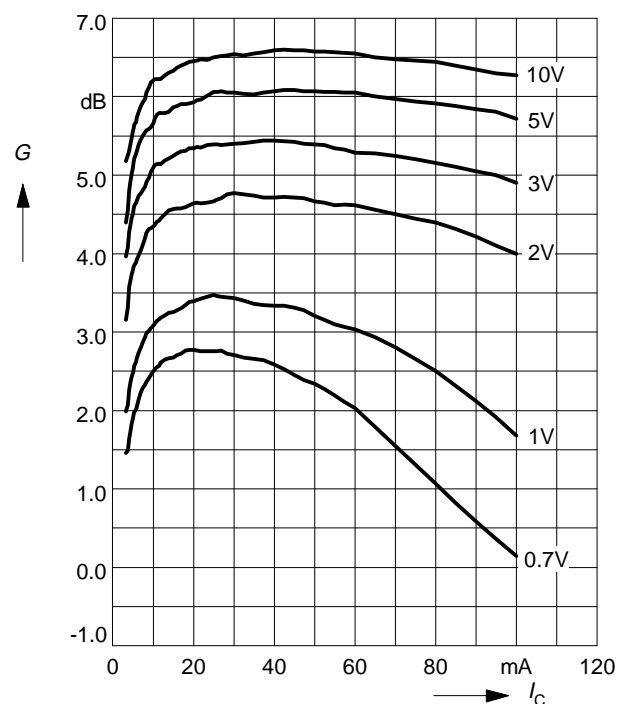
$V_{CE} = \text{Parameter}$



Power Gain $G_{ma}, G_{ms} = f(I_C)$

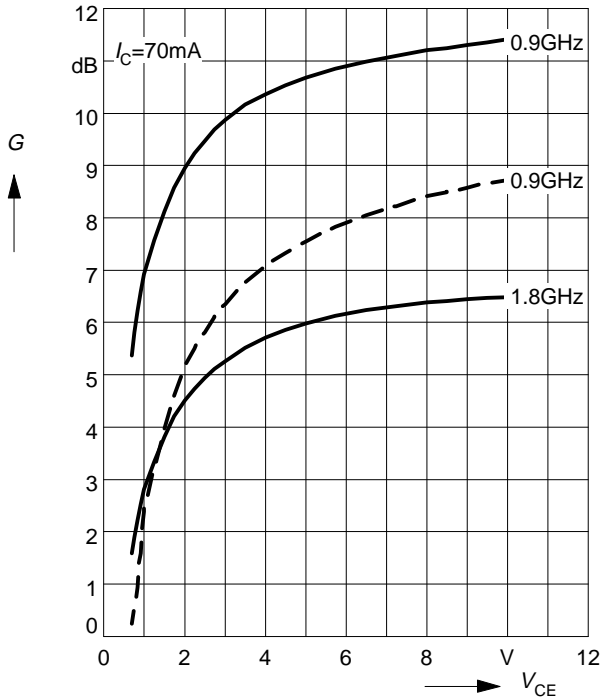
$f = 1.8\text{GHz}$

$V_{CE} = \text{Parameter}$



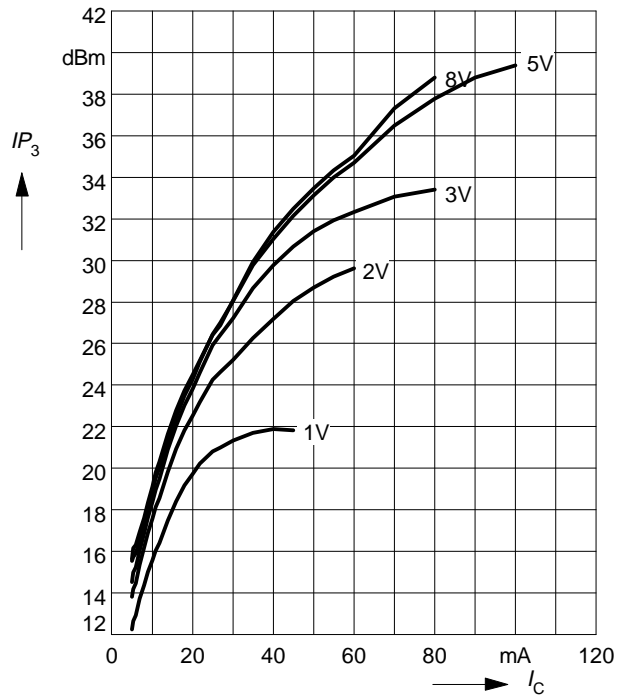
Power Gain $G_{ma}, G_{ms} = f(V_{CE})$: _____
 $|S_{21}|^2 = f(V_{CE})$: - - - - -

$f =$ Parameter



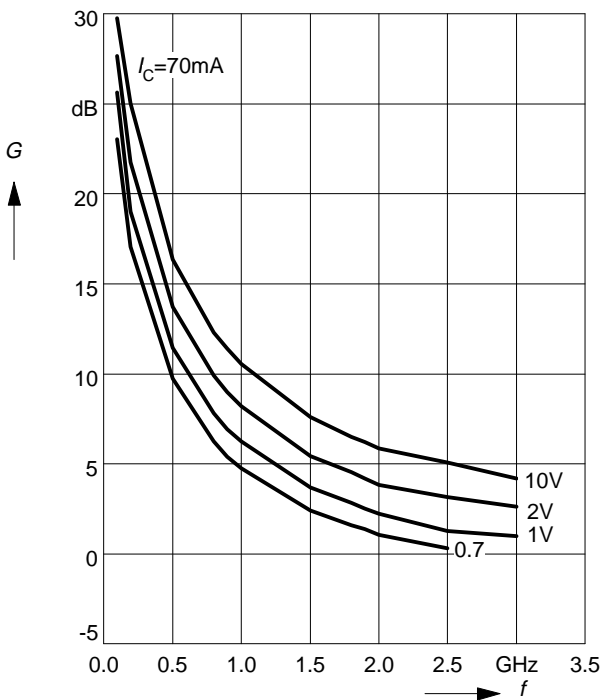
Intermodulation Intercept Point $IP_3 = f(I_C)$
 (3rd order, Output, $Z_S = Z_L = 50\Omega$)

$V_{CE} =$ Parameter, $f = 900\text{MHz}$



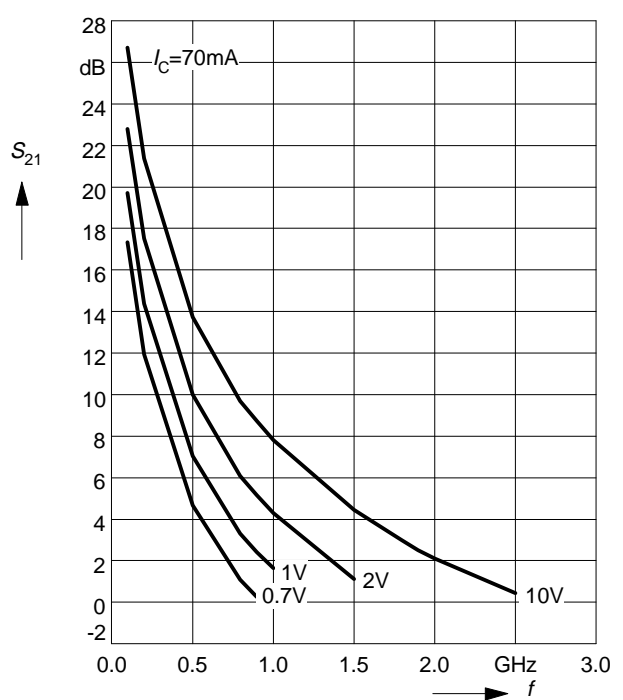
Power Gain $G_{ma}, G_{ms} = f(f)$

$V_{CE} =$ Parameter



Power Gain $|S_{21}|^2 = f(f)$

$V_{CE} =$ Parameter



Package

