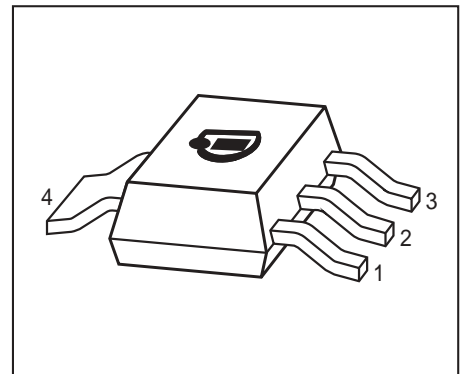


NPN Silicon RF Transistor*

- For low noise, low distortion broadband amplifiers in antenna and telecommunications systems up to 1.5 GHz at collector currents from 20 mA to 80 mA
- Power amplifier for DECT and PCN systems
- $f_T = 7.5$ GHz, $F = 1.3$ dB at 900 MHz
- Pb-free (RoHS compliant) package¹⁾
- Qualified according AEC Q101



* Short term description



ESD (Electrostatic discharge) sensitive device, observe handling precaution!

| Type | Marking | Pin Configuration | | | | | | Package |
|--------|---------|-------------------|-------|-------|-------|---|---|---------|
| BFG196 | BFG196 | 1 = E | 2 = B | 3 = E | 4 = C | - | - | SOT223 |

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|--|-----------|-------------|------------------|
| Collector-emitter voltage | V_{CEO} | 12 | V |
| Collector-emitter voltage | V_{CES} | 20 | |
| Collector-base voltage | V_{CBO} | 20 | |
| Emitter-base voltage | V_{EBO} | 2 | |
| Collector current | I_C | 150 | mA |
| Base current | I_B | 15 | |
| Total power dissipation ²⁾ $T_S \leq 90^\circ\text{C}$ | P_{tot} | 800 | mW |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Ambient temperature | T_A | -65 ... 150 | |
| Storage temperature | T_{stg} | -65 ... 150 | |

Thermal Resistance

| Parameter | Symbol | Value | Unit |
|--|------------|-----------|------|
| Junction - soldering point ³⁾ | R_{thJS} | ≤ 75 | K/W |

¹Pb-containing package may be available upon special request

² T_S is measured on the collector lead at the soldering point to the pcb

³For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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 $I_C = 1 \text{ mA}, I_B = 0$ | $V_{(BR)CEO}$ | 12 | - | - | V |
| Collector-emitter cutoff current $V_{CE} = 20 \text{ V}, V_{BE} = 0$ | I_{CES} | - | - | 100 | μA |
| Collector-base cutoff current $V_{CB} = 10 \text{ V}, I_E = 0$ | I_{CBO} | - | - | 100 | nA |
| Emitter-base cutoff current $V_{EB} = 1 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 1 | μA |
| DC current gain- $I_C = 50 \text{ mA}, V_{CE} = 8 \text{ V}, \text{ pulse measured}$ | h_{FE} | 70 | 100 | 140 | - |

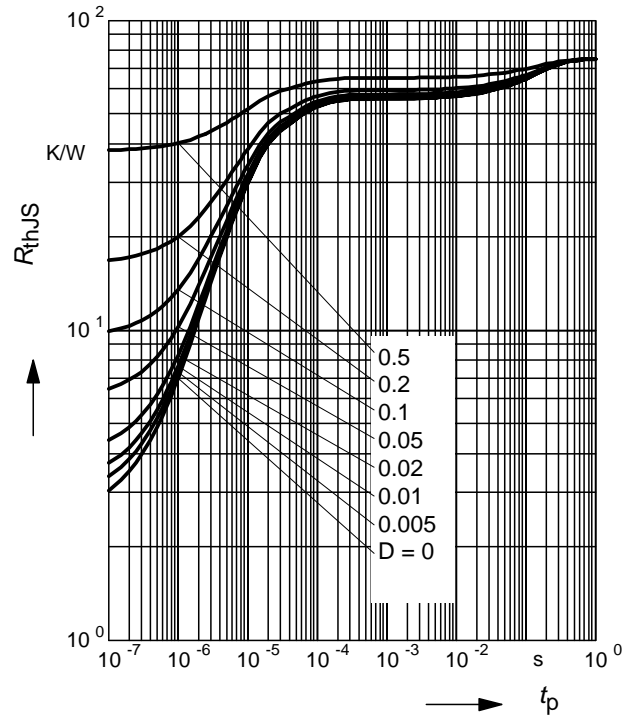
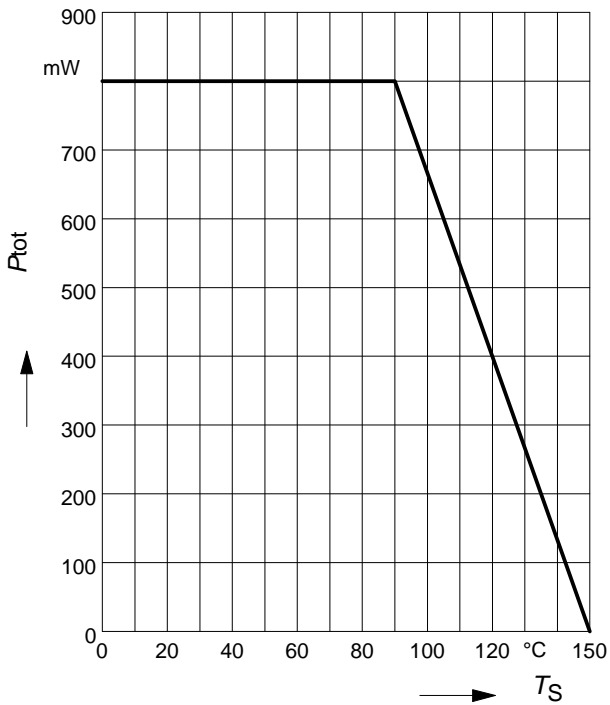
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---------------|--------|------|------|------|
| | | min. | typ. | max. | |
| AC Characteristics (verified by random sampling) | | | | | |
| Transition frequency $I_C = 70 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $f = 500 \text{ MHz}$ | f_T | 5 | 7.5 | - | GHz |
| Collector-base capacitance $V_{CB} = 10 \text{ V}$, $f = 1 \text{ MHz}$, $V_{BE} = 0$, emitter grounded | C_{cb} | - | 0.85 | 1.3 | pF |
| Collector emitter capacitance $V_{CE} = 10 \text{ V}$, $f = 1 \text{ MHz}$, $V_{BE} = 0$, base grounded | C_{ce} | - | 0.45 | - | |
| Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$, $f = 1 \text{ MHz}$, $V_{CB} = 0$, collector grounded | C_{eb} | - | 4.2 | - | |
| Noise figure $I_C = 20 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $f = 900 \text{ MHz}$ $I_C = 20 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $f = 1.8 \text{ GHz}$ | F | - | 1.3 | - | dB |
| | | - | 2.3 | - | |
| Power gain, maximum available ¹⁾ $I_C = 50 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 900 \text{ MHz}$ $I_C = 50 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 1.8 \text{ GHz}$ | G_{ma} | - | 14.5 | - | |
| | | - | 9 | - | |
| Transducer gain $I_C = 50 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_L = 50\Omega$, $f = 900 \text{ MHz}$ $I_C = 50 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_L = 50\Omega$, $f = 1.8 \text{ GHz}$ | $ S_{21e} ^2$ | - | 12 | - | dB |
| | | - | 6.5 | - | |

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

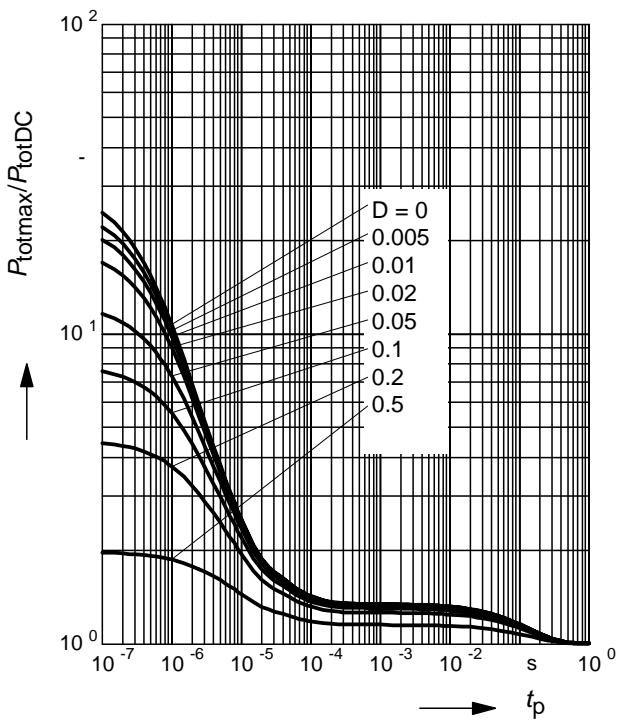
Total power dissipation $P_{tot} = f(T_S)$

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

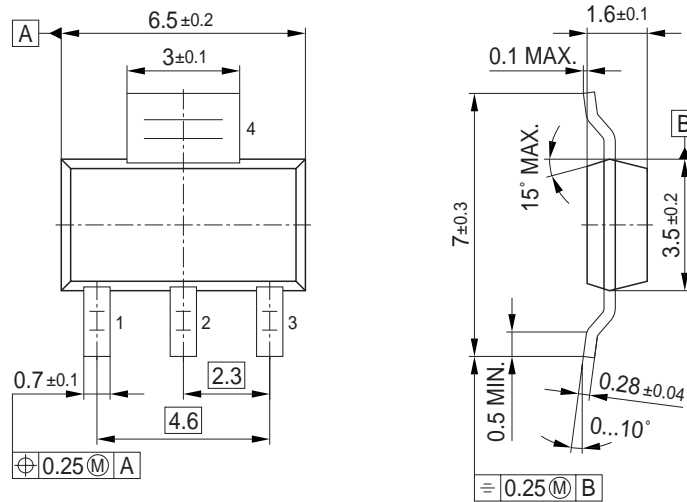


Permissible Pulse Load

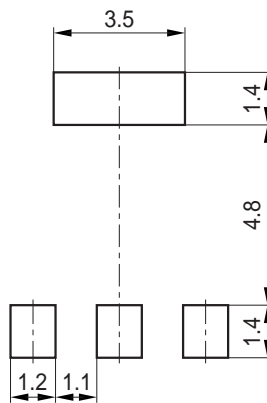
$P_{totmax}/P_{totDC} = f(t_p)$



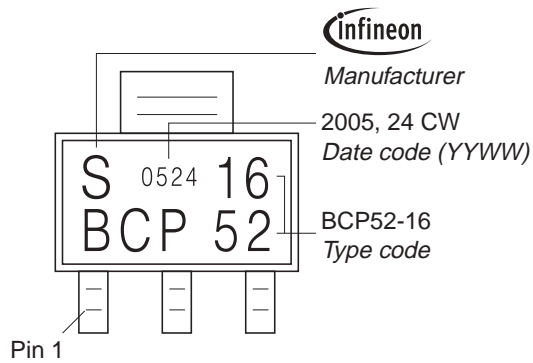
Package Outline



Foot Print

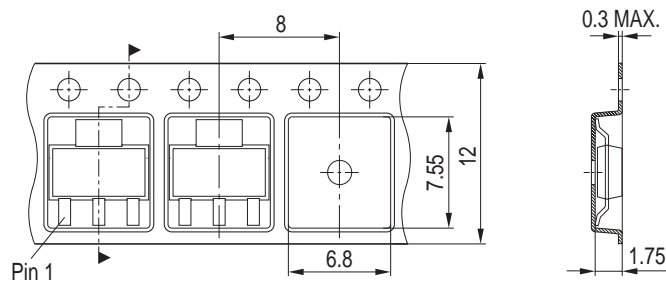


Marking Layout (Example)



Packing

Reel $\varnothing 180 \text{ mm}$ = 1.000 Pieces/Reel
 Reel $\varnothing 330 \text{ mm}$ = 4.000 Pieces/Reel



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