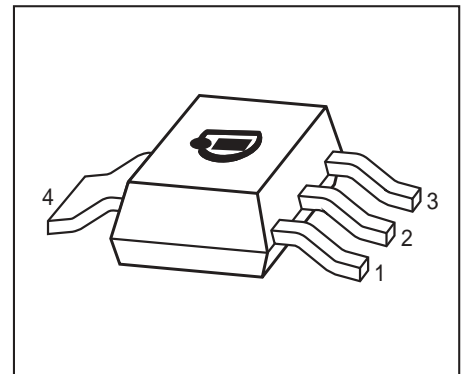


**NPN Silicon RF Transistor\***

- For low-distortion broadband output amplifier stages in antenna and telecommunication systems up to 2 GHz at collector currents from 120 mA to 250 mA
- Power amplifiers for DECT and PCN systems
- Integrated emitter ballast resistor
- $f_T = 5.5$  GHz
- Pb-free (RoHS compliant) package<sup>1)</sup>
- Qualified according AEC Q101

\* Short term description



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

| Type   | Marking | Pin Configuration |       |       |       |   |   | Package |
|--------|---------|-------------------|-------|-------|-------|---|---|---------|
| BFG235 | BFG235  | 1 = E             | 2 = B | 3 = E | 4 = C | - | - | SOT223  |

**Maximum Ratings**

| Parameter  | Symbol    | Value       | Unit             |
|--|-----------|-------------|------------------|
| Collector-emitter voltage  | $V_{CEO}$ | 15          | V                |
| Collector-emitter voltage  | $V_{CES}$ | 25          |                  |
| Collector-base voltage   | $V_{CBO}$ | 25          |                  |
| Emitter-base voltage   | $V_{EBO}$ | 2           |                  |
| Collector current  | $I_C$     | 300         | mA               |
| Base current   | $I_B$     | 40          |                  |
| Total power dissipation <sup>2)</sup><br>$T_S \leq 80^\circ\text{C}$ | $P_{tot}$ | 2           | W                |
| Junction temperature   | $T_j$     | 150         | $^\circ\text{C}$ |
| Ambient temperature  | $T_A$     | -65 ... 150 |                  |
| Storage temperature  | $T_{stg}$ | -65 ... 150 |                  |

<sup>1)</sup>Pb-containing package may be available upon special request

<sup>2)</sup> $T_S$  is measured on the collector lead at the soldering point to the pcb

**Thermal Resistance**

| Parameter                                | Symbol     | Value | Unit |
|--|------------|-------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | ≤ 35  | K/W  |

**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<br>$I_C = 1 \text{ mA}, I_B = 0$              | $V_{(BR)CEO}$ | 15 | -   | -   | V             |
| Collector-emitter cutoff current<br>$V_{CE} = 25 \text{ V}, V_{BE} = 0$           | $I_{CES}$     | -  | -   | 200 | $\mu\text{A}$ |
| Collector-base cutoff current<br>$V_{CB} = 10 \text{ V}, I_E = 0$                 | $I_{CBO}$     | -  | -   | 100 | nA            |
| Emitter-base cutoff current<br>$V_{EB} = 1 \text{ V}, I_C = 0$                    | $I_{EBO}$     | -  | -   | 2   | $\mu\text{A}$ |
| DC current gain-<br>$I_C = 200 \text{ mA}, V_{CE} = 8 \text{ V}$ , pulse measured | $h_{FE}$      | 75 | 120 | 160 | -             |

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

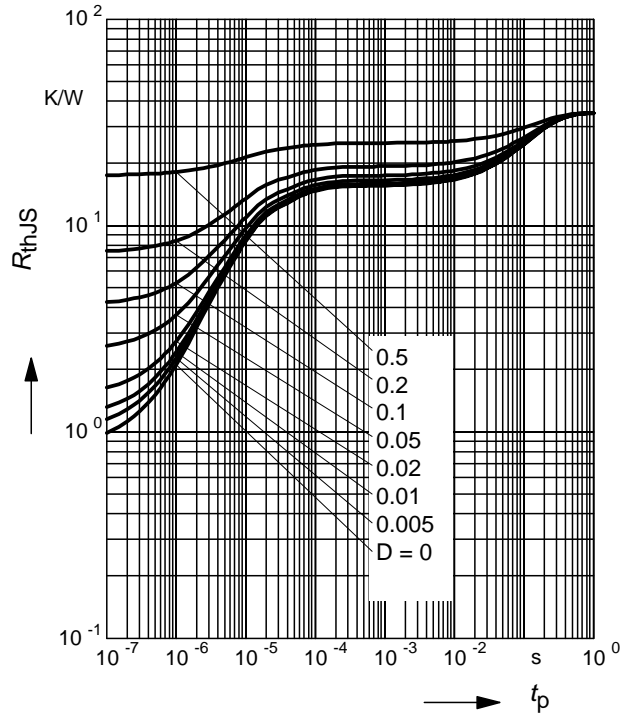
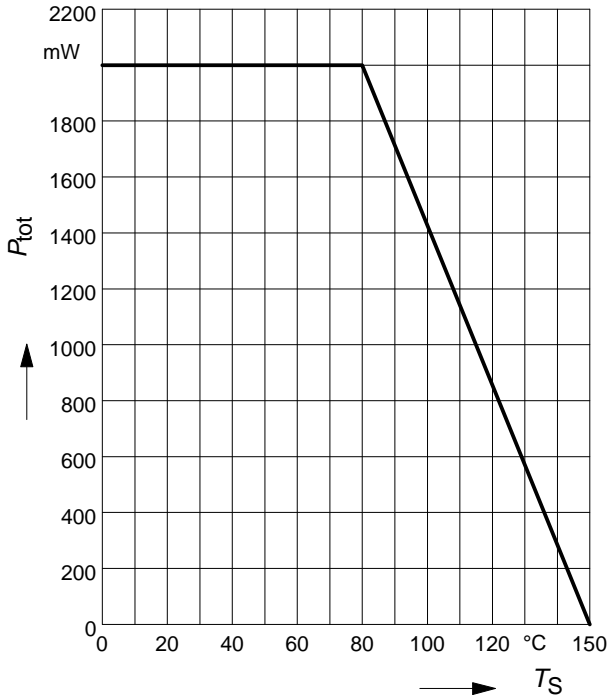
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

| Parameter  | Symbol        | Values |      |      | Unit |
|--|---------------|--------|------|------|------|
|  |               | min.   | typ. | max. |      |
| <b>AC Characteristics (verified by random sampling)</b>  |               |        |      |      |      |
| Transition frequency<br>$I_C = 200\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $f = 200\text{ MHz}$   | $f_T$         | 4      | 5.5  | -    | GHz  |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ ,<br>emitter grounded   | $C_{cb}$      | -      | 2.2  | 3    | pF   |
| Collector emitter capacitance<br>$V_{CE} = 10\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ ,<br>base grounded   | $C_{ce}$      | -      | 1.5  | -    |      |
| Emitter-base capacitance<br>$V_{EB} = 0.5\text{ V}$ , $f = 1\text{ MHz}$ , $V_{CB} = 0$ ,<br>collector grounded  | $C_{eb}$      | -      | 14   | -    |      |
| Noise figure<br>$I_C = 60\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_{Sopt}$ ,<br>$f = 900\text{ MHz}$  | $F$           | -      | 1.7  | -    | dB   |
| Power gain, maximum available <sup>1)</sup><br>$I_C = 200\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_{Sopt}$ ,<br>$Z_L = Z_{Lopt}$ , $f = 900\text{ MHz}$ | $G_{ma}$      | -      | 12.5 | -    |      |
| Transducer gain<br>$I_C = 200\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_L = 50\Omega$ ,<br>$f = 900\text{ MHz}$  | $ S_{21e} ^2$ | -      | 6.5  | -    | dB   |
| Third order intercept point at output<br>$V_{CE} = 8\text{ V}$ , $I_C = 200\text{ mA}$ , $f = 900\text{ MHz}$ ,<br>$Z_S = Z_L = 50\Omega$                    | $IP_3$        | -      | 33   | -    | dBm  |

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

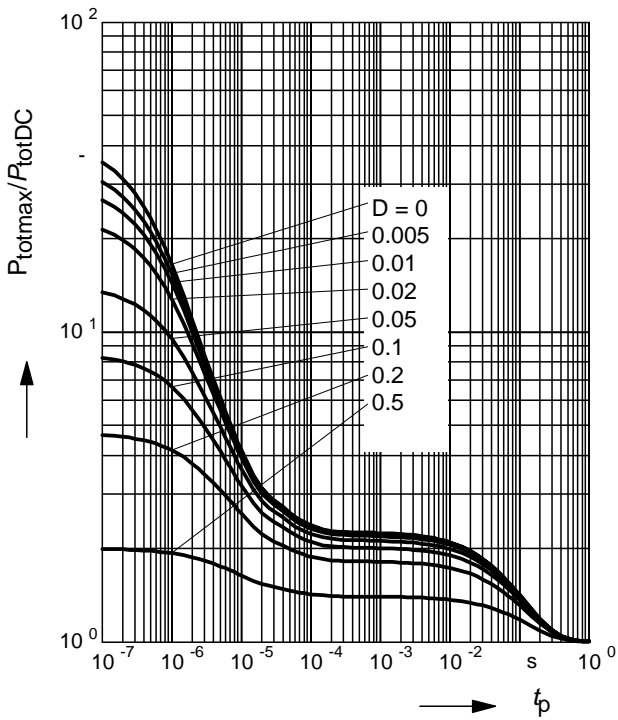
Total power dissipation  $P_{tot} = f(T_S)$

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

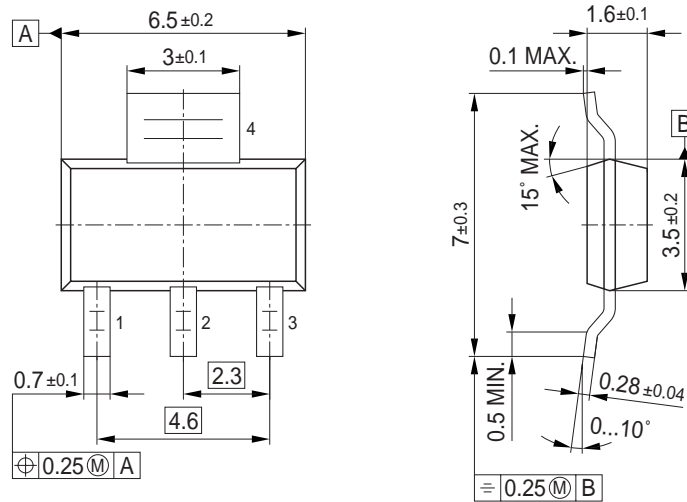


**Permissible Pulse Load**

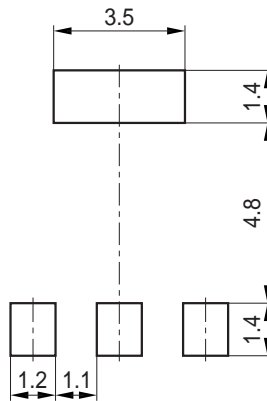
$P_{totmax}/P_{totDC} = f(t_p)$



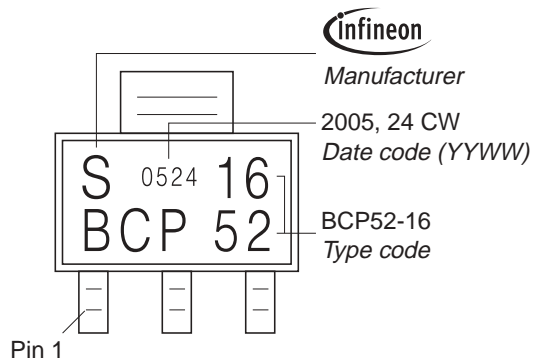
Package Outline



Foot Print

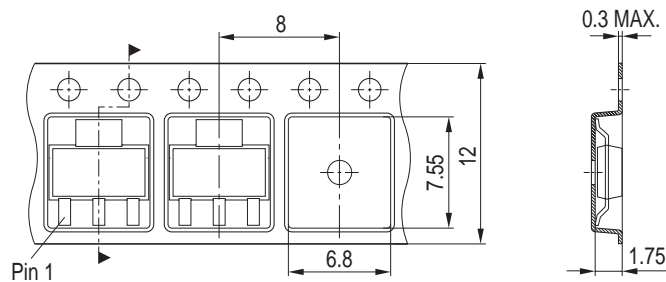


Marking Layout (Example)



Packing

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



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