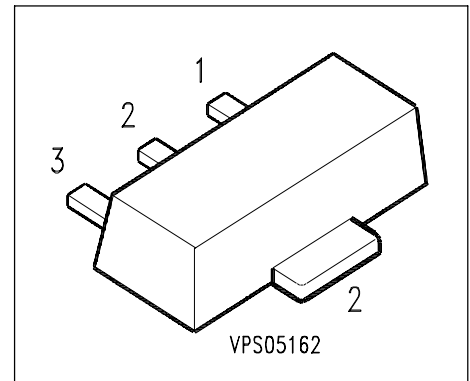


### NPN Silicon RF Transistor

- For low noise, low distortion broadband amplifiers in antenna and telecommunications systems up to 1.5GHz at collector currents from 10 mA to 70 mA
- CECC-type available: CECC 50 002/259



**ESD:** Electrostatic discharge sensitive device, observe handling precaution!

| Type    | Marking | Ordering Code | Pin Configuration |       |       | Package |
|---------|---------|---------------|-------------------|-------|-------|---------|
| BFQ 19S | FGs     | Q62702-F1088  | 1 = B             | 2 = C | 3 = E | SOT-89  |

### 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                                      | $I_C$     | 75             | mA               |
| Base current                                           | $I_B$     | 12             |                  |
| Total power dissipation<br>$T_S \leq 85^\circ\text{C}$ | $P_{tot}$ | 1              | W                |
| Junction temperature                                   | $T_j$     | 150            | $^\circ\text{C}$ |
| Ambient temperature                                    | $T_A$     | - 65 ... + 150 |                  |
| Storage temperature                                    | $T_{stg}$ | - 65 ... + 150 |                  |

### Thermal Resistance

|                                          |            |           |     |
|------------------------------------------|------------|-----------|-----|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | $\leq 65$ | K/W |
|------------------------------------------|------------|-----------|-----|

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

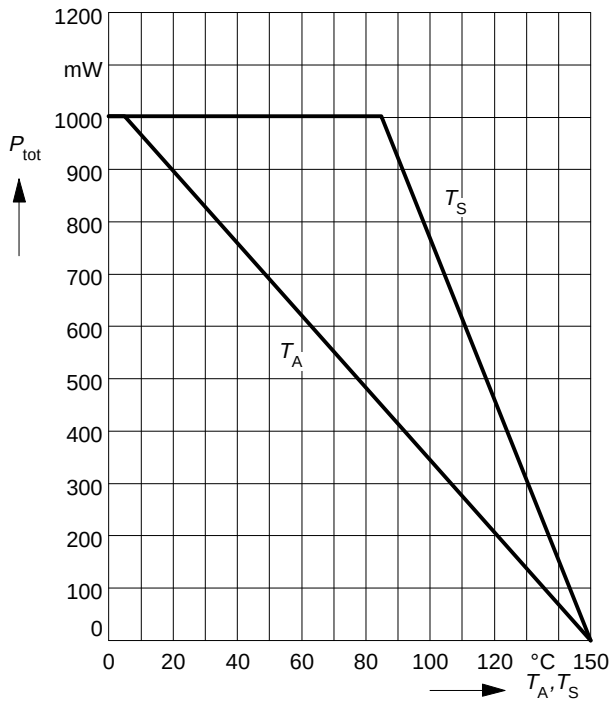
| Parameter                                                                 | Symbol        | Values |      |      | Unit          |
|---------------------------------------------------------------------------|---------------|--------|------|------|---------------|
|                                                                           |               | 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>$V_{CE} = 20\text{ V}$ , $V_{BE} = 0$ | $I_{CES}$     | -      | -    | 100  | $\mu\text{A}$ |
| Collector-base cutoff current<br>$V_{CB} = 10\text{ V}$ , $I_E = 0$       | $I_{CBO}$     | -      | -    | 100  | nA            |
| Emitter-base cutoff current<br>$V_{EB} = 2\text{ V}$ , $I_C = 0$          | $I_{EBO}$     | -      | -    | 10   | $\mu\text{A}$ |
| DC current gain<br>$I_C = 70\text{ mA}$ , $V_{CE} = 8\text{ V}$           | $h_{FE}$      | 40     | 100  | 220  | -             |

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

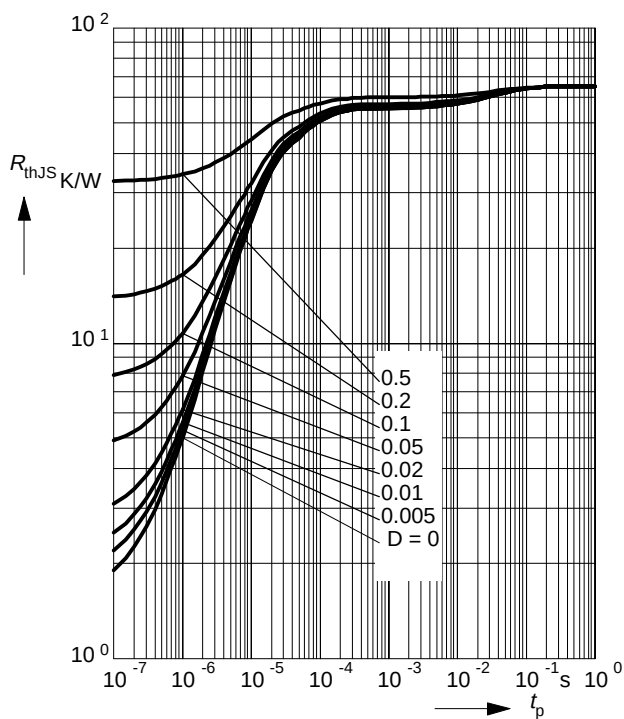
| Parameter                                                                                                                                            | Symbol        | Values |           |        | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|-----------|--------|------|
|                                                                                                                                                      |               | min.   | typ.      | max.   |      |
| AC Characteristics                                                                                                                                   |               |        |           |        |      |
| Transition frequency<br>$I_C = 70\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $f = 500\text{ MHz}$                                                          | $f_T$         | 4      | 5.5       | -      | GHz  |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                                                                            | $C_{cb}$      | -      | 1         | 1.5    | pF   |
| Collector-emitter capacitance<br>$V_{CE} = 10\text{ V}$ , $f = 1\text{ MHz}$                                                                         | $C_{ce}$      | -      | 0.4       | -      |      |
| Emitter-base capacitance<br>$V_{EB} = 0.5\text{ V}$ , $f = 1\text{ MHz}$                                                                             | $C_{eb}$      | -      | 4.4       | -      |      |
| Noise figure<br>$I_C = 20\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_{Sopt}$<br>$f = 900\text{ MHz}$<br>$f = 1.8\text{ GHz}$                      | $F$           | -<br>- | 2.5<br>4  | -<br>- | dB   |
| Power gain 2)<br>$I_C = 70\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_{Sopt}$<br>$Z_L = Z_{Lopt}$<br>$f = 900\text{ MHz}$<br>$f = 1.8\text{ GHz}$ | $G_{ma}$      | -<br>- | 11.5<br>7 | -<br>- |      |
| Transducer gain<br>$I_C = 30\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_L = 50\text{ }\Omega$<br>$f = 900\text{ MHz}$<br>$f = 1.8\text{ GHz}$     | $ S_{21e} ^2$ | -<br>- | 9.5<br>4  | -<br>- |      |
| Third order intercept point<br>$I_C = 70\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $f = 900\text{ MHz}$<br>$Z_S = Z_L = 50\text{ }\Omega$                 | $IP_3$        | -      | 35        | -      | dBm  |

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

\* Package mounted on epoxy



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



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

