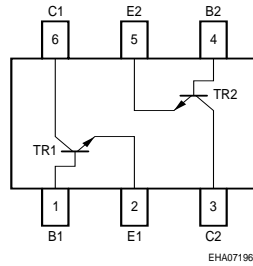
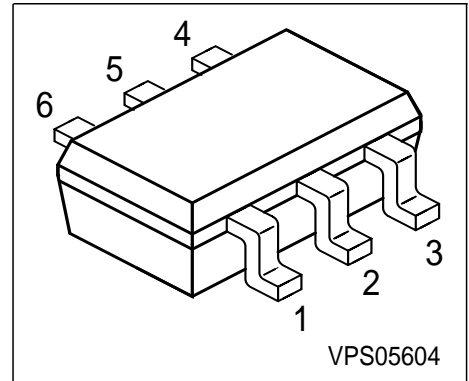


NPN Silicon RF Transistor

- For broadband amplifiers up to 1 GHz at collector currents from 1 mA to 20 mA



| Type | Marking | Pin Configuration | | | | | Package | |
|--------|---------|-------------------|------|------|------|------|---------|--------|
| BFS17S | MCs | 1=B1 | 2=E1 | 3=C2 | 4=B2 | 5=E2 | 6=C1 | SOT363 |

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|-----------|-------------|------|
| Collector-emitter voltage | V_{CEO} | 15 | V |
| Collector-base voltage | V_{CBO} | 25 | |
| Emitter-base voltage | V_{EBO} | 2.5 | |
| Collector current | I_C | 25 | mA |
| Peak collector current, $f = 10$ MHz | I_{CM} | 50 | |
| Total power dissipation $T_S \leq 93$ °C ¹⁾ | P_{tot} | 280 | mW |
| Junction temperature | T_j | 150 | °C |
| Ambient temperature | T_A | -65 ... 150 | |
| Storage temperature | T_{stg} | -65 ... 150 | |

Thermal Resistance

| | | | |
|--|------------|------------|-----|
| Junction - soldering point ²⁾ | R_{thJS} | ≤ 240 | K/W |
|--|------------|------------|-----|

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

²For calculation of R_{thJA} please refer to Application Note Thermal Resistance

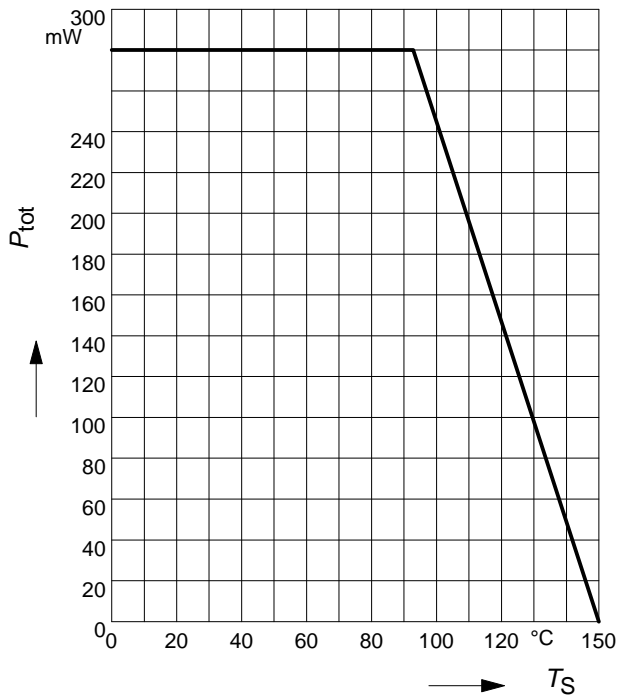
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|--|---------------|----------|---------|------------|---------------|
| | | min. | typ. | max. | |
| DC characteristics | | | | | |
| Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$ | $V_{(BR)CEO}$ | 15 | - | - | V |
| Collector-base cutoff current $V_{CB} = 10 \text{ V}, I_E = 0$ $V_{CB} = 25 \text{ V}, I_E = 0$ | I_{CBO} | - | - | 0.05 10 | μA |
| Emitter-base cutoff current $V_{EB} = 2.5 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 100 | |
| DC current gain $I_C = 2 \text{ mA}, V_{CE} = 1 \text{ V}$ $I_C = 25 \text{ mA}, V_{CE} = 1 \text{ V}$ | h_{FE} | 20 20 | - 70 | 150 - | - |
| Collector-emitter saturation voltage $I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$ | V_{CEsat} | - | 0.1 | 0.4 | V |

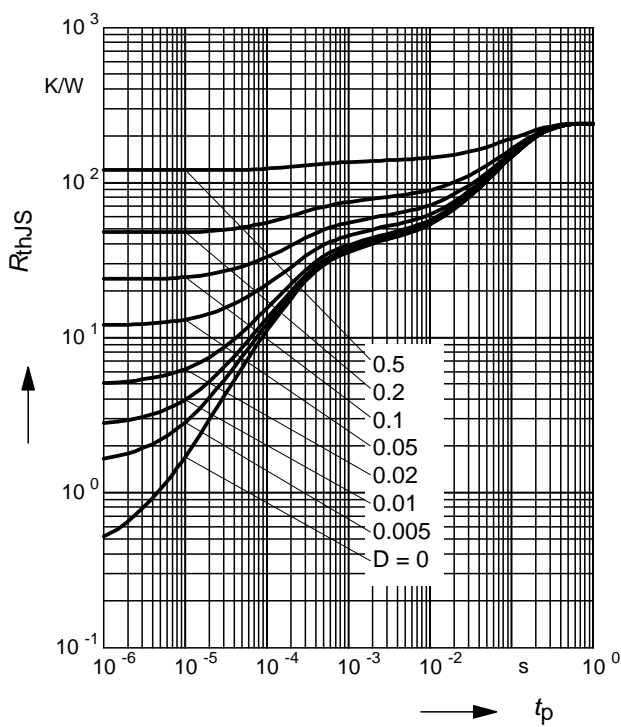
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|---|-------------------|----------|------------|--------|------|
| | | min. | typ. | max. | |
| AC characteristics | | | | | |
| Transition frequency $I_C = 2 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $f = 200 \text{ MHz}$ $I_C = 25 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $f = 200 \text{ MHz}$ | f_T | 1 1.3 | 1.4 2.5 | - - | GHz |
| Collector-base capacitance $V_{CB} = 5 \text{ V}$, $f = 1 \text{ MHz}$ | C_{cb} | - | 0.55 | 0.8 | pF |
| Collector-emitter capacitance $V_{CE} = 5 \text{ V}$, $f = 1 \text{ MHz}$ | C_{ce} | - | 0.13 | - | |
| Input capacitance $V_{EB} = 0.5 \text{ V}$, $I_C = 0$, $f = 1 \text{ MHz}$ | C_{ibo} | - | 1.45 | - | |
| Output capacitance $V_{CE} = 5 \text{ V}$, $V_{BE} = 0$, $f = 1 \text{ MHz}$ | C_{obs} | - | - | 1.5 | |
| Noise figure $I_C = 2 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $f = 800 \text{ MHz}$, $Z_S = 0 \Omega$ | F | - | 3.5 | 5 | dB |
| Transducer gain $I_C = 20 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $Z_S = Z_L = 50 \Omega$, $f = 500 \text{ MHz}$ | $ S_{21e} ^2$ | - | 12,7 | - | |
| Linear output voltage $I_C = 14 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $d_{im} = 60 \text{ dB}$, $f_1 = 806 \text{ MHz}$, $f_2 = 810 \text{ MHz}$, $Z_S = Z_L = 50 \Omega$ | $V_{01} = V_{02}$ | - | 100 | - | mV |
| Third order intercept point $I_C = 200 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 900 \text{ MHz}$ | IP_3 | - | 23 | - | dBm |

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

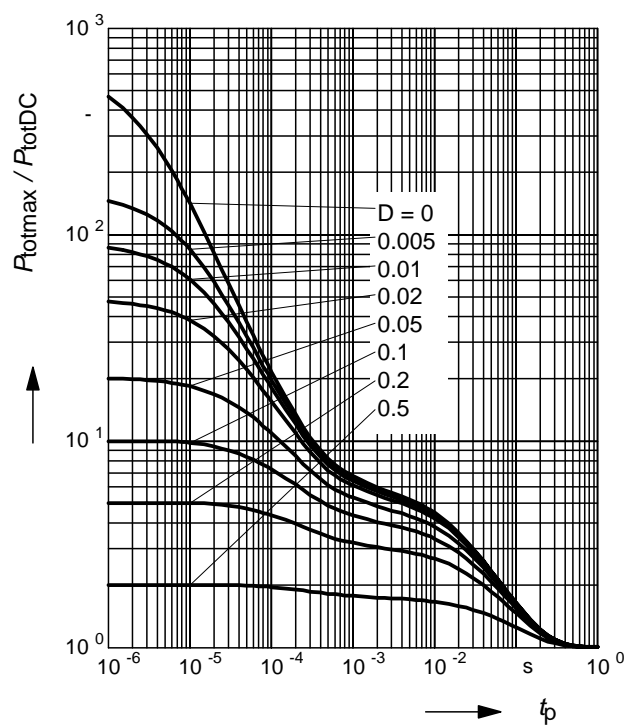


Permissible Pulse Load $R_{thJS} = f(t_p)$

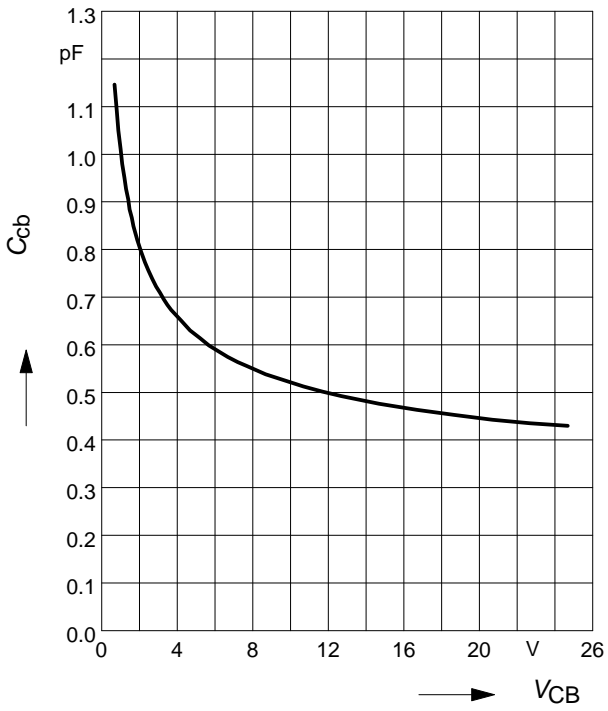


Permissible Pulse Load

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



Collector-base capacitance $C_{cb} = f(V_{CB})$
 $f = 1\text{MHz}$



Transition frequency $f_T = f(I_C)$

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

