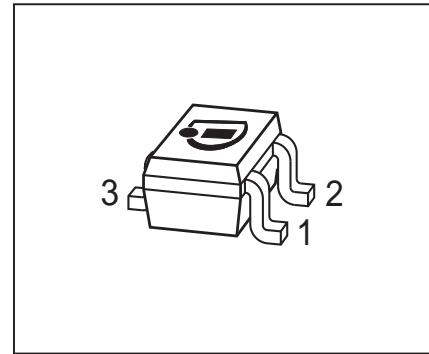


NPN Silicon RF Transistor

- For broadband amplifiers up to 1 GHz at collector currents from 1 mA to 20 mA
- Pb-free (RoHS compliant) package¹⁾
- Qualified according AEC Q101



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

| Type | Marking | Pin Configuration | | | Package |
|--------|---------|-------------------|-------|-------|---------|
| BFS17W | MCs | 1 = B | 2 = E | 3 = C | SOT323 |

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 ²⁾ $T_S \leq 93$ °C | P_{tot} | 280 | mW |
| Junction temperature | T_j | 150 | °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} | ≤ 205 | K/W |

¹⁾Pb-containing package may be available upon special request

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

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

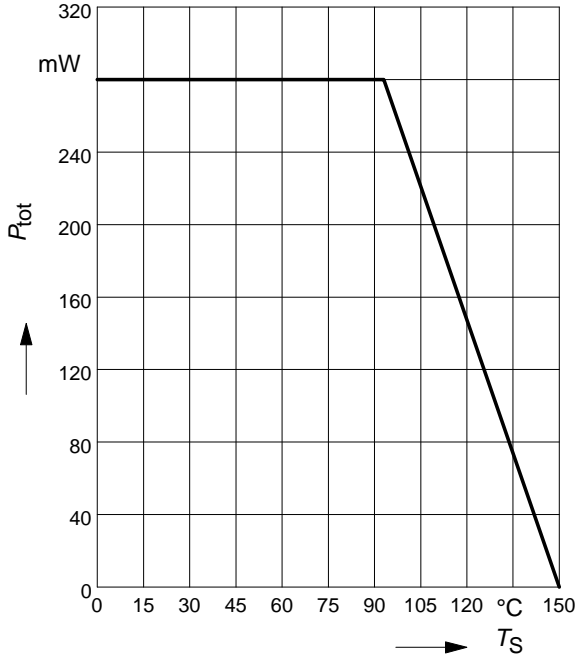
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---------------|----------|---------|------------|---------------|
| | | min. | typ. | max. | |
| 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- $I_C = 2\text{ mA}, V_{CE} = 1\text{ V}$, pulse measured $I_C = 25\text{ mA}, V_{CE} = 1\text{ V}$, pulse measured | h_{FE} | 40 20 | - 70 | 150 - | - |
| Collector-emitter saturation voltage $I_C = 10\text{ mA}, I_B = 1\text{ mA}$ | V_{CEsat} | - | 0.1 | 0.4 | V |

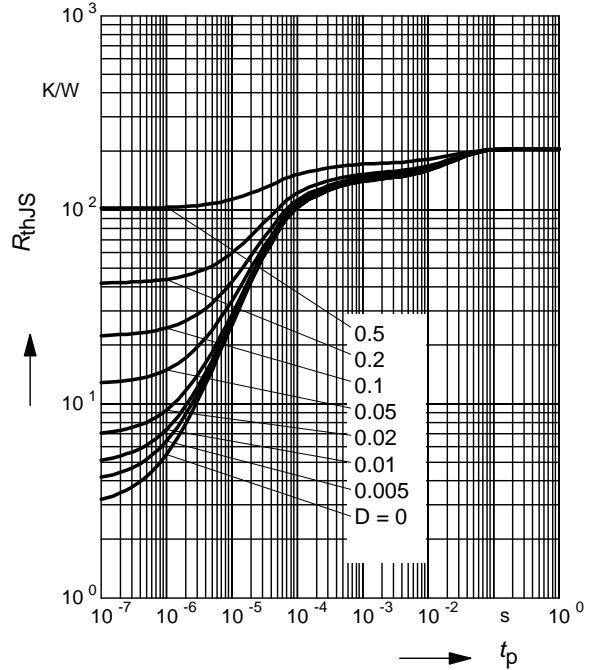
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---------------|----------|------------|--------|------|
| | | min. | typ. | max. | |
| AC Characteristics (verified by random sampling) | | | | | |
| 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 $V_{CB} = 5 \text{ V}$, $f = 1 \text{ MHz}$, $V_{BE} = 0$, emitter grounded | C_{cb} | - | 0.55 | 0.8 | pF |
| Collector emitter capacitance $V_{CE} = 5 \text{ V}$, $f = 1 \text{ MHz}$, $V_{BE} = 0$, base grounded | C_{ce} | - | 0.3 | - | |
| Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$, $f = 1 \text{ MHz}$, $V_{CB} = 0$, collector grounded | C_{eb} | - | 0.9 | 1.45 | |
| Noise figure $I_C = 2 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $Z_S = 50 \Omega$, $f = 800 \text{ MHz}$ | 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$ | - | 14 | - | dB |
| Third order intercept point at output $V_{CE} = 5 \text{ V}$, $I_C = 20 \text{ mA}$, $f = 800 \text{ MHz}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$ | IP_3 | - | 22.5 | - | dBm |
| 1dB Compression point $I_C = 20 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $Z_S = Z_L = 50 \Omega$, $f = 800 \text{ MHz}$ | P_{-1dB} | - | 11 | - | - |

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

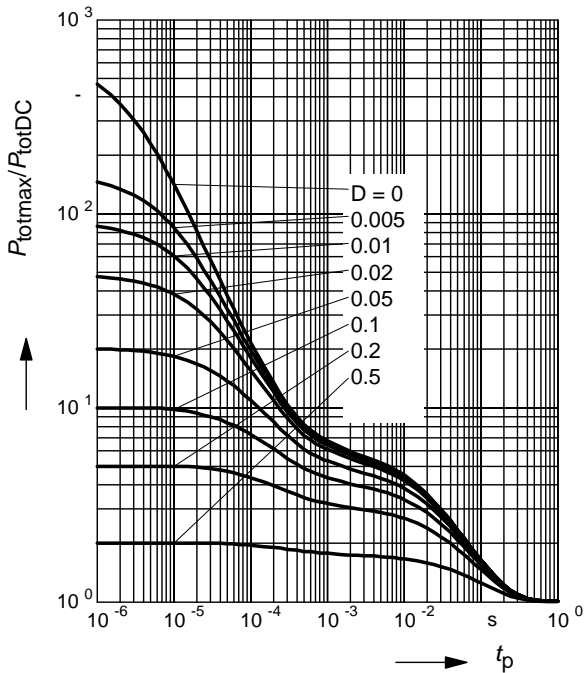


Permissible Pulse Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

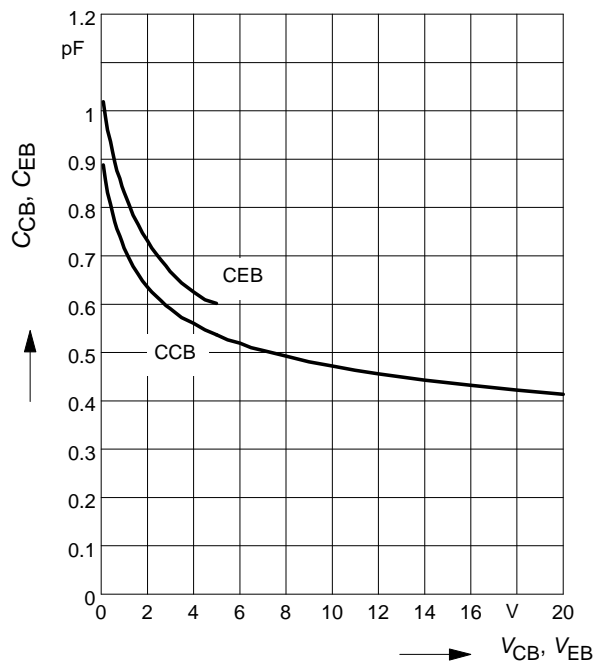
$P_{totmax}/P_{totDC} = f(t_p)$



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

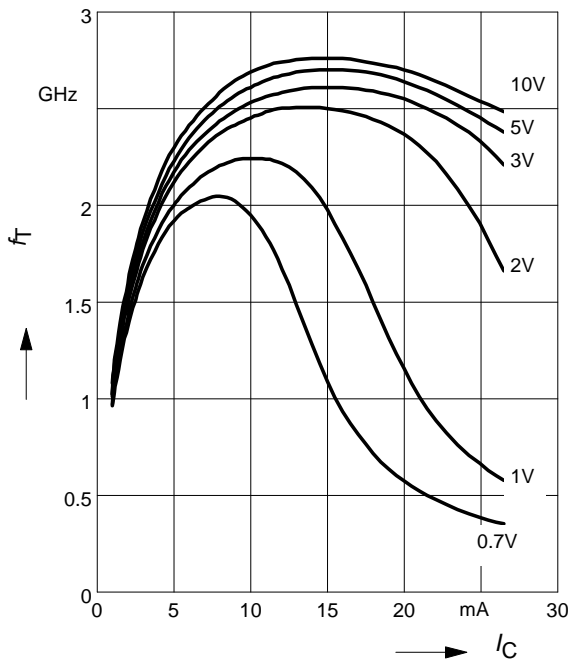
Emitter-base capacitance $C_{eb} = f(V_{EB})$

$f = 1 \text{ MHz}$

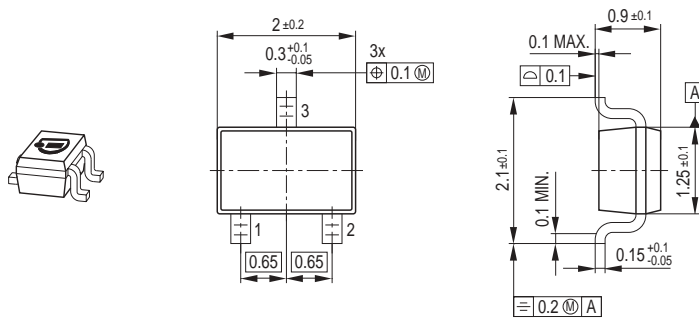


Transition frequency $f_T = f(I_C)$

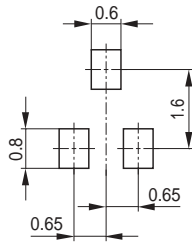
V_{CE} = parameter



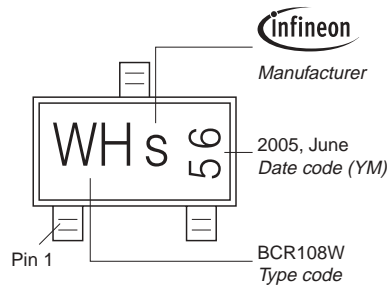
Package Outline



Foot Print

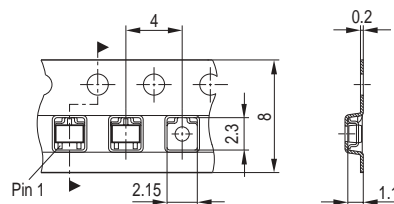


Marking Layout (Example)



Standard Packing

Reel $\varnothing 180 \text{ mm} = 3.000 \text{ Pieces/Reel}$
 Reel $\varnothing 330 \text{ mm} = 10.000 \text{ Pieces/Reel}$



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