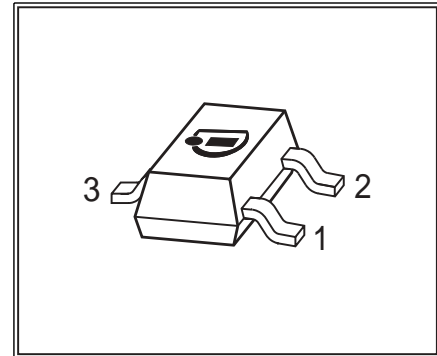


**NPN Silicon RF Transistor**

- For linear broadband amplifier application up to 500 MHz
- SAW filter driver in TV tuners
- Pb-free (RoHS compliant) package<sup>1)</sup>
- Qualified according AEC Q101



| Type  | Marking | Pin Configuration |       |       | Package |
|-------|---------|-------------------|-------|-------|---------|
| BF799 | LKs     | 1 = B             | 2 = E | 3 = C | SOT23   |

**Maximum Ratings**

| Parameter  | Symbol    | Value       | Unit |
|--|-----------|-------------|------|
| Collector-emitter voltage  | $V_{CEO}$ | 20          | V    |
| Collector-emitter voltage  | $V_{CES}$ | 30          |      |
| Collector-base voltage   | $V_{CBO}$ | 30          |      |
| Emitter-base voltage   | $V_{EBO}$ | 3           |      |
| Collector current  | $I_C$     | 35          | mA   |
| Peak collector current,  | $I_{CM}$  | 50          |      |
| Peak base current  | $I_{BM}$  | 15          |      |
| Total power dissipation<br>$T_S \leq 69\text{ °C}$ <sup>2)</sup> | $P_{tot}$ | 280         | mW   |
| Junction temperature   | $T_j$     | 150         | °C   |
| Storage temperature  | $T_{stg}$ | -65 ... 150 |      |

**Thermal Resistance**

|  |            |            |     |
|--|------------|------------|-----|
| Junction - soldering point <sup>3)</sup> | $R_{thJS}$ | $\leq 290$ | K/W |
|--|------------|------------|-----|

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

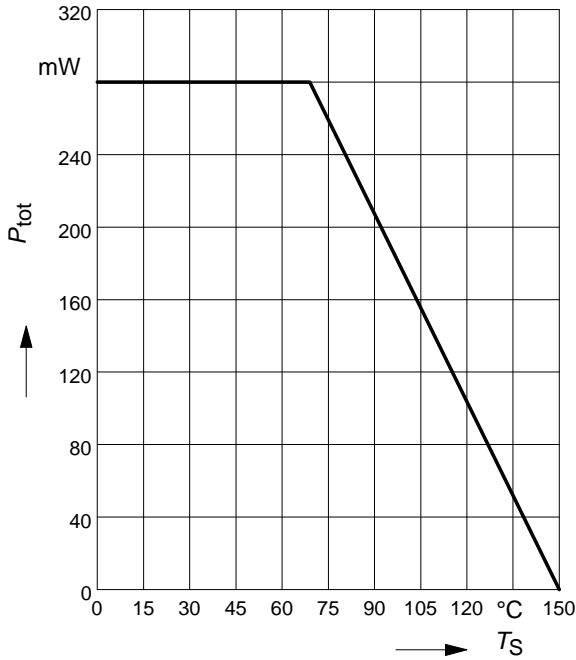
<sup>2)</sup> $T_S$  is measured on the collector lead at the soldering point to the pcb

<sup>3)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

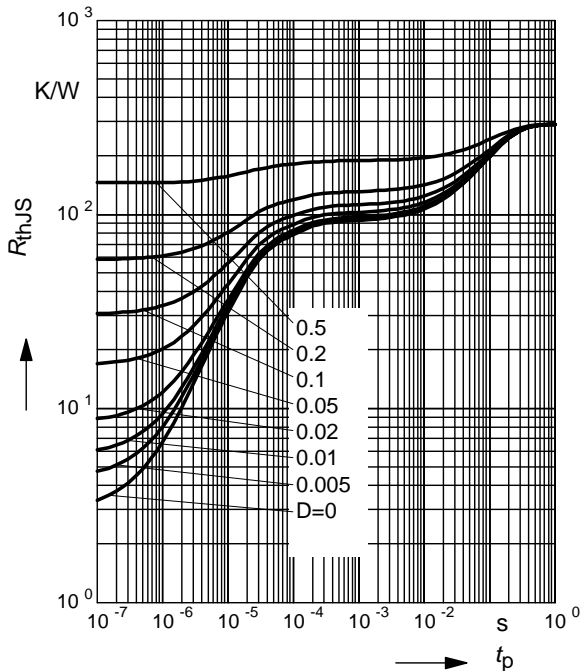
**Electrical Characteristics** at  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

| Parameter  | Symbol        | Values   |             |          | Unit          |
|--|---------------|----------|-------------|----------|---------------|
|  |               | min.     | typ.        | max.     |               |
| <b>DC characteristics</b>  |               |          |             |          |               |
| Collector-emitter breakdown voltage<br>$I_C = 1\text{ mA}, I_B = 0$  | $V_{(BR)CEO}$ | 20       | -           | -        | V             |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}, I_E = 0$   | $V_{(BR)CBO}$ | 30       | -           | -        |               |
| Base-emitter breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}, I_C = 0$   | $V_{(BR)EBO}$ | 3        | -           | -        |               |
| Collector-base cutoff current<br>$V_{CB} = 20\text{ V}, I_E = 0$   | $I_{CBO}$     | -        | -           | 100      | nA            |
| DC current gain<br>$I_C = 5\text{ mA}, V_{CE} = 10\text{ V}$<br>$I_C = 20\text{ mA}, V_{CE} = 10\text{ V}$   | $h_{FE}$      | 35<br>40 | 95<br>100   | -<br>250 | -             |
| Collector-emitter saturation voltage<br>$I_C = 20\text{ mA}, I_B = 2\text{ mA}$  | $V_{CEsat}$   | -        | 0.1         | 0.3      | V             |
| Base-emitter saturation voltage<br>$I_C = 20\text{ mA}, I_B = 2\text{ mA}$   | $V_{BEsat}$   | -        | -           | 0.95     |               |
| <b>AC characteristics</b>  |               |          |             |          |               |
| Transition frequency<br>$I_C = 5\text{ mA}, V_{CE} = 10\text{ V}, f = 100\text{ MHz}$<br>$I_C = 20\text{ mA}, V_{CE} = 8\text{ V}, f = 100\text{ MHz}$ | $f_T$         | -<br>-   | 800<br>1100 | -<br>-   | MHz           |
| Output capacitance<br>$V_{CB} = 10\text{ V}, I_E = 0\text{ mA}, f = 1\text{ MHz}$  | $C_{ob}$      | -        | 0.96        | -        | pF            |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$   | $C_{cb}$      | -        | 0.7         | -        |               |
| Collector-emitter capacitance<br>$V_{CE} = 10\text{ V}, f = 1\text{ MHz}$  | $C_{ce}$      | -        | 0.28        | -        |               |
| Noise figure<br>$I_C = 5\text{ mA}, V_{CE} = 10\text{ V}, f = 100\text{ MHz},$<br>$Z_S = 50\text{ }\Omega$   | $F$           | -        | 3           | -        | dB            |
| Output conductance<br>$I_C = 20\text{ mA}, V_{CE} = 10\text{ V}, f = 35\text{ MHz}$  | $g_{22e}$     | -        | 60          | -        | $\mu\text{S}$ |

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

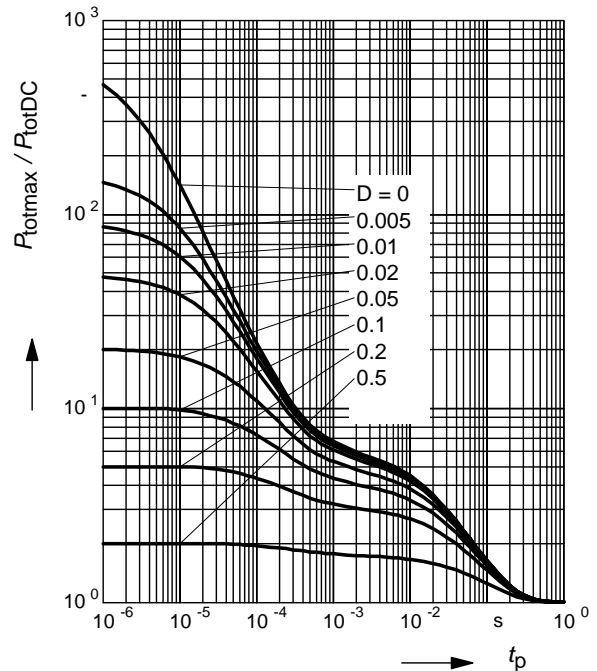


**Permissible Pulse Load  $R_{thJS} = f(t_p)$**



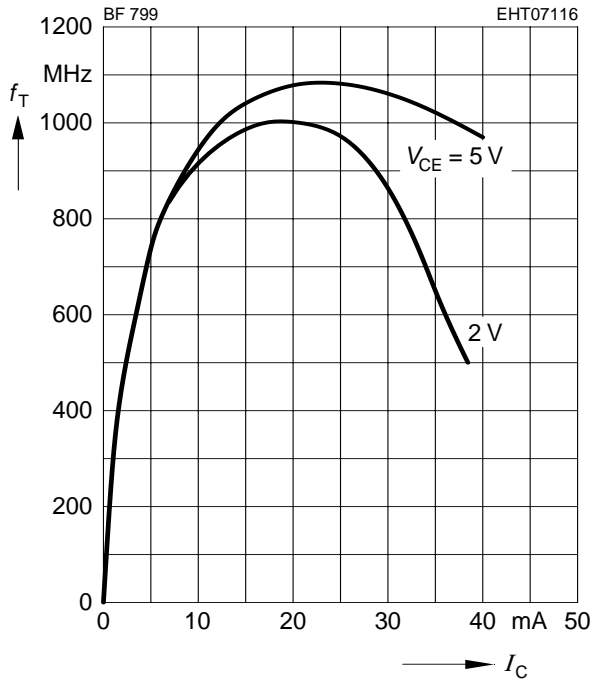
**Permissible Pulse Load**

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



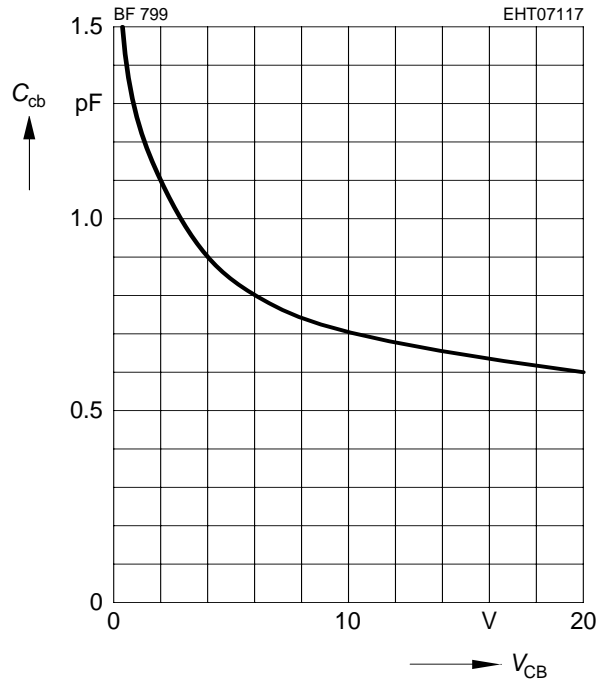
**Transition frequency  $f_T = f(I_C)$**

$f = 100\text{MHz}$

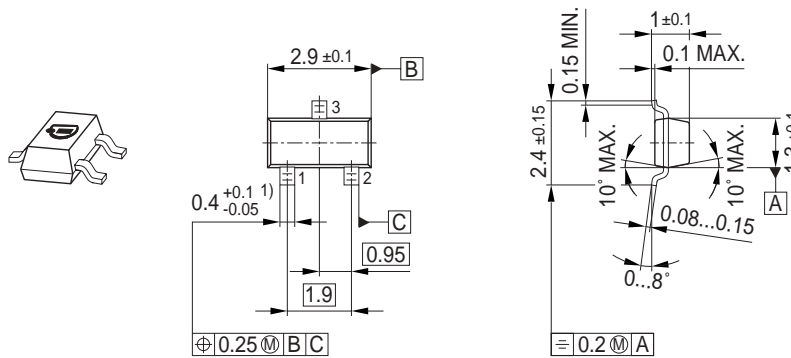


**Collector-base capacitance  $C_{cb} = f(V_{CB})$**

$f = 1\text{ MHz}$

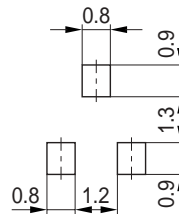


Package Outline

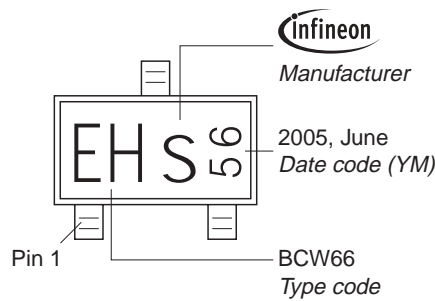


1) Lead width can be 0.6 max. in dambar area

Foot Print

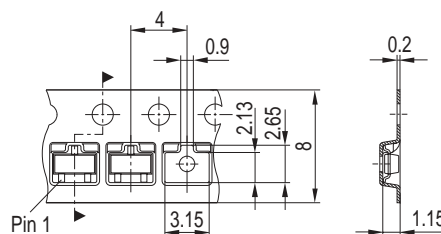


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel  
 Reel ø330 mm = 10.000 Pieces/Reel



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