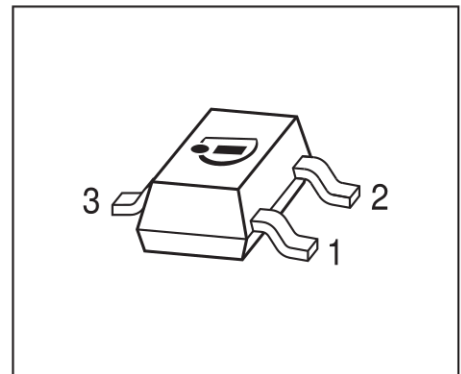


**NPN Silicon RF Transistor**

- For IF amplifiers in TV-sat tuners and for VCR modulators
- Pb-free (RoHS compliant) package <sup>1)</sup>
- Qualified according AEC Q101



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

| Type   | Marking | Pin Configuration |       |       | Package |
|--------|---------|-------------------|-------|-------|---------|
| BF770A | LSs     | 1 = B             | 2 = E | 3 = C | SOT23   |

**Maximum Ratings**

| Parameter                                                            | Symbol    | Value       | Unit             |
|----------------------------------------------------------------------|-----------|-------------|------------------|
| Collector-emitter voltage                                            | $V_{CEO}$ | 12          | V                |
| Collector-emitter voltage                                            | $V_{CES}$ | 20          |                  |
| Collector-base voltage                                               | $V_{CBO}$ | 20          |                  |
| Emitter-base voltage                                                 | $V_{EBO}$ | 2           |                  |
| Collector current                                                    | $I_C$     | 90          | mA               |
| Base current                                                         | $I_B$     | 9           |                  |
| Total power dissipation <sup>2)</sup><br>$T_S \leq 63^\circ\text{C}$ | $P_{tot}$ | 300         | mW               |
| Junction temperature                                                 | $T_j$     | 150         | $^\circ\text{C}$ |
| Ambient temperature                                                  | $T_A$     | -65 ... 150 |                  |
| Storage temperature                                                  | $T_{stg}$ | -65 ... 150 |                  |

**Thermal Resistance**

| Parameter                                | Symbol     | Value      | Unit |
|------------------------------------------|------------|------------|------|
| 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  $T_A = 25^\circ\text{C}$ , unless otherwise specified

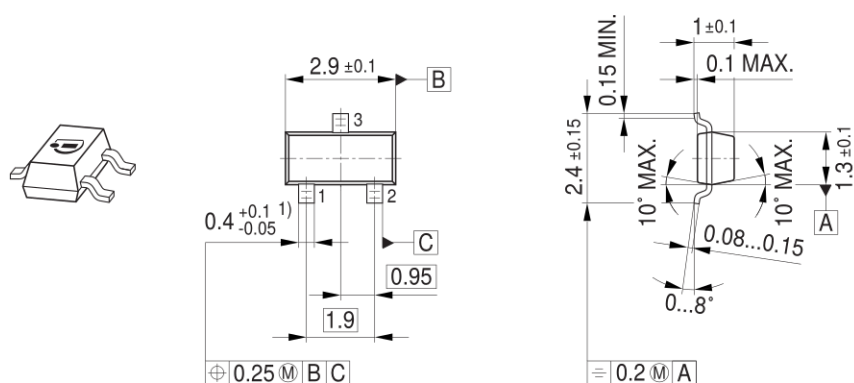
| Parameter                                                                         | Symbol        | Values |      |      | Unit          |
|-----------------------------------------------------------------------------------|---------------|--------|------|------|---------------|
|                                                                                   |               | min.   | typ. | max. |               |
| DC Characteristics                                                                |               |        |      |      |               |
| Collector-emitter breakdown voltage<br>$I_C = 1\text{ mA}$ , $I_B = 0$            | $V_{(BR)CEO}$ | 12     | -    | -    | 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>$I_C = 30\text{ mA}$ , $V_{CE} = 8\text{ V}$ , pulse measured | $h_{FE}$      | 70     | 100  | 140  | -             |

**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<br>$I_C = 30\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $f = 500\text{ MHz}$                                                                                         | $f_T$          | 4.5    | 6           | -      | GHz  |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ ,<br>emitter grounded                                                                      | $C_{cb}$       | -      | 0.54        | 0.75   | pF   |
| Collector emitter capacitance<br>$V_{CE} = 10\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ ,<br>base grounded                                                                      | $C_{ce}$       | -      | 0.25        | -      |      |
| Emitter-base capacitance<br>$V_{EB} = 0.5\text{ V}$ , $f = 1\text{ MHz}$ , $V_{CB} = 0$ ,<br>collector grounded                                                                     | $C_{eb}$       | -      | 1.9         | -      |      |
| Noise figure<br>$I_C = 5\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_{Sopt}$ ,<br>$f = 900\text{ MHz}$<br>$f = 1.8\text{ GHz}$                                                    | $F$            | -<br>- | 1.5<br>2.6  | -<br>- | dB   |
| Power gain, maximum available <sup>1)</sup><br>$I_C = 30\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_{Sopt}$ , $Z_L = Z_{Lopt}$ ,<br>$f = 900\text{ MHz}$<br>$f = 1.8\text{ GHz}$ | $G_{ma}$       | -<br>- | 14.5<br>9.5 | -<br>- |      |
| Transducer gain<br>$I_C = 30\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_L = 50\Omega$ ,<br>$f = 900\text{ MHz}$<br>$f = 1.8\text{ GHz}$                                          | $ S_{21el} ^2$ | -<br>- | 12.5<br>7   | -<br>- |      |

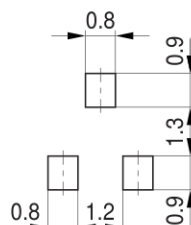
<sup>1)</sup>  $G_{ma} = |S_{21}/S_{12}| (k - (k^2 - 1)^{1/2})$

## Package Outline

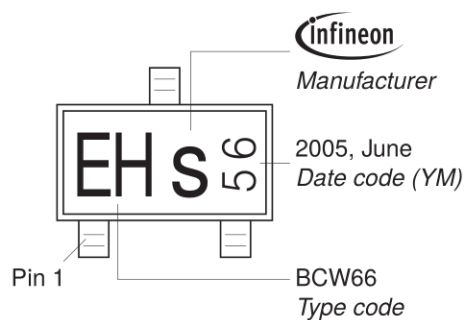


1) Lead width can be 0.6 max. in dambar area

## Foot Print

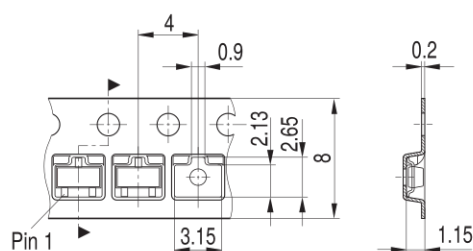


## Marking Layout (Example)



## Standard Packing

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



Edition 2006-02-01

Published by

Infineon Technologies AG

81726 München, Germany

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