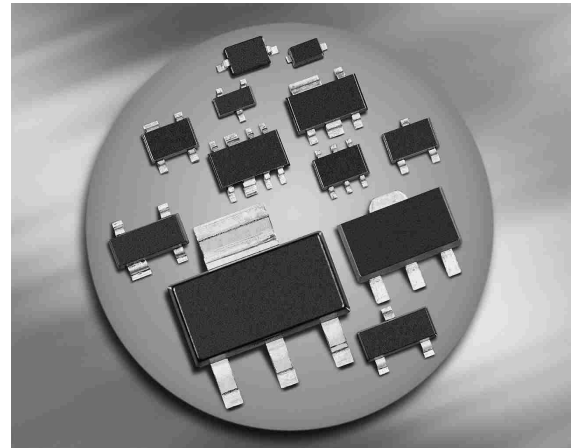
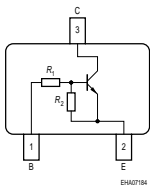


NPN Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ($R_1=47k\Omega$, $R_2=22k\Omega$)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101


BCR146


| Type | Marking | Pin Configuration | | | | | | Package |
|--------|---------|-------------------|-----|-----|---|---|---|---------|
| | | 1=B | 2=E | 3=C | - | - | - | |
| BCR146 | WLS | 1=B | 2=E | 3=C | - | - | - | SOT23 |

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|--|--------------|-------------|------------------|
| Collector-emitter voltage | V_{CEO} | 50 | V |
| Collector-base voltage | V_{CBO} | 50 | |
| Input forward voltage | $V_{i(fwd)}$ | 80 | |
| Input reverse voltage | $V_{i(rev)}$ | 10 | |
| Collector current | I_C | 70 | mA |
| Total power dissipation- $T_S \leq 102^\circ\text{C}$ | P_{tot} | 200 | mW |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -65 ... 150 | |

Thermal Resistance

| Parameter | Symbol | Value | Unit |
|--|------------|------------|------|
| Junction - soldering point ¹⁾ | R_{thJS} | ≤ 240 | 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 $I_C = 100 \mu\text{A}, I_B = 0$ | $V_{(BR)CEO}$ | 50 | - | - | V |
| Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$ | $V_{(BR)CBO}$ | 50 | - | - | |
| Collector-base cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$ | I_{CBO} | - | - | 100 | nA |
| Emitter-base cutoff current $V_{EB} = 10 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 220 | μA |
| DC current gain ²⁾ $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$ | h_{FE} | 50 | - | - | - |
| Collector-emitter saturation voltage ²⁾ $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$ | V_{CEsat} | - | - | 0.3 | V |
| Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$ | $V_{i(off)}$ | 1.2 | - | 2.6 | |
| Input on voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$ | $V_{i(on)}$ | 1.5 | - | 4 | |
| Input resistor | R_1 | 32 | 47 | 62 | $\text{k}\Omega$ |
| Resistor ratio | R_1/R_2 | 1.92 | 2.14 | 2.36 | - |

AC Characteristics

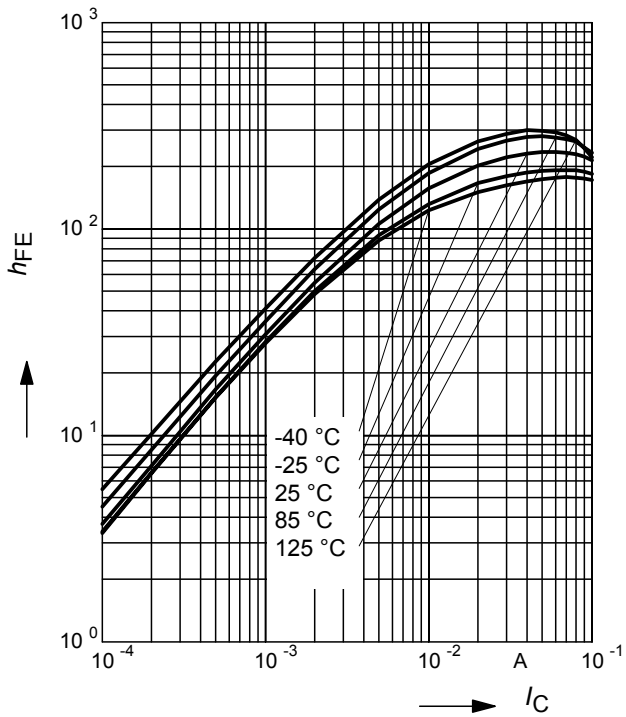
| | | | | | |
|--|----------|---|-----|---|-----|
| Transition frequency $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$ | f_T | - | 150 | - | MHz |
| Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$ | C_{cb} | - | 3 | - | pF |

¹For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)

²Pulse test: $t < 300 \mu\text{s}; D < 2\%$

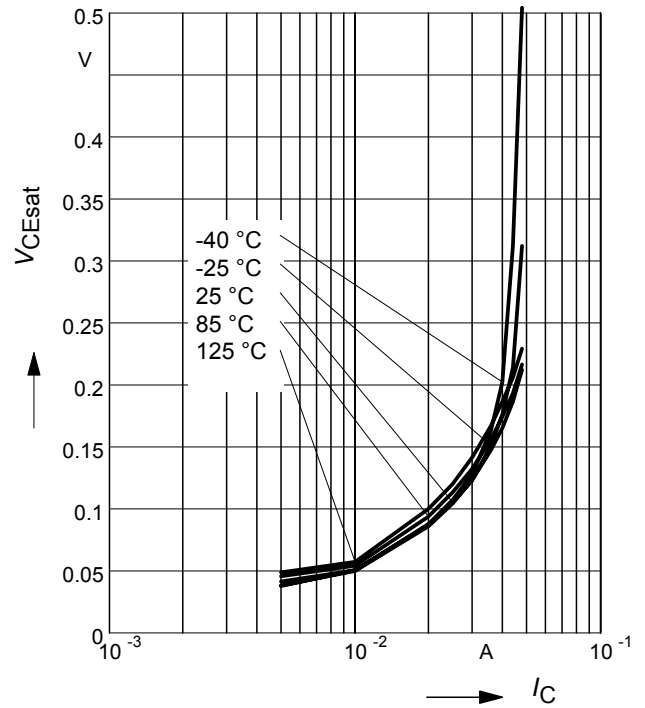
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 5V$ (common emitter configuration)



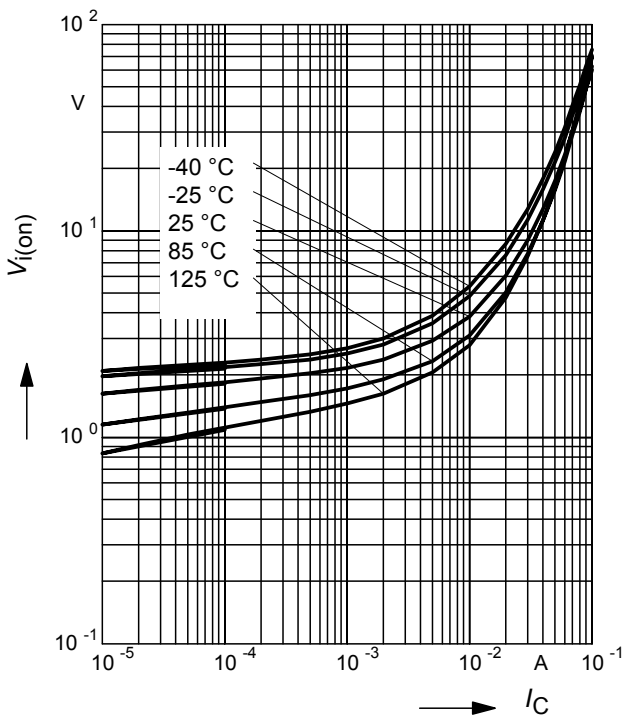
Collector-emitter saturation voltage

$V_{CEsat} = f(I_C), I_C/I_B = 20$



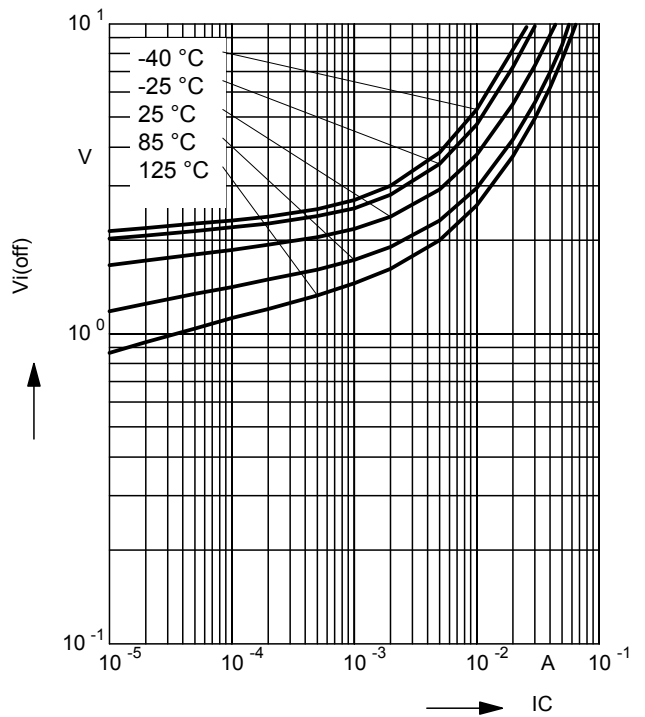
Input on Voltage $V_{i(on)} = f(I_C)$

$V_{CE} = 0.3V$ (common emitter configuration)



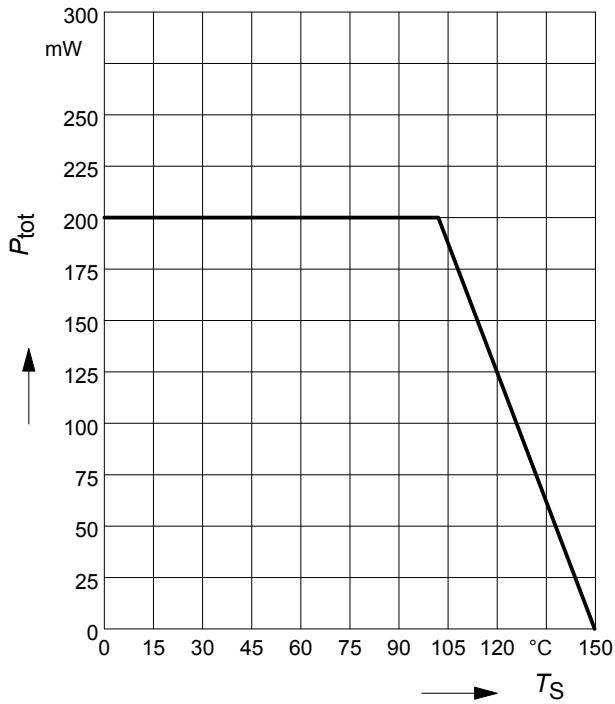
Input off voltage $V_{i(off)} = f(I_C)$

$V_{CE} = 5V$ (common emitter configuration)



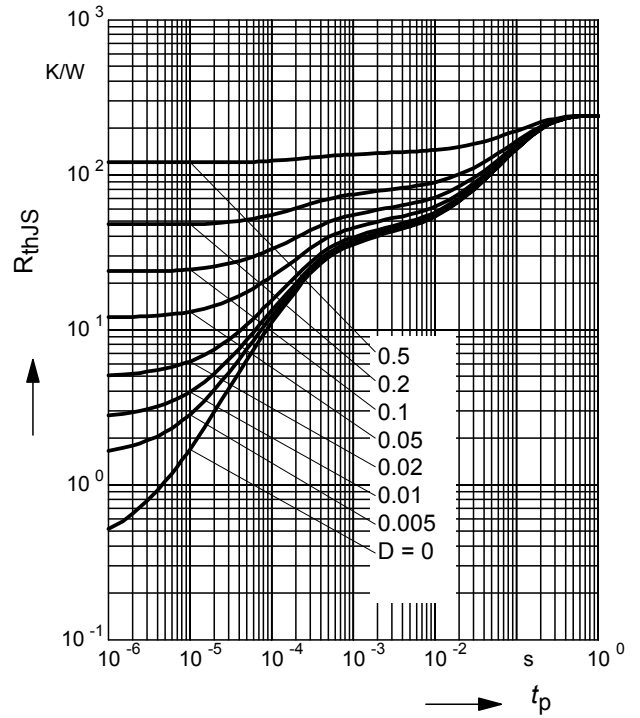
Total power dissipation $P_{tot} = f(T_S)$

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

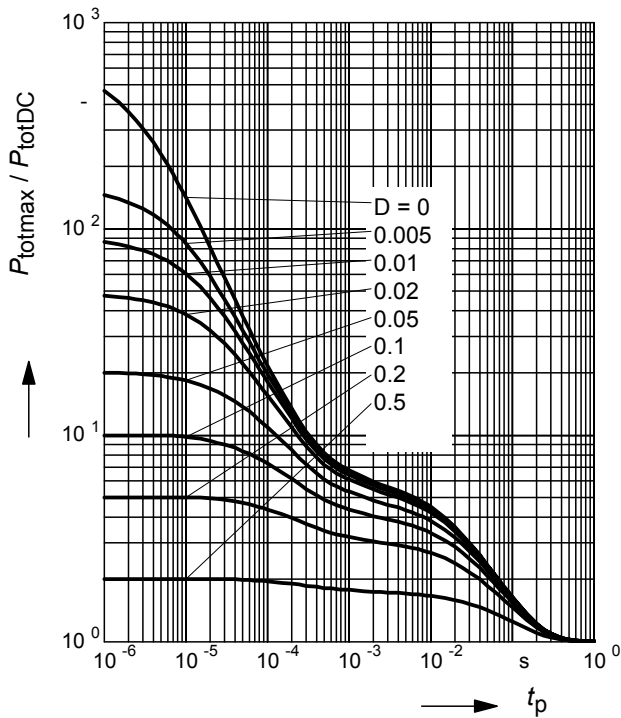
BCR146



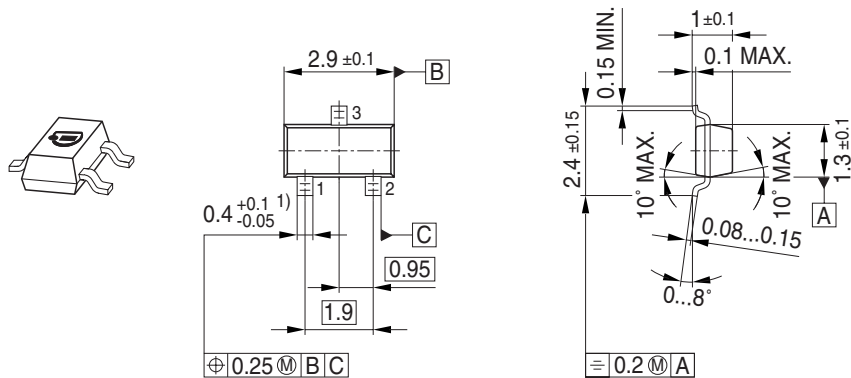
Permissible Pulse Load

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

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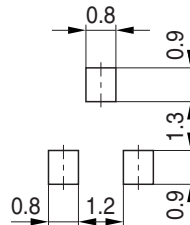


Package Outline

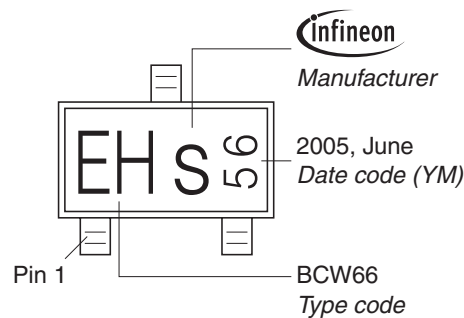


1) Lead width can be 0.6 max. in dambar area

Foot Print

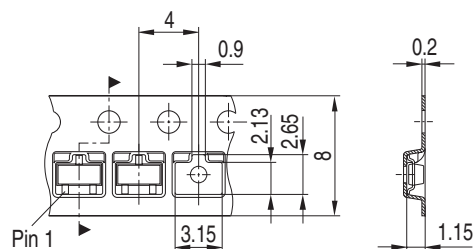


Marking Layout (Example)



Standard Packing

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



Edition 2009-11-16

**Published by
Infineon Technologies AG
81726 Munich, Germany**

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