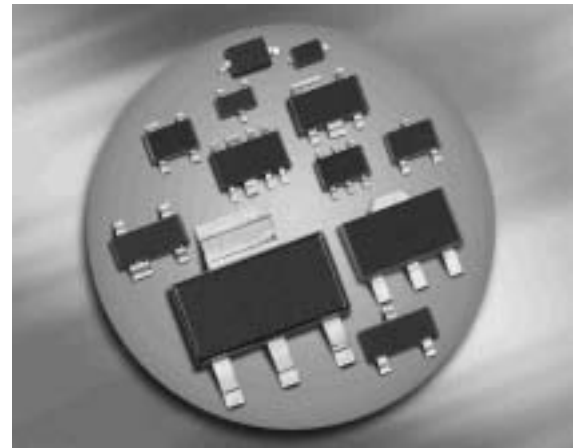
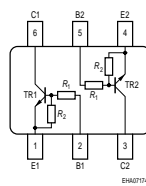
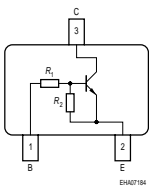


NPN Silicon Digital Transistor

- Switching circuit, inverter, interface circuit driver circuit
- Built in bias resistor ($R_1=10\text{ k}\Omega$, $R_2=47\text{ k}\Omega$)
- BCR135S: Two internally isolated transistors with good matching in one multichip package
- BCR135S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package ¹⁾
- Qualified according AEC Q101


BCR135/F
BCR135W
BCR135S


| Type | Marking | Pin Configuration | | | | | | Package |
|---------|---------|-------------------|------|------|------|------|------|---------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | |
| BCR135 | WJs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BCR135F | WJs | 1=B | 2=E | 3=C | - | - | - | TSFP-3 |
| BCR135S | WJs | 1=E1 | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363 |
| BCR135W | WJs | 1=B | 2=E | 3=C | - | - | - | SOT323 |

¹Pb-containing package may be available upon special request

Maximum Ratings

| Parameter | Symbol | Value | Unit | |
|---------------------------------------|--------------|-------------|------|-----|
| Collector-emitter voltage | V_{CEO} | 50 | V | |
| Collector-base voltage | V_{CBO} | 50 | | |
| Input forward voltage | $V_{i(fwd)}$ | 40 | | |
| Input reverse voltage | $V_{i(rev)}$ | 6 | | |
| Collector current | I_C | 100 | mA | |
| Total power dissipation | P_{tot} | | mW | |
| BCR135, $T_S \leq 102^\circ\text{C}$ | | | | 200 |
| BCR135F, $T_S \leq 128^\circ\text{C}$ | | | | 250 |
| BCR135S, $T_S \leq 115^\circ\text{C}$ | | | | 250 |
| BCR135W, $T_S \leq 124^\circ\text{C}$ | | | | 250 |
| Junction temperature | T_j | 150 | °C | |
| Storage temperature | T_{stg} | -65 ... 150 | | |

Thermal Resistance

| Parameter | Symbol | Value | Unit | |
|--|------------|-------|------|------------|
| Junction - soldering point ¹⁾ | R_{thJS} | | K/W | |
| BCR135 | | | | ≤ 240 |
| BCR135F | | | | ≤ 90 |
| BCR135S | | | | ≤ 140 |
| BCR135W | | | | ≤ 105 |

¹For calculation of R_{thJA} please refer to Application Note Thermal Resistance

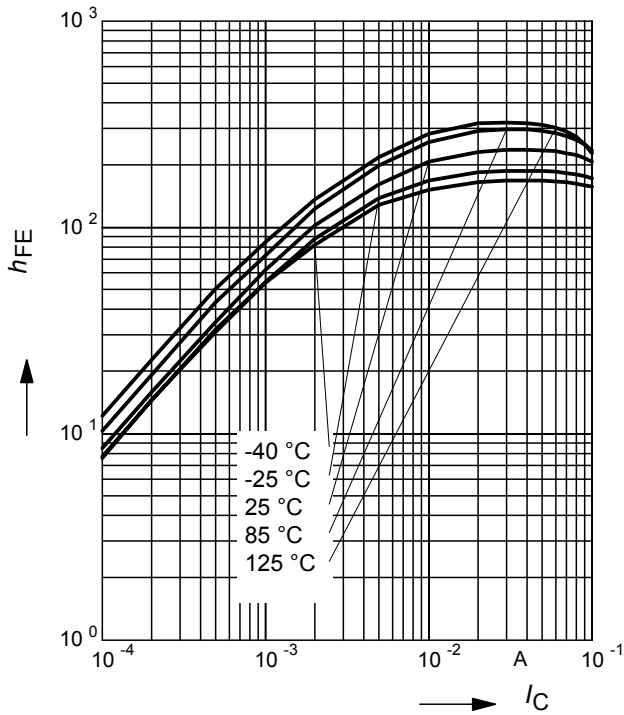
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---------------|--------|------|------|------------------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$ | $V_{(BR)CEO}$ | 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 $V_{EB} = 6 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 167 | μA |
| DC current gain ¹⁾ $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$ | h_{FE} | 70 | - | - | - |
| Collector-emitter saturation voltage ¹⁾ $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$ | V_{CEsat} | - | - | 0.3 | V |
| Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$ | $V_{i(off)}$ | 0.5 | - | 1 | |
| Input on voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$ | $V_{i(on)}$ | 0.5 | - | 1.4 | |
| Input resistor | R_1 | 7 | 10 | 13 | $\text{k}\Omega$ |
| Resistor ratio | R_1/R_2 | 0.19 | 0.21 | 0.24 | - |
| 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 |

¹Pulse test: $t < 300 \mu\text{s}$; $D < 2\%$

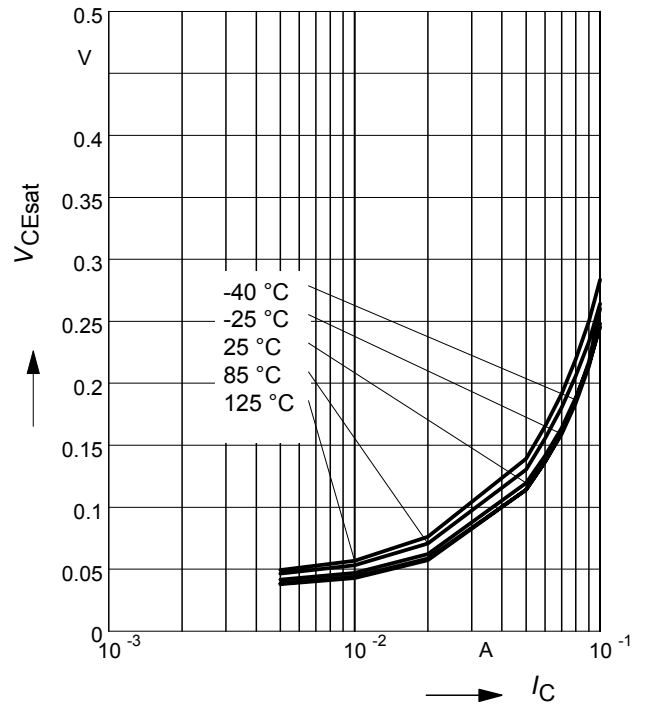
DC current gain $h_{FE} = f(I_C)$

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



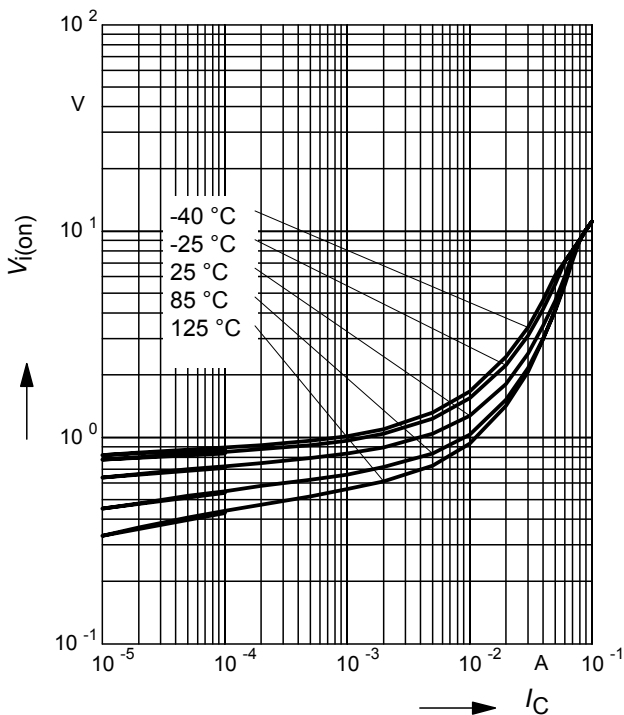
Collector-emitter saturation voltage

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



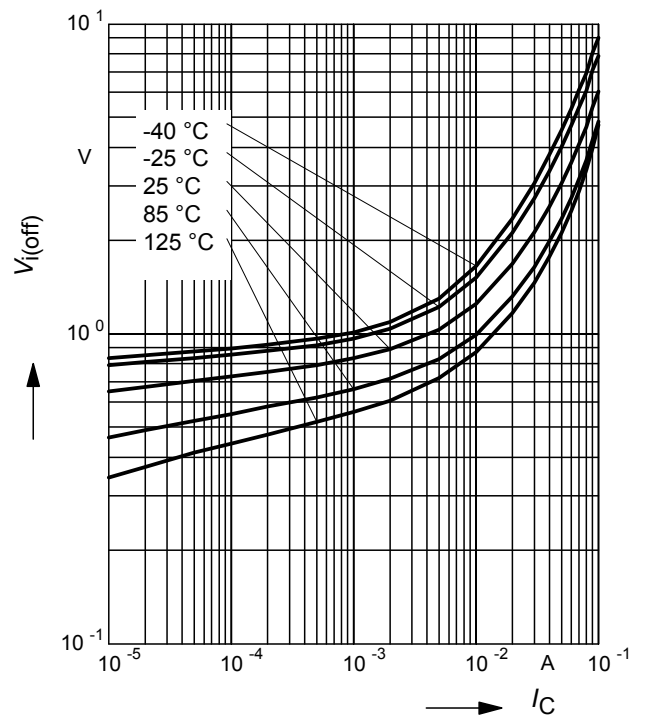
Input on Voltage $V_{i(on)} = f(I_C)$

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



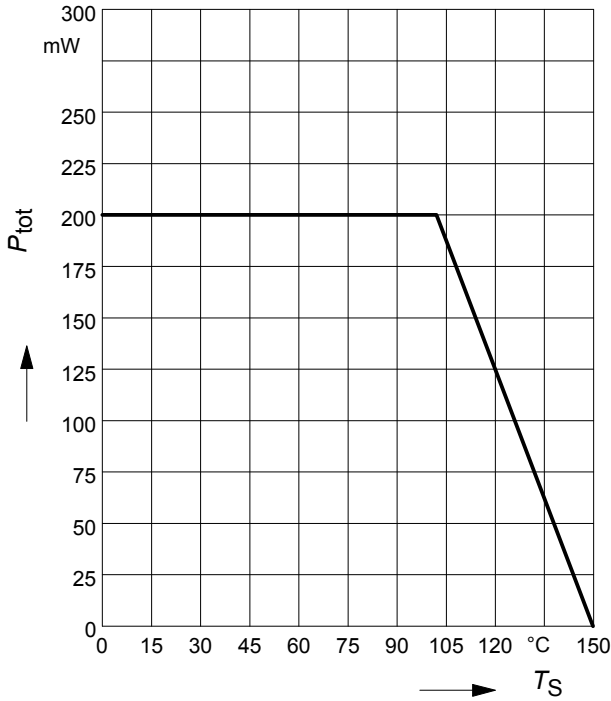
Input off voltage $V_{i(off)} = f(I_C)$

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



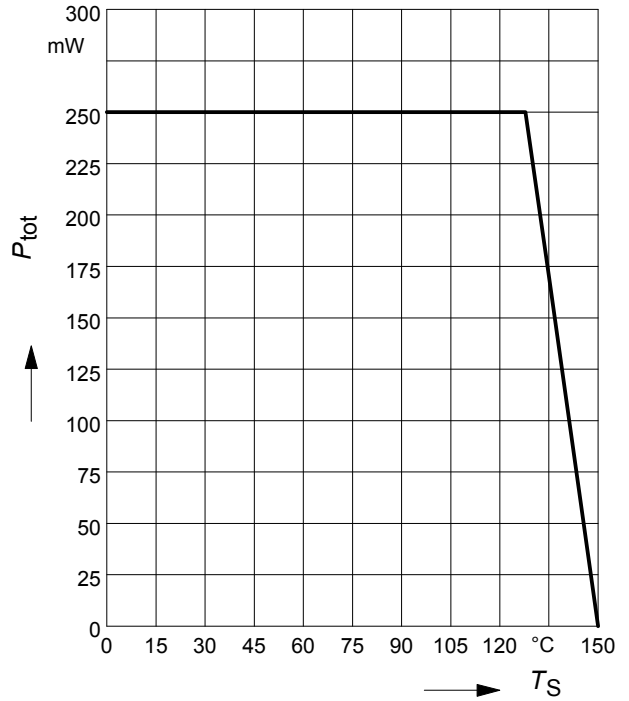
Total power dissipation $P_{tot} = f(T_S)$

BCR135



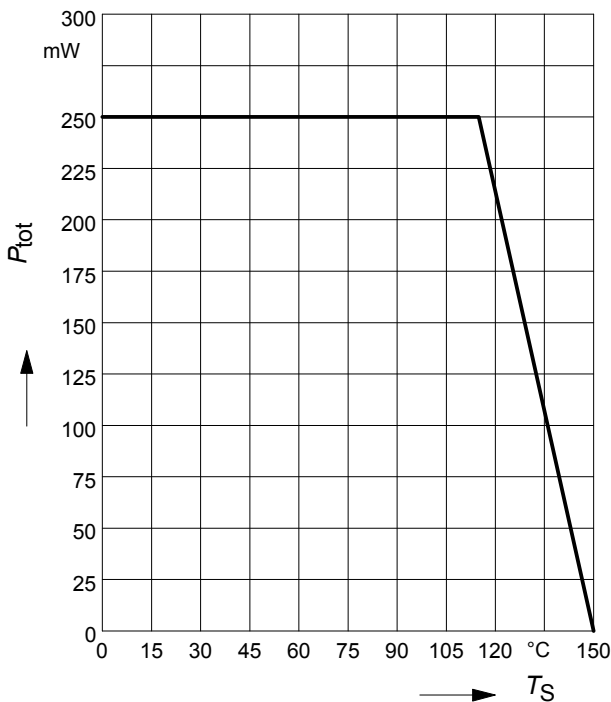
Total power dissipation $P_{tot} = f(T_S)$

BCR135F



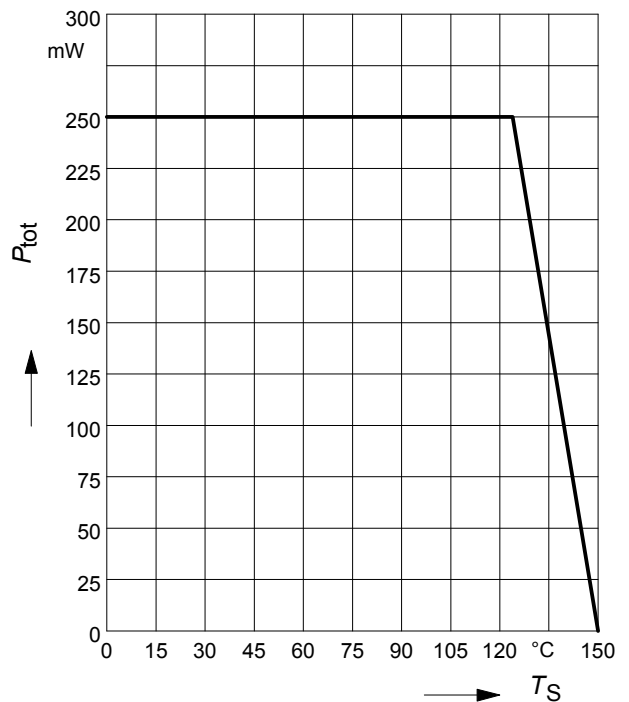
Total power dissipation $P_{tot} = f(T_S)$

BCR135S



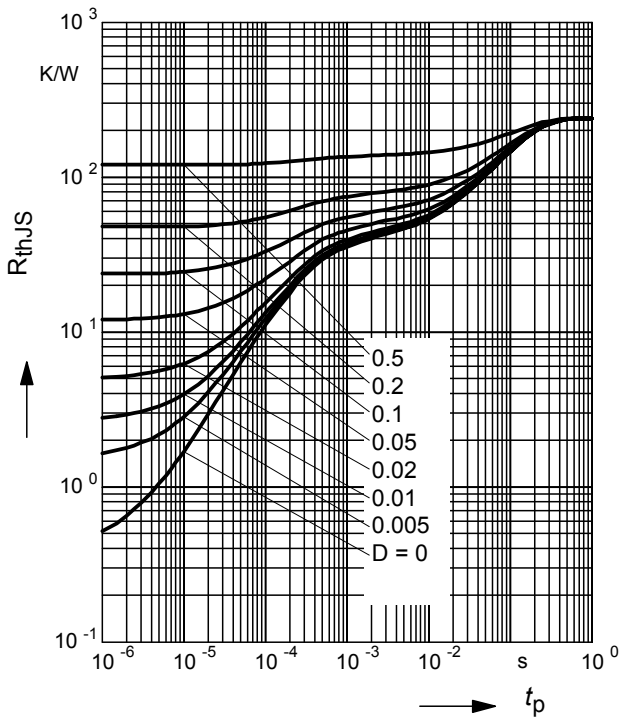
Total power dissipation $P_{tot} = f(T_S)$

BCR135W



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

BCR135



Permissible Pulse Load

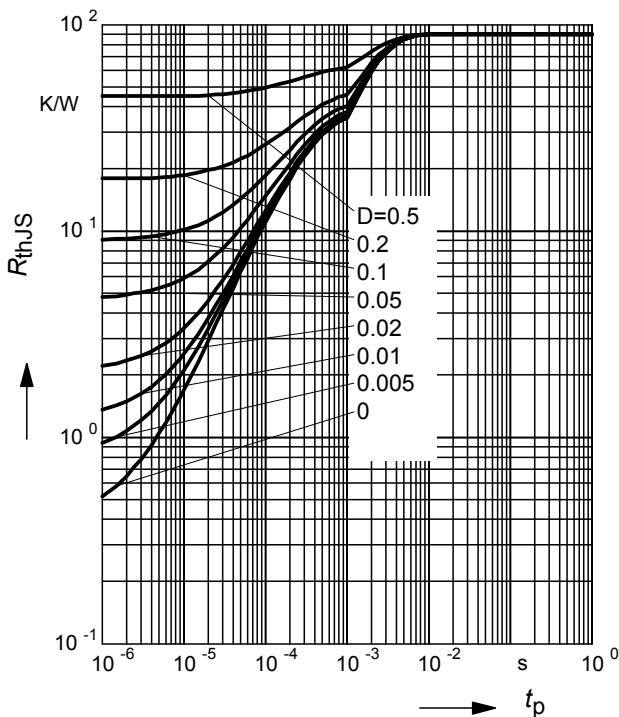
$P_{totmax}/P_{totDC} = f(t_p)$

BCR135



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

BCR135F



Permissible Pulse Load

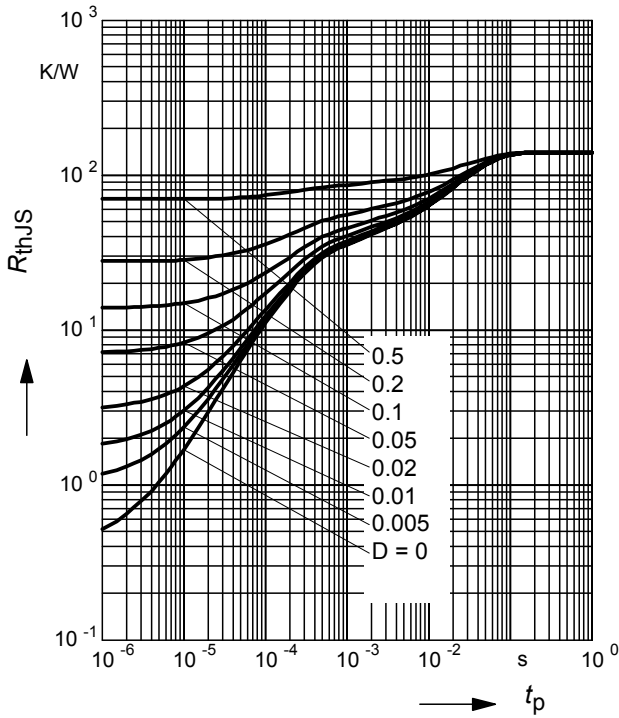
$P_{totmax}/P_{totDC} = f(t_p)$

BCR135F



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

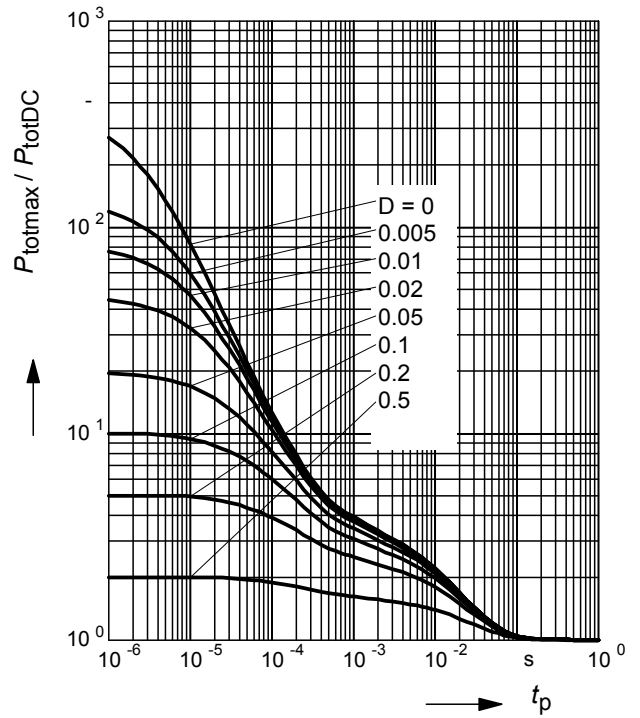
BCR135S



Permissible Pulse Load

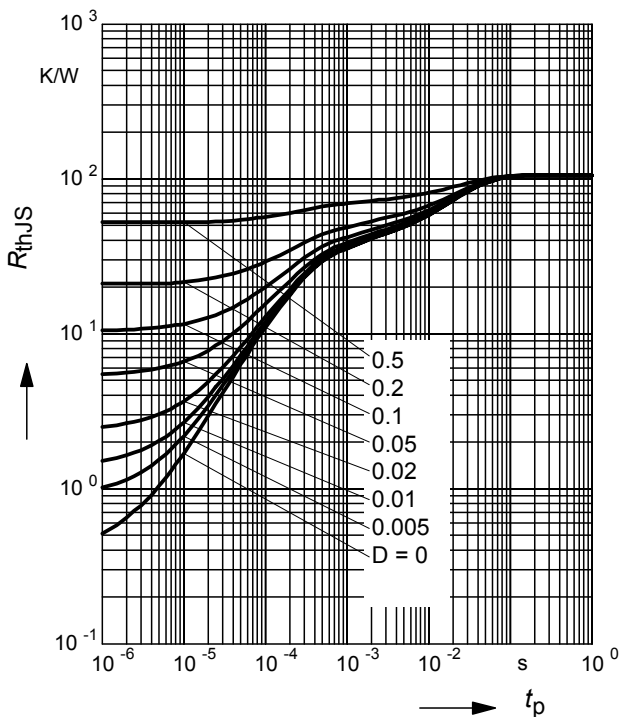
$P_{totmax}/P_{totDC} = f(t_p)$

BCR135S



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

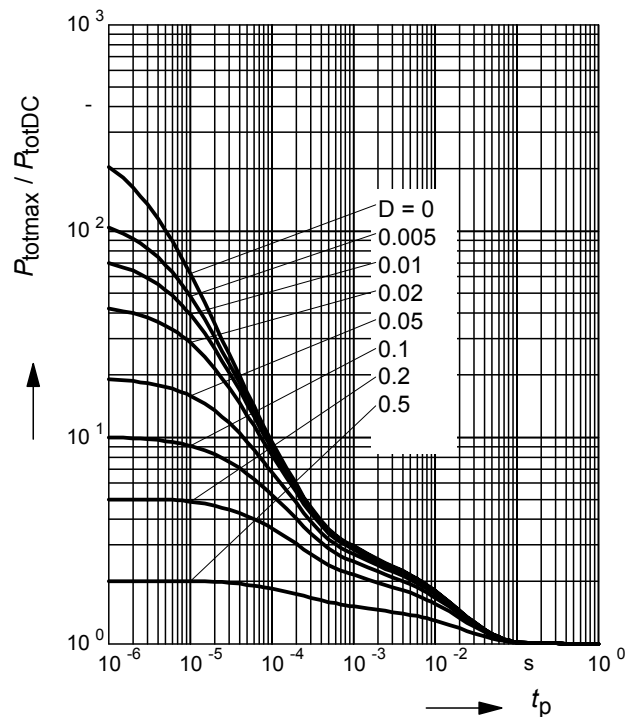
BCR135W



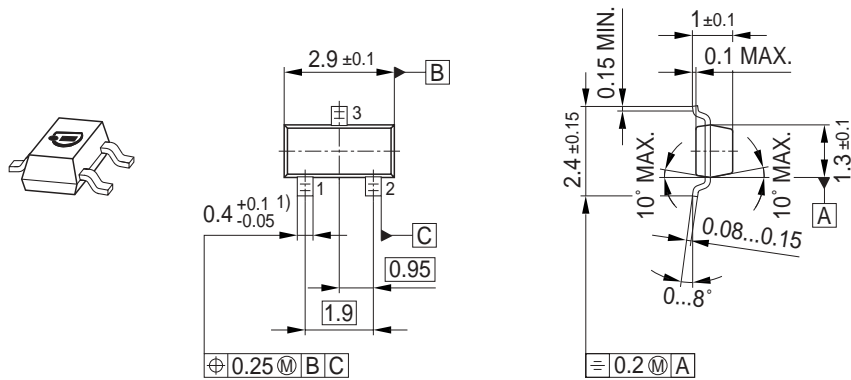
Permissible Pulse Load

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

BCR135W

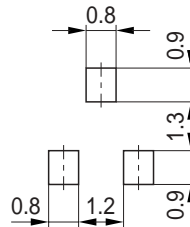


Package Outline

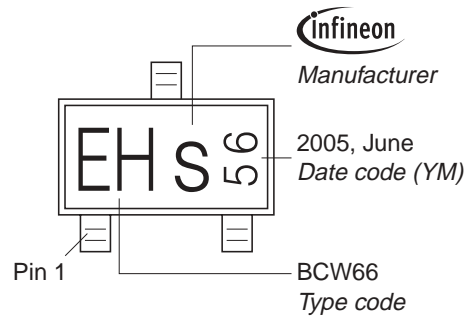


1) Lead width can be 0.6 max. in dambar area

Foot Print

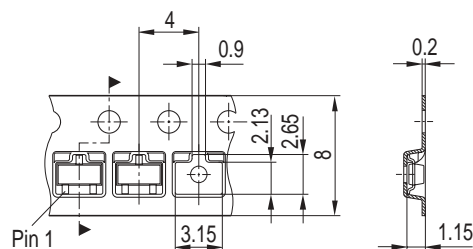


Marking Layout (Example)

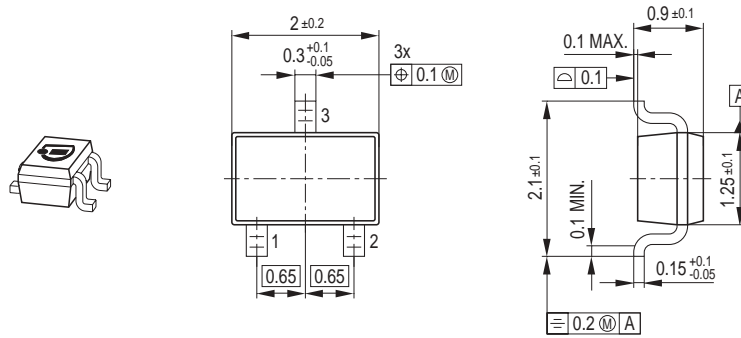


Standard Packing

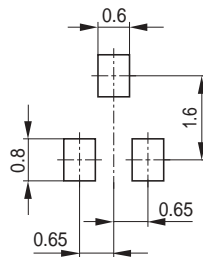
Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel



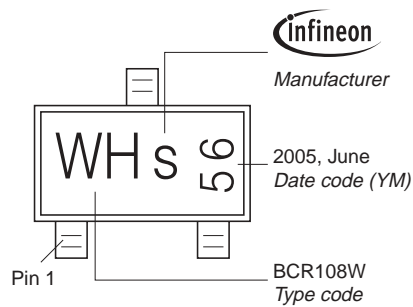
Package Outline



Foot Print

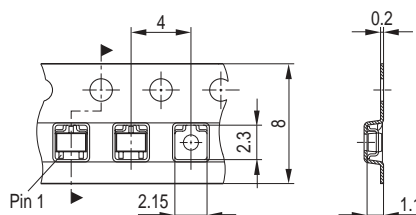


Marking Layout (Example)

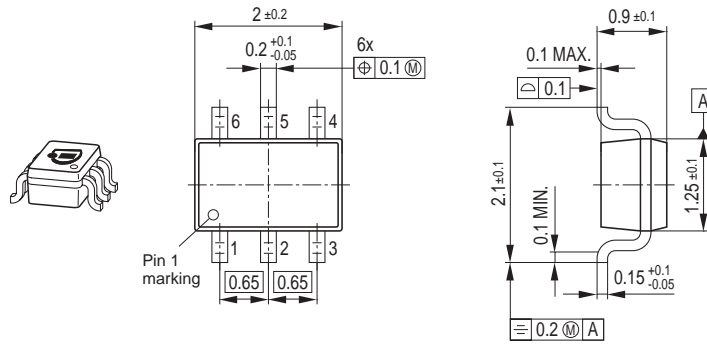


Standard Packing

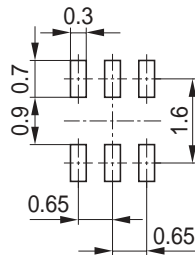
Reel $\varnothing 180$ mm = 3.000 Pieces/Reel
Reel $\varnothing 330$ mm = 10.000 Pieces/Reel



Package Outline

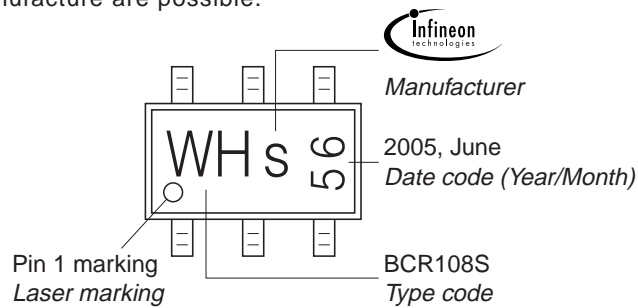


Foot Print



Marking Layout (Example)

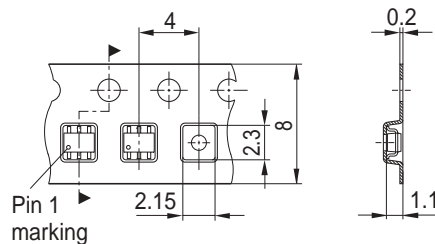
Small variations in positioning of Date code, Type code and Manufacture are possible.



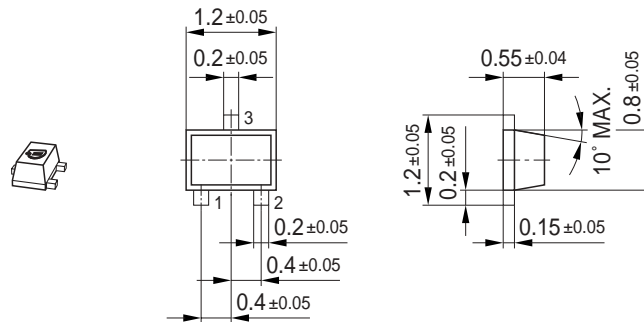
Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

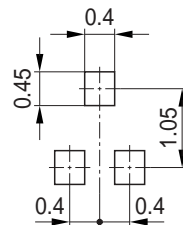
For symmetric types no defined Pin 1 orientation in reel.



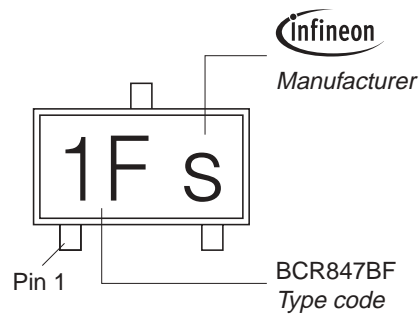
Package Outline



Foot Print

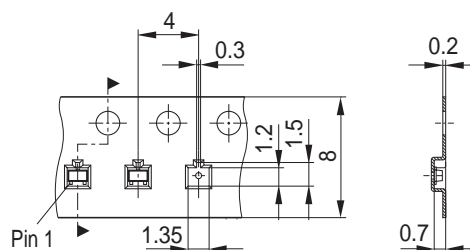


Marking Layout (Example)



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel



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