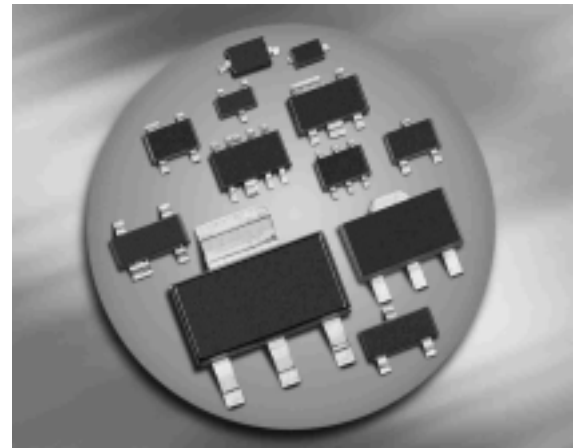
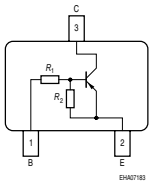


PNP Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ($R_1 = 4.7\text{ k}\Omega$, $R_2 = 47\text{ k}\Omega$)


BCR166/F/L3
BCR166T/W


| Type | Marking | Pin Configuration | | | | | | Package |
|----------|---------|-------------------|-----|-----|---|---|---|----------|
| | | 1=B | 2=E | 3=C | - | - | - | |
| BCR166 | WTs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BCR166F | WTs | 1=B | 2=E | 3=C | - | - | - | TSFP-3 |
| BCR166L3 | WT | 1=B | 2=E | 3=C | - | - | - | TSLP-3-4 |
| BCR166T | WT | 1=B | 2=E | 3=C | - | - | - | SC75 |
| BCR166W | WTs | 1=B | 2=E | 3=C | - | - | - | SOT323 |

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|--------------|---------------------------------|------|
| Collector-emitter voltage | V_{CEO} | 50 | V |
| Collector-base voltage | V_{CBO} | 50 | |
| Input forward voltage | $V_{i(fwd)}$ | 30 | |
| Input reverse voltage | $V_{i(rev)}$ | 5 | |
| Collector current | I_C | 100 | mA |
| Total power dissipation- BCR166, $T_S \leq 102^\circ\text{C}$ BCR166F, $T_S \leq 128^\circ\text{C}$ BCR166L3, $T_S \leq 135^\circ\text{C}$ BCR166T, $T_S \leq 109^\circ\text{C}$ BCR166W, $T_S \leq 124^\circ\text{C}$ | P_{tot} | 200 250 250 250 250 | mW |
| 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 |
| BCR166 | | ≤ 240 | |
| BCR166F | | ≤ 90 | |
| BCR166L3 | | ≤ 60 | |
| BCR166T | | ≤ 165 | |
| BCR166W | | ≤ 105 | |

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

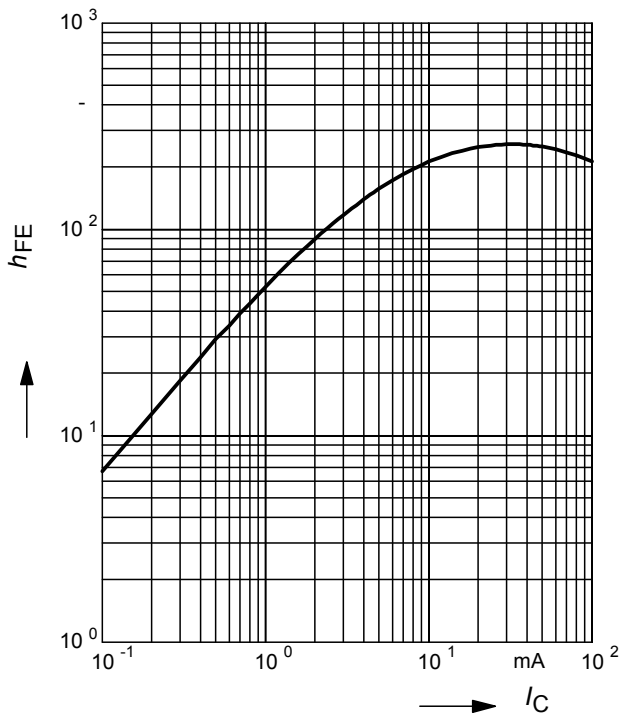
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| 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 $V_{EB} = 5 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 155 | 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 $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$ | $V_{i(off)}$ | 0.4 | - | 0.8 | |
| 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 | 3.2 | 4.7 | 6.2 | $\text{k}\Omega$ |
| Resistor ratio | R_1/R_2 | 0.09 | 0.1 | 0.11 | - |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$ | f_T | - | 160 | - | MHz |
| Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$ | C_{cb} | - | 3 | - | pF |

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

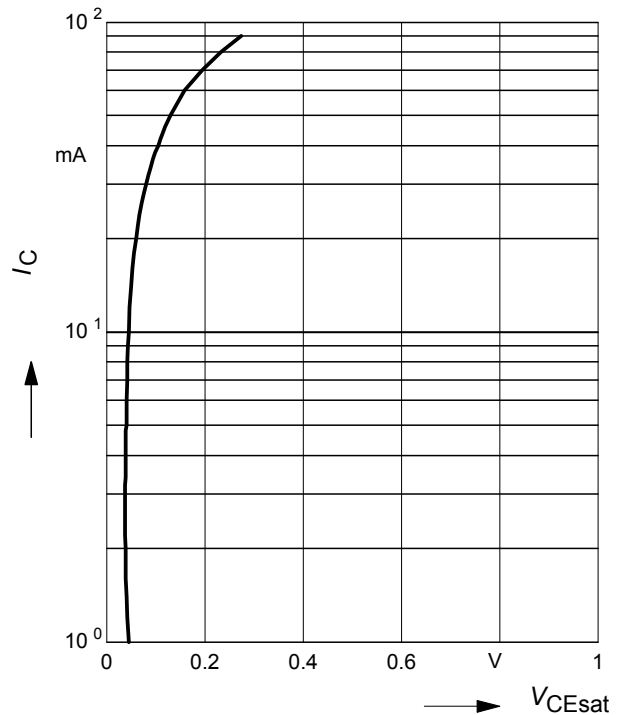
DC current gain $h_{FE} = f(I_C)$

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



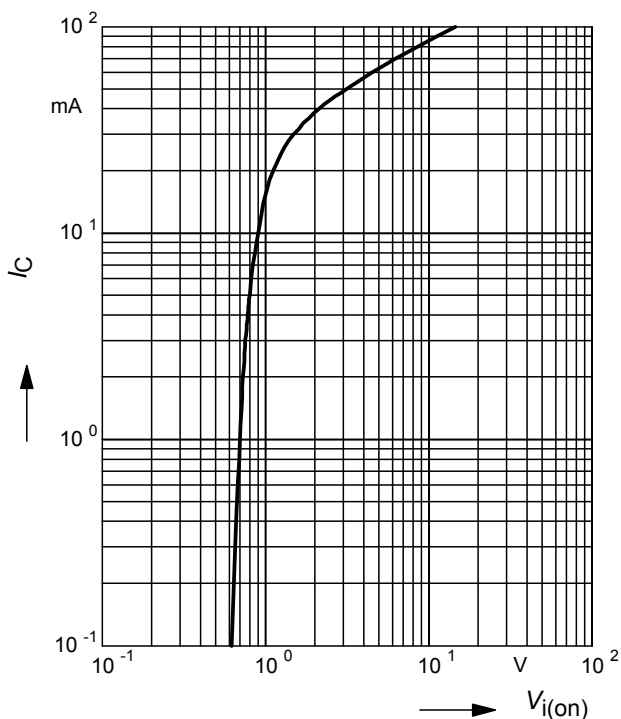
Collector-emitter saturation voltage

$V_{CEsat} = f(I_C), h_{FE} = 20$



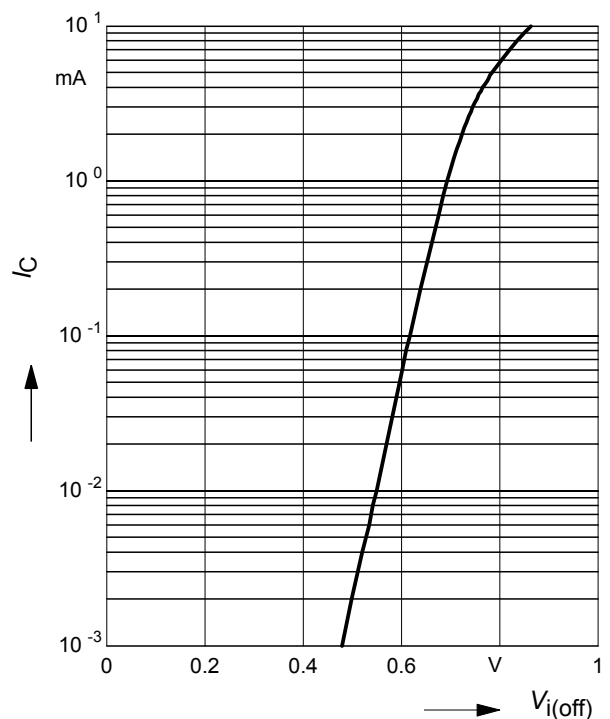
Input on Voltage $V_{i(on)} = f(I_C)$

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



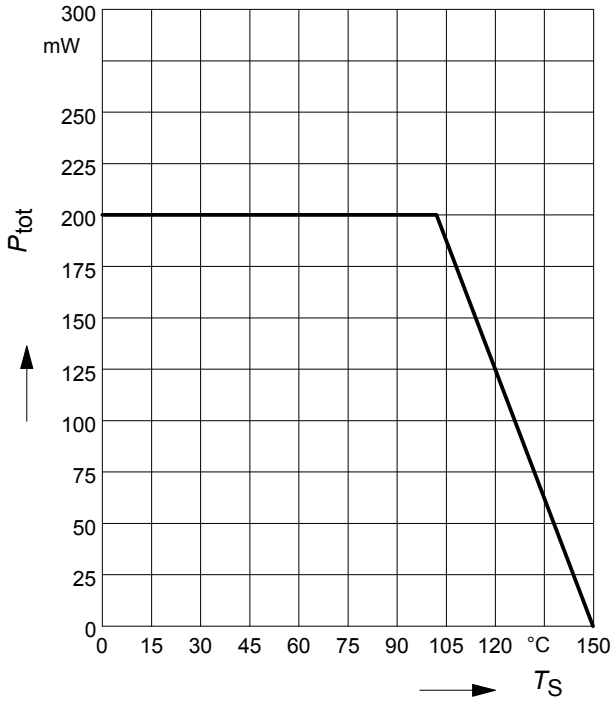
Input off voltage $V_{i(off)} = f(I_C)$

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



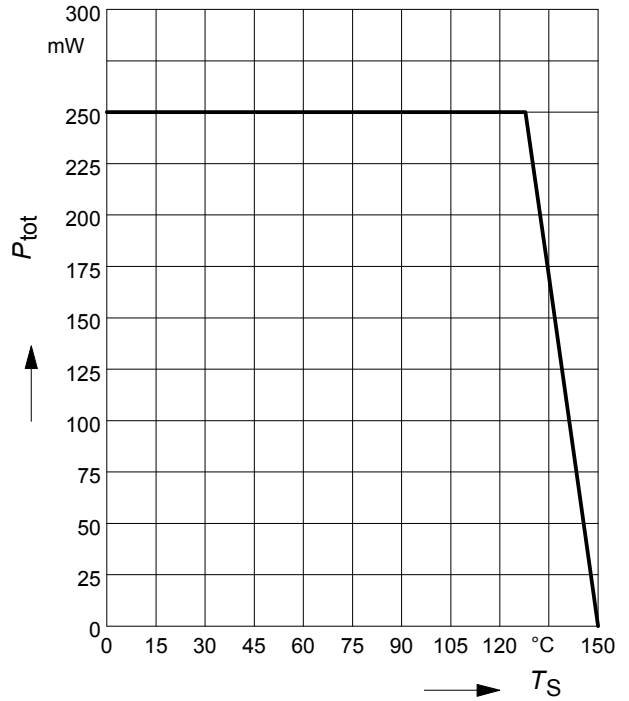
Total power dissipation $P_{tot} = f(T_S)$

BCR166



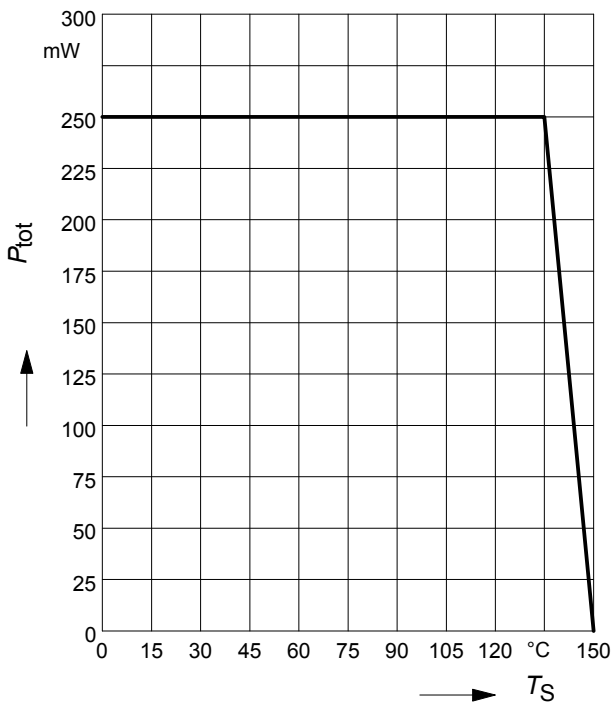
Total power dissipation $P_{tot} = f(T_S)$

BCR166F



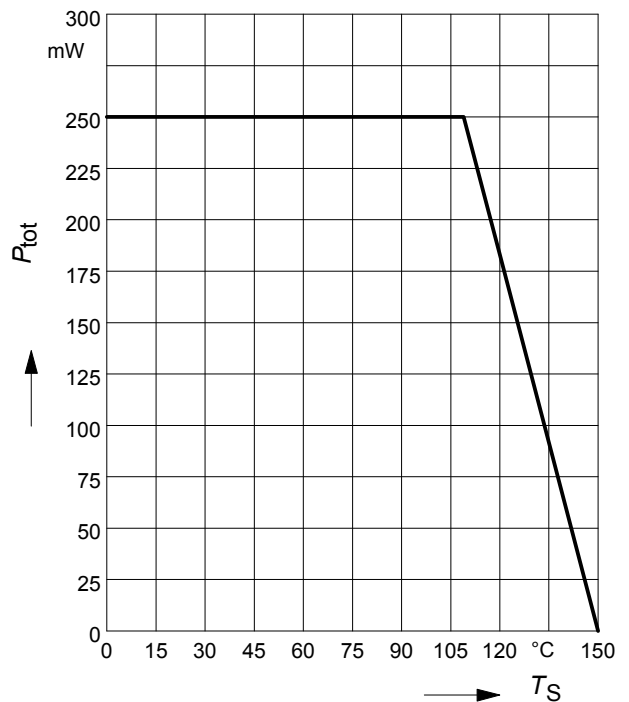
Total power dissipation $P_{tot} = f(T_S)$

BCR166L3



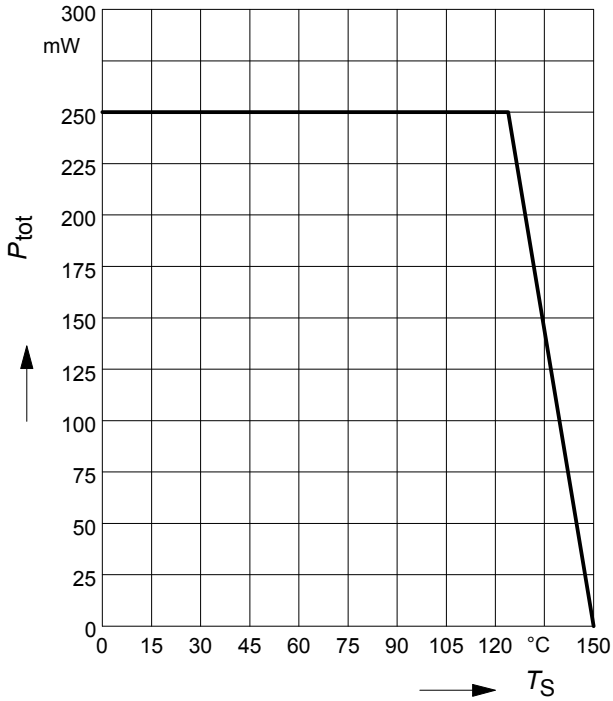
Total power dissipation $P_{tot} = f(T_S)$

BCR166T



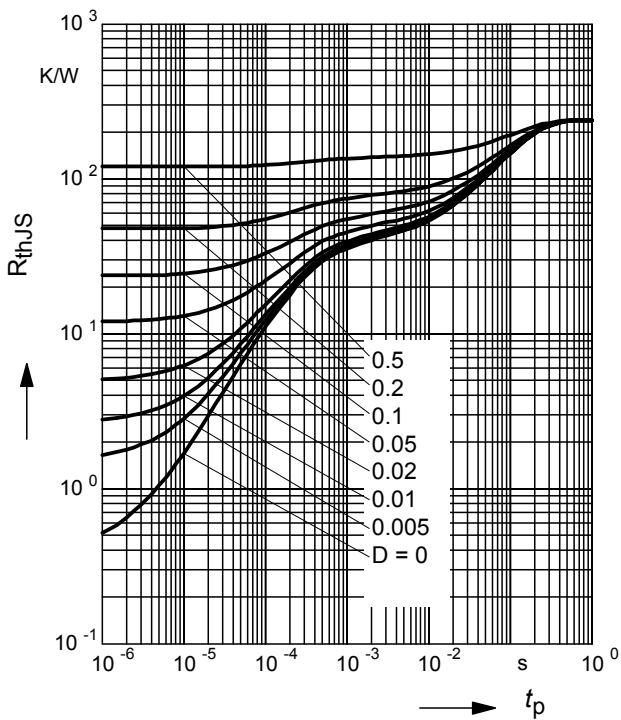
Total power dissipation $P_{tot} = f(T_S)$

BCR166W



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

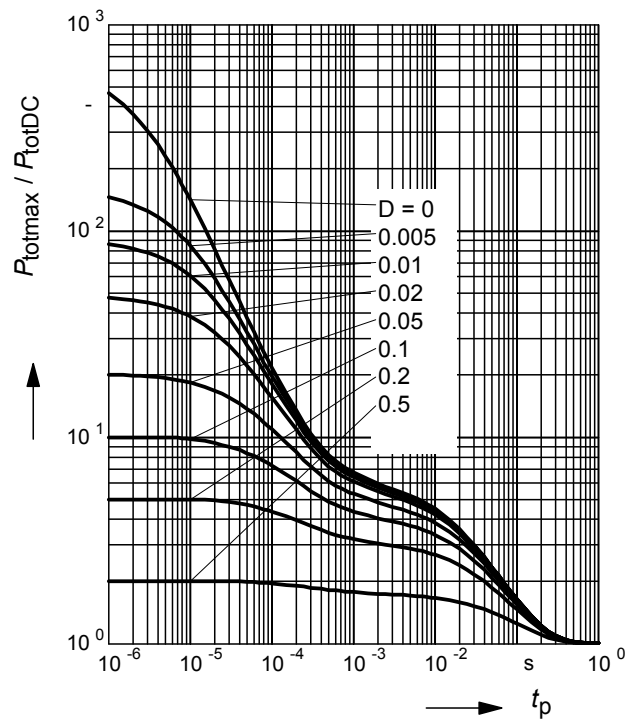
BCR166



Permissible Pulse Load

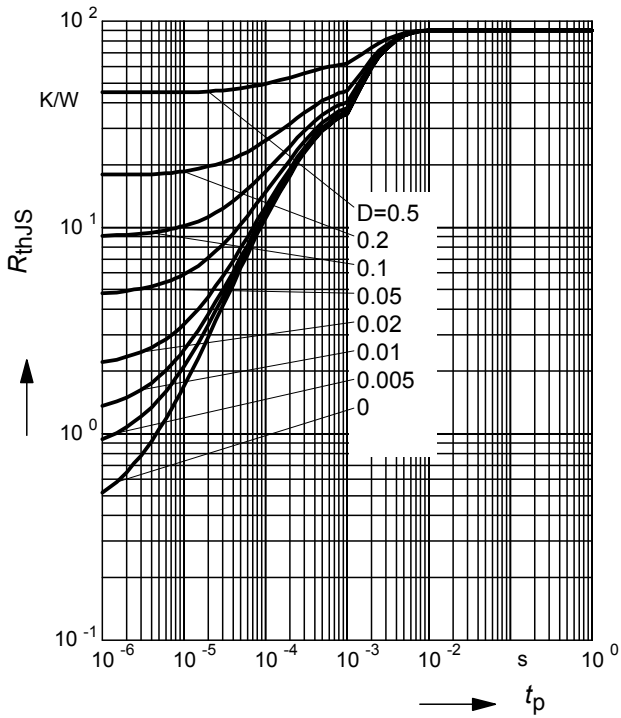
$P_{totmax} / P_{totDC} = f(t_p)$

BCR166



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

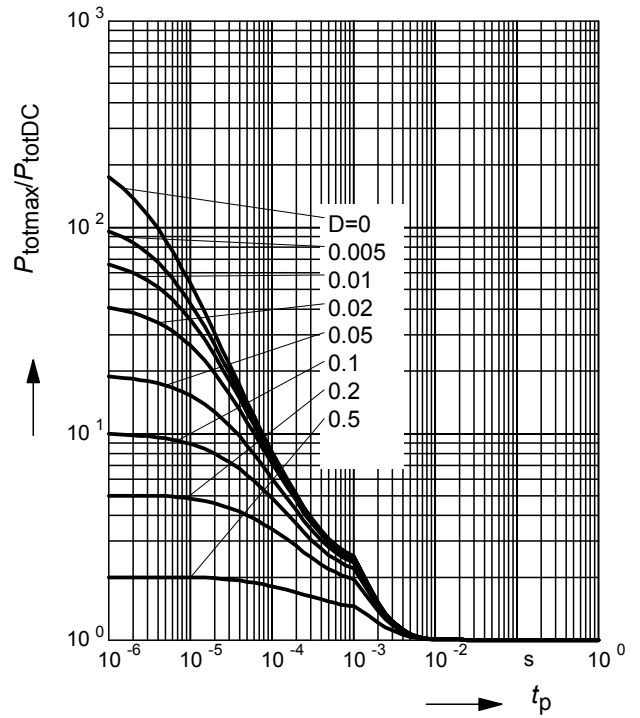
BCR166F



Permissible Pulse Load

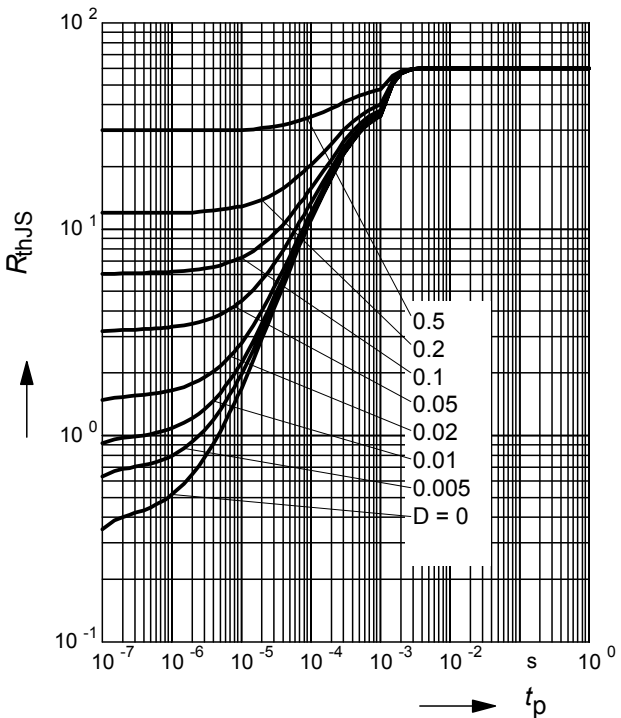
$P_{totmax}/P_{totDC} = f(t_p)$

BCR166F



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

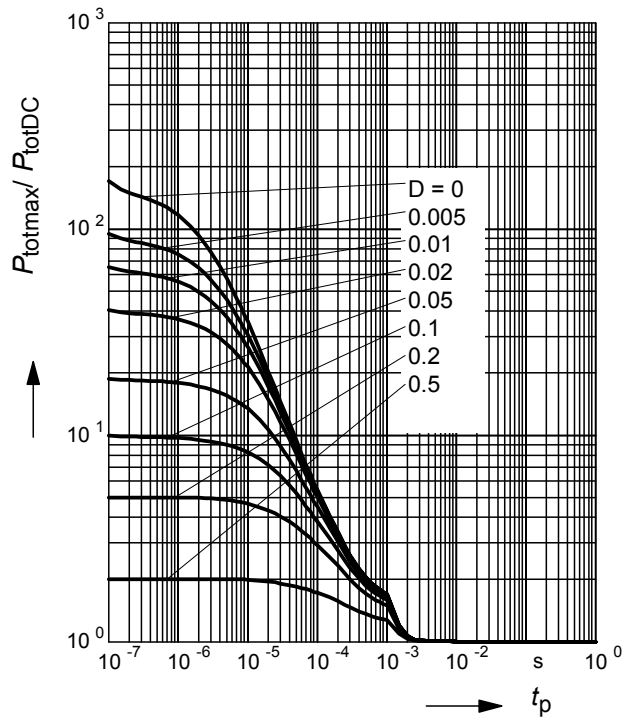
BCR166L3



Permissible Pulse Load

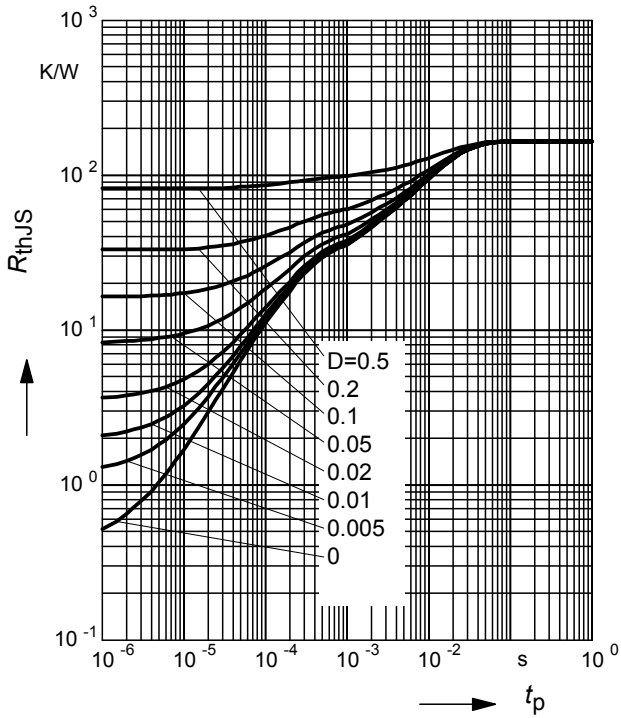
$P_{totmax}/P_{totDC} = f(t_p)$

BCR166L3



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

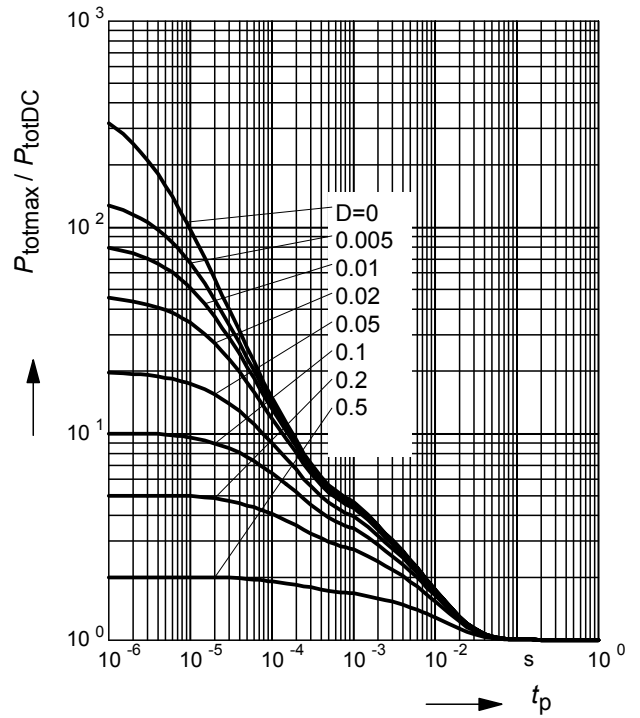
BCR166T



Permissible Pulse Load

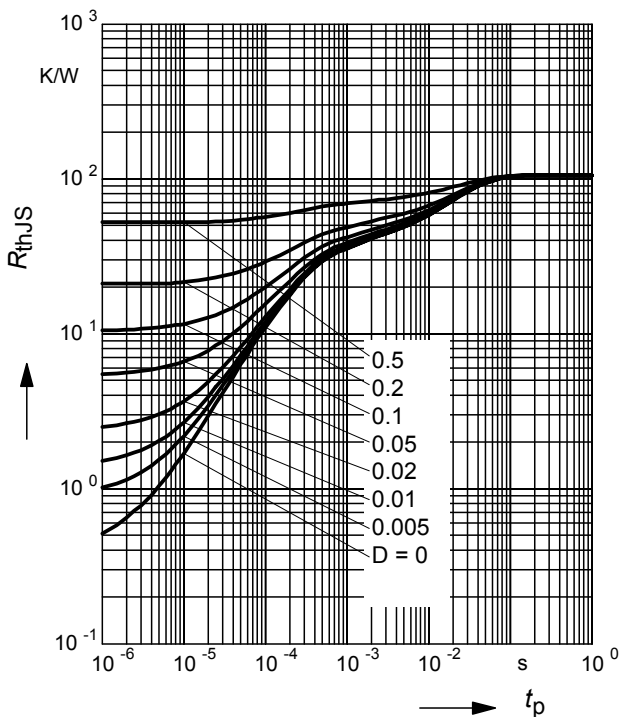
$P_{totmax}/P_{totDC} = f(t_p)$

BCR166T



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

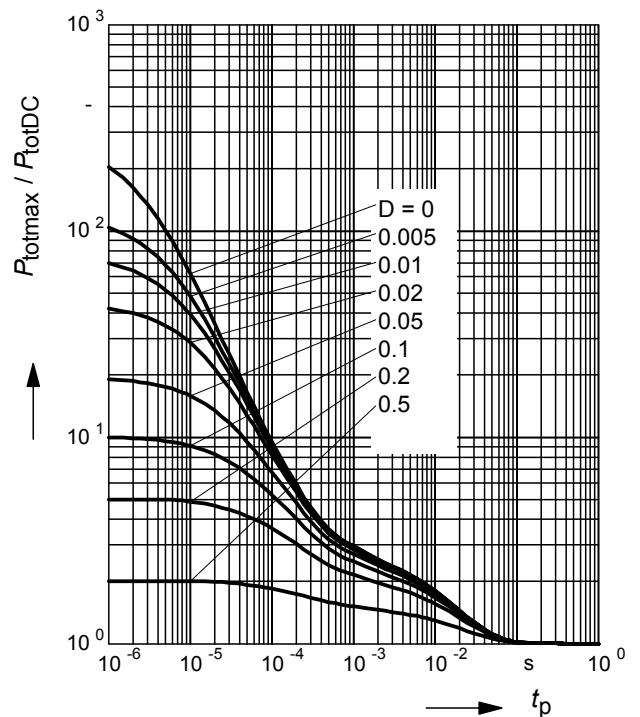
BCR166W



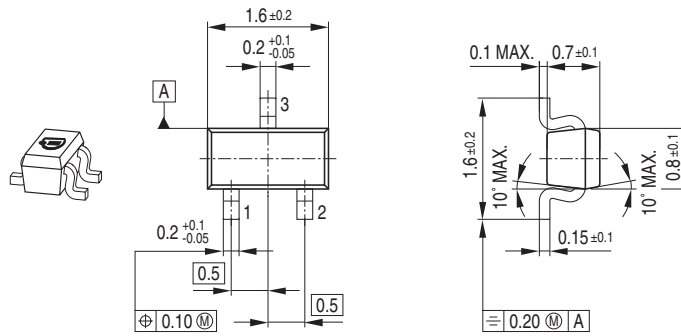
Permissible Pulse Load

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

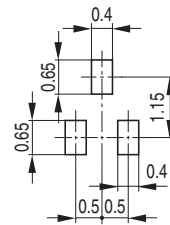
BCR166W



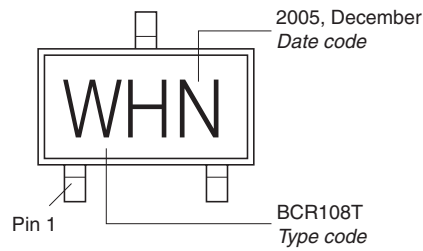
Package Outline



Foot Print

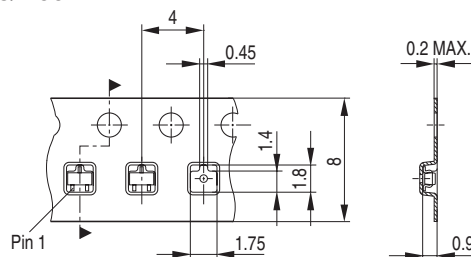


Marking Layout (Example)



Standard Packing

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

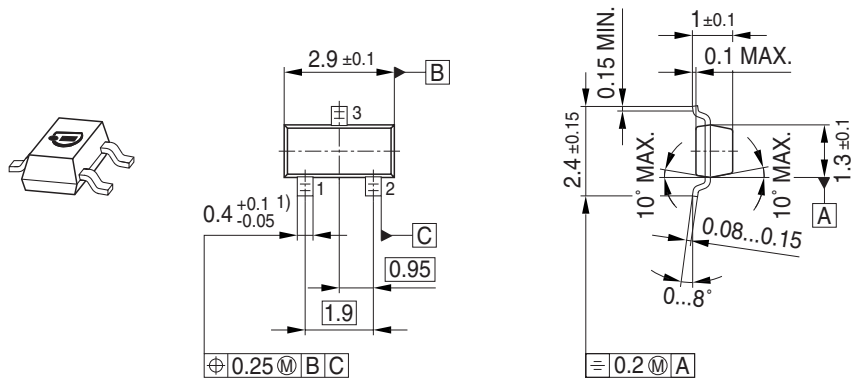


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75¹⁾) CES-Code

| Month | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 01 | a | p | A | P | a | p | A | P | a | p | A | P |
| 02 | b | q | B | Q | b | q | B | Q | b | q | B | Q |
| 03 | c | r | C | R | c | r | C | R | c | r | C | R |
| 04 | d | s | D | S | d | s | D | S | d | s | D | S |
| 05 | e | t | E | T | e | t | E | T | e | t | E | T |
| 06 | f | u | F | U | f | u | F | U | f | u | F | U |
| 07 | g | v | G | V | g | v | G | V | g | v | G | V |
| 08 | h | x | H | X | h | x | H | X | h | x | H | X |
| 09 | j | y | J | Y | j | y | J | Y | j | y | J | Y |
| 10 | k | z | K | Z | k | z | K | Z | k | z | K | Z |
| 11 | l | 2 | L | 4 | l | 2 | L | 4 | l | 2 | L | 4 |
| 12 | n | 3 | N | 5 | n | 3 | N | 5 | n | 3 | N | 5 |

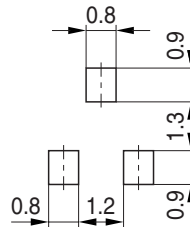
1) New Marking Layout for SC75, implemented at October 2005.

Package Outline

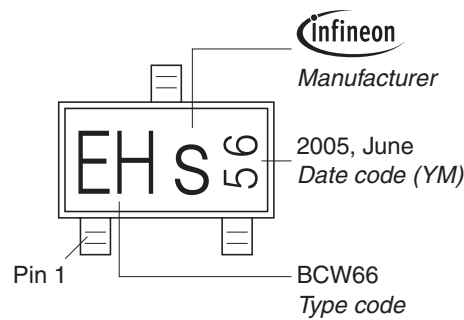


1) Lead width can be 0.6 max. in dambar area

Foot Print

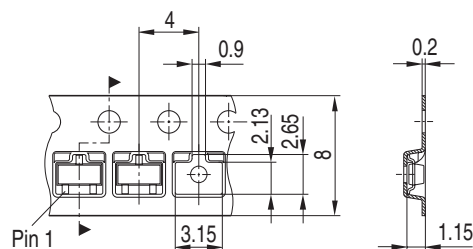


Marking Layout (Example)

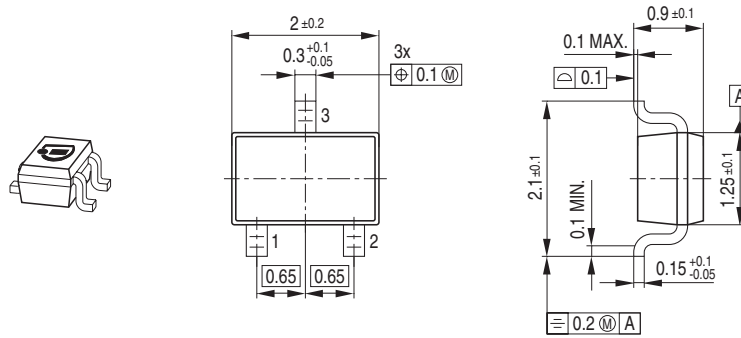


Standard Packing

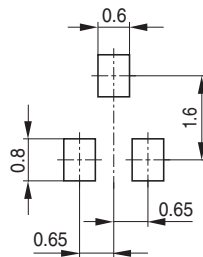
Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel



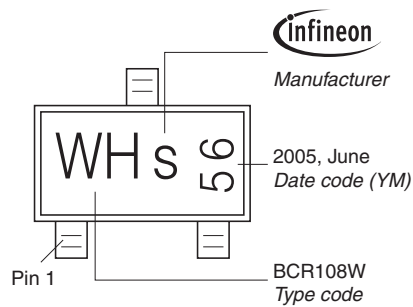
Package Outline



Foot Print

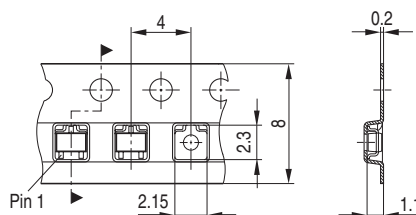


Marking Layout (Example)

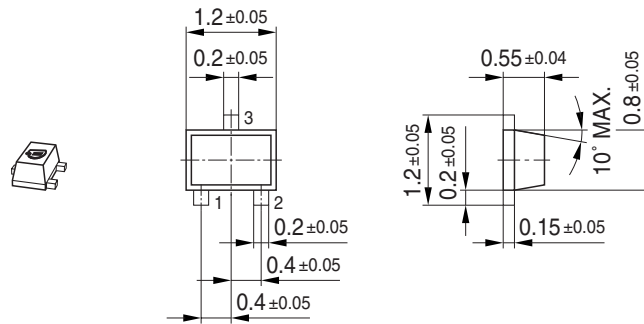


Standard Packing

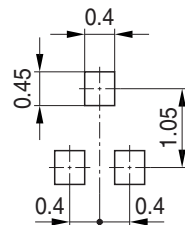
Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel



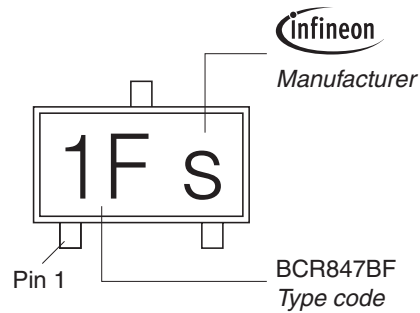
Package Outline



Foot Print

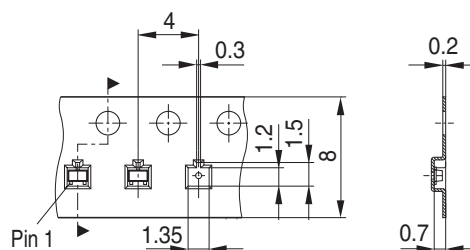


Marking Layout (Example)

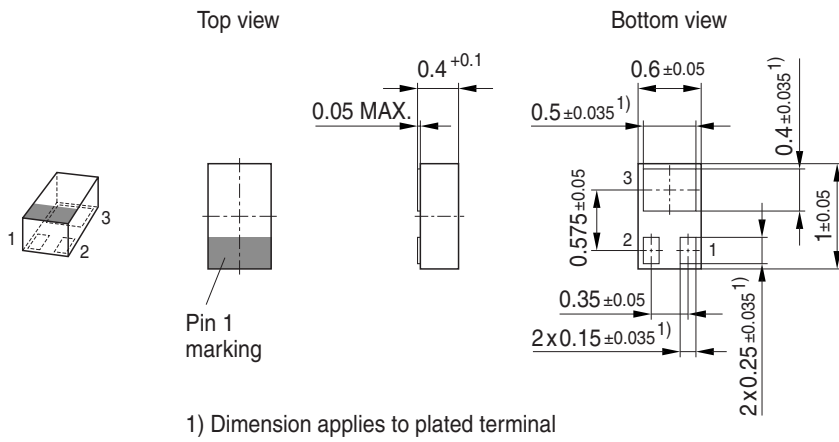


Standard Packing

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

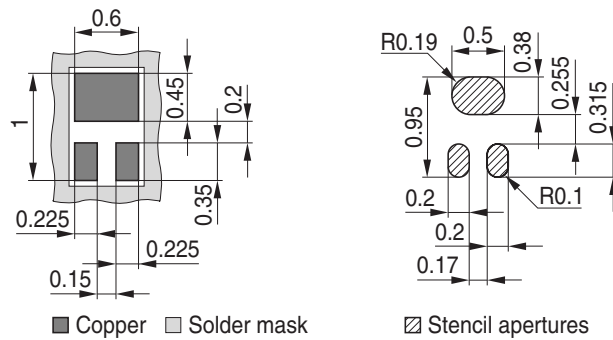


Package Outline

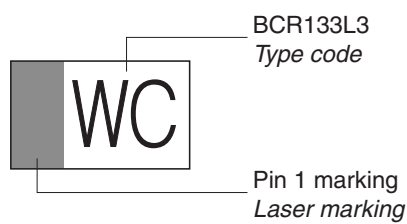


Foot Print

For board assembly information please refer to Infineon website "Packages"

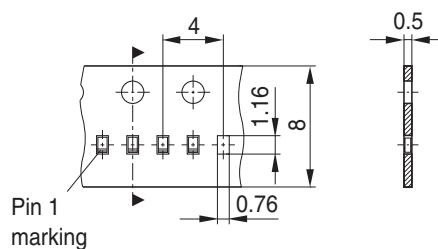


Marking Layout



Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



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