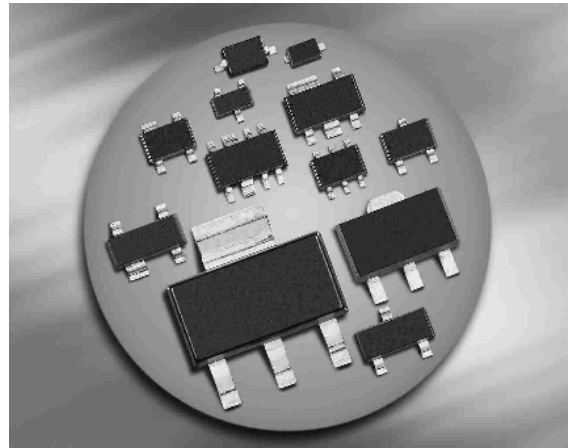
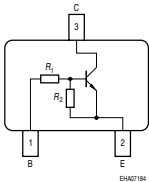


**NPN Silicon Digital Transistor**

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1 = 100k\Omega$  ,  $R_2 = 100k\Omega$  )


**BCR101F/L3  
BCR101T**


| Type      | Marking | Pin Configuration |     |     |   |   |   | Package  |
|-----------|---------|-------------------|-----|-----|---|---|---|----------|
|           |         | 1=B               | 2=E | 3=C | - | - | - |          |
| BCR101F*  | UCs     | 1=B               | 2=E | 3=C | - | - | - | TSFP-3   |
| BCR101L3* | UC      | 1=B               | 2=E | 3=C | - | - | - | TSLP-3-4 |
| BCR101T*  | UCs     | 1=B               | 2=E | 3=C | - | - | - | SC75     |

\*Preliminary

**Maximum Ratings**

| Parameter  | Symbol      | Value             | Unit |
|--|-------------|-------------------|------|
| Collector-emitter voltage  | $V_{CEO}$   | 50                | V    |
| Collector-base voltage   | $V_{CBO}$   | 50                |      |
| Emitter-base voltage   | $V_{EBO}$   | 10                |      |
| Input on voltage   | $V_{i(on)}$ | 50                |      |
| Collector current  | $I_C$       | 50                | mA   |
| Total power dissipation-<br>BCR101F, $T_S \leq 128^\circ\text{C}$<br>BCR101L3, $T_S \leq 135^\circ\text{C}$<br>BCR101T, $T_S \leq 109^\circ\text{C}$ | $P_{tot}$   | 250<br>250<br>250 | mW   |
| Junction temperature   | $T_j$       | 150               | °C   |
| Storage temperature  | $T_{stg}$   | -65 ... 150       |      |

**Thermal Resistance**

| Parameter                                | Symbol     | Value | Unit |
|--|------------|-------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ |       | K/W  |
| BCR101F                                  |            | ≤ 90  |      |
| BCR101L3                                 |            | ≤ 60  |      |
| BCR101T                                  |            | ≤ 165 |      |

**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>$I_C = 100 \mu\text{A}, I_B = 0$                         | $V_{(BR)CEO}$ | 50  | -   | -   | V             |
| Collector-base breakdown voltage<br>$I_C = 10 \mu\text{A}, I_E = 0$                             | $V_{(BR)CBO}$ | 50  | -   | -   |               |
| Collector-base cutoff current<br>$V_{CB} = 40 \text{V}, I_E = 0$                                | $I_{CBO}$     | -   | -   | 100 | nA            |
| Emitter-base cutoff current<br>$V_{EB} = 10 \text{V}, I_C = 0$                                  | $I_{EBO}$     | -   | -   | 75  | $\mu\text{A}$ |
| DC current gain <sup>2)</sup><br>$I_C = 5 \text{mA}, V_{CE} = 5 \text{V}$                       | $h_{FE}$      | 70  | -   | -   | -             |
| Collector-emitter saturation voltage <sup>2)</sup><br>$I_C = 5 \text{mA}, I_B = 0.25 \text{mA}$ | $V_{CEsat}$   | -   | -   | 0.3 | V             |
| Input off voltage<br>$I_C = 100 \mu\text{A}, V_{CE} = 5 \text{V}$                               | $V_{i(off)}$  | 0.5 | -   | 1.8 |               |
| Input on voltage<br>$I_C = 1 \text{mA}, V_{CE} = 0.3 \text{V}$                                  | $V_{i(on)}$   | 1   | -   | 3   |               |
| Input resistor  | $R_1$         | 70  | 100 | 130 | $k\Omega$     |
| Resistor ratio  | $R_1/R_2$     | 0.9 | 1   | 1.1 | -             |

**AC Characteristics**

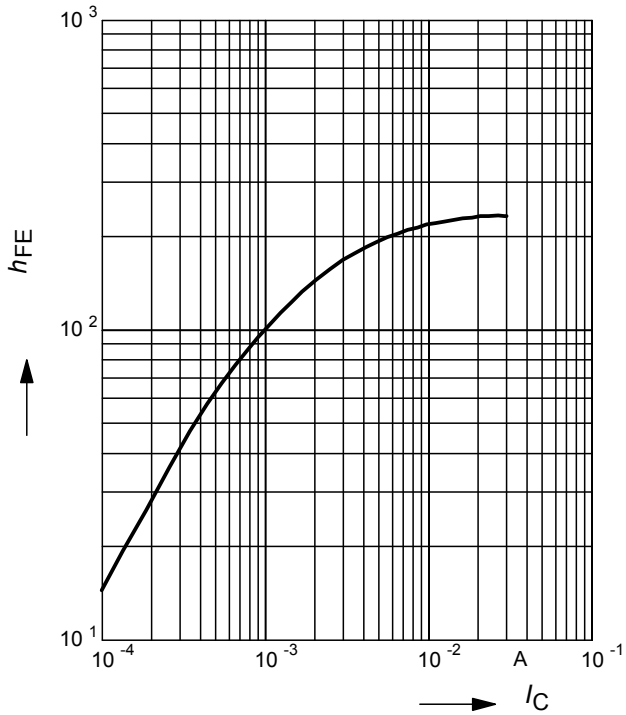
|   |          |   |     |   |     |
|---|----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 10 \text{mA}, V_{CE} = 5 \text{V}, f = 100 \text{MHz}$ | $f_T$    | - | 100 | - | MHz |
| Collector-base capacitance<br>$V_{CB} = 10 \text{V}, f = 1 \text{MHz}$                | $C_{cb}$ | - | 3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

<sup>1</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

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

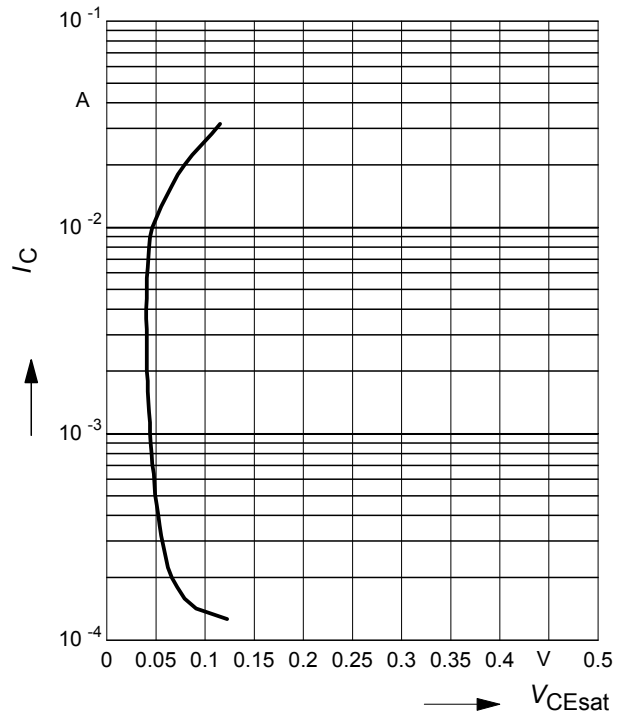
**DC current gain  $h_{FE} = f(I_C)$**

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



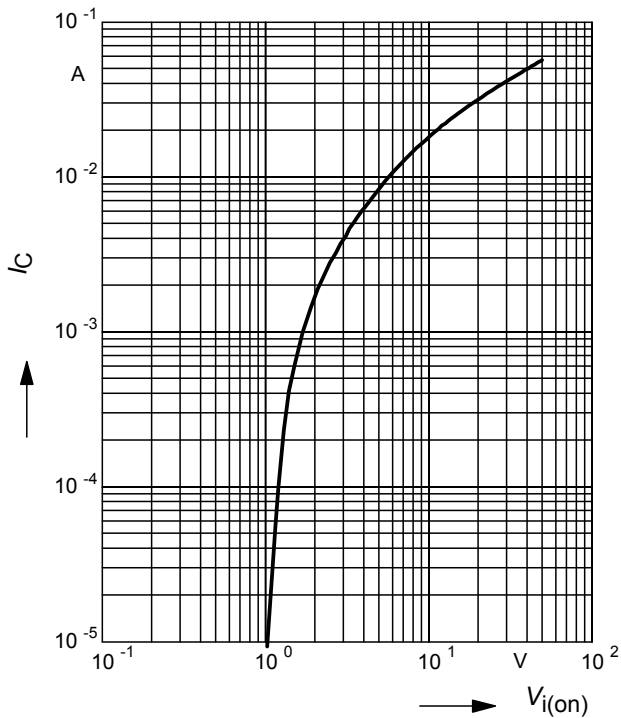
**Collector-emitter saturation voltage**

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



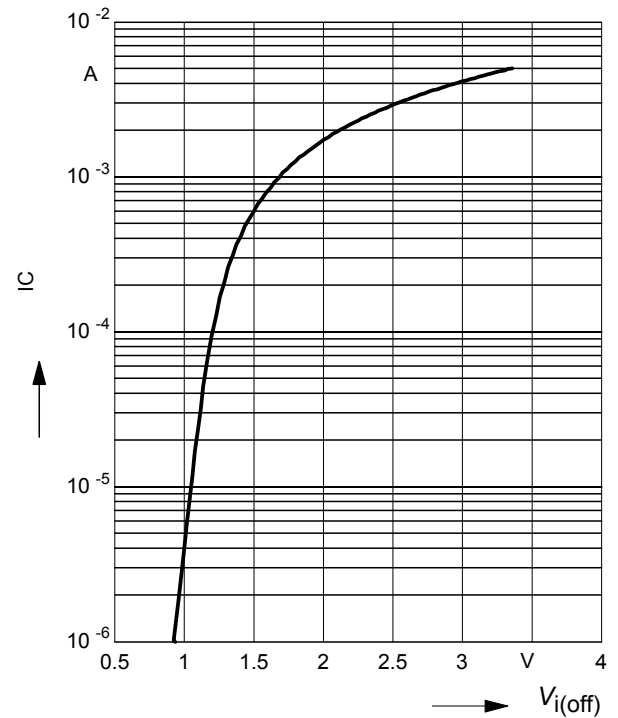
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



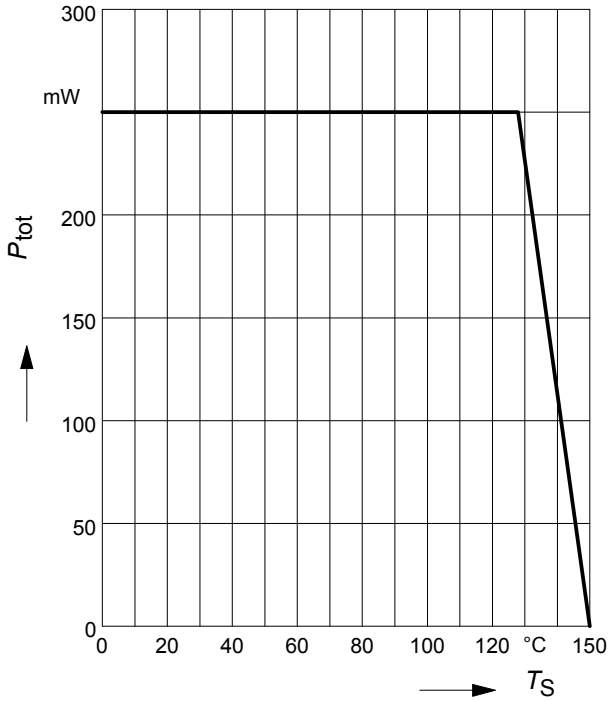
**Input off voltage  $V_{i(off)} = f(I_C)$**

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



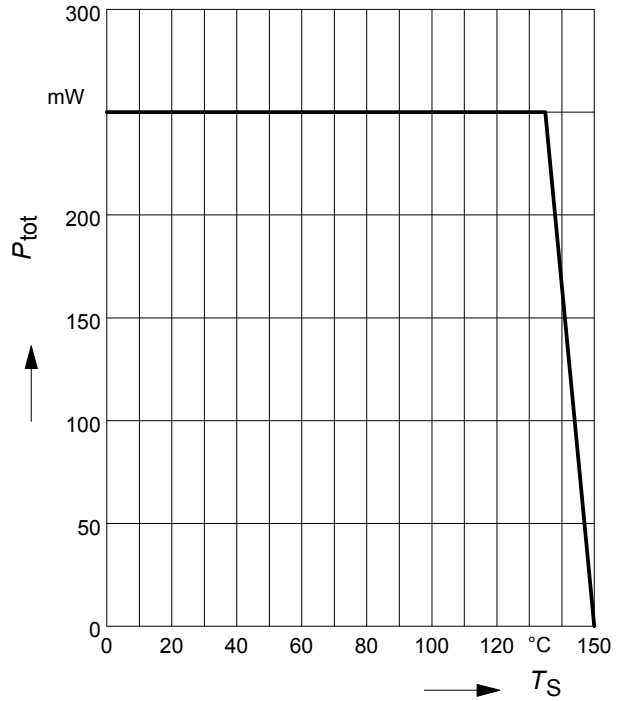
Total power dissipation  $P_{tot} = f(T_S)$

BCR101F



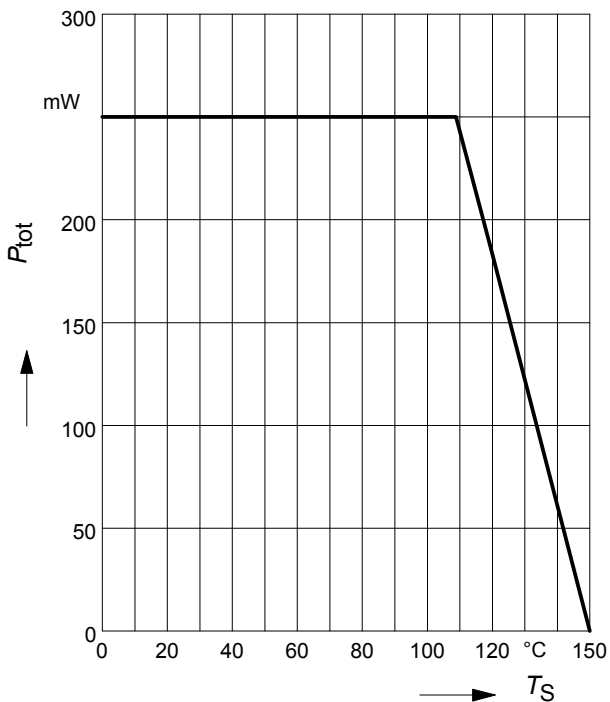
Total power dissipation  $P_{tot} = f(T_S)$

BCR101L3



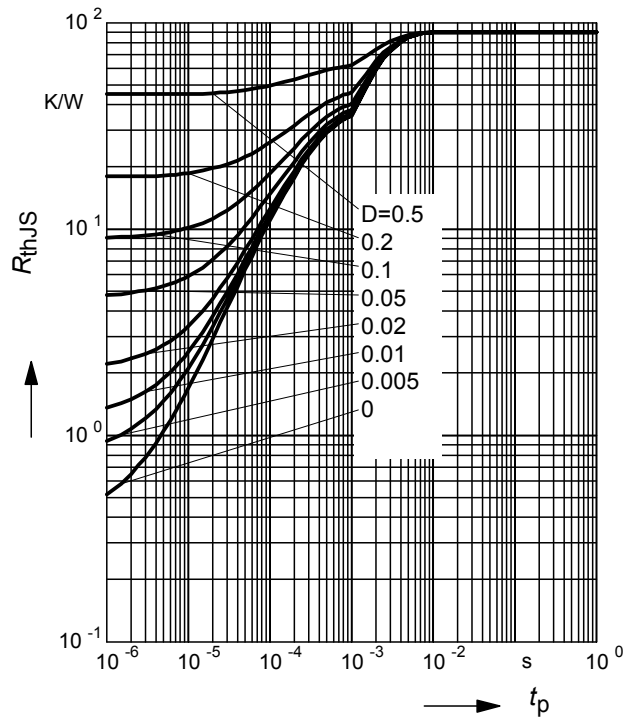
Total power dissipation  $P_{tot} = f(T_S)$

BCR101T



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

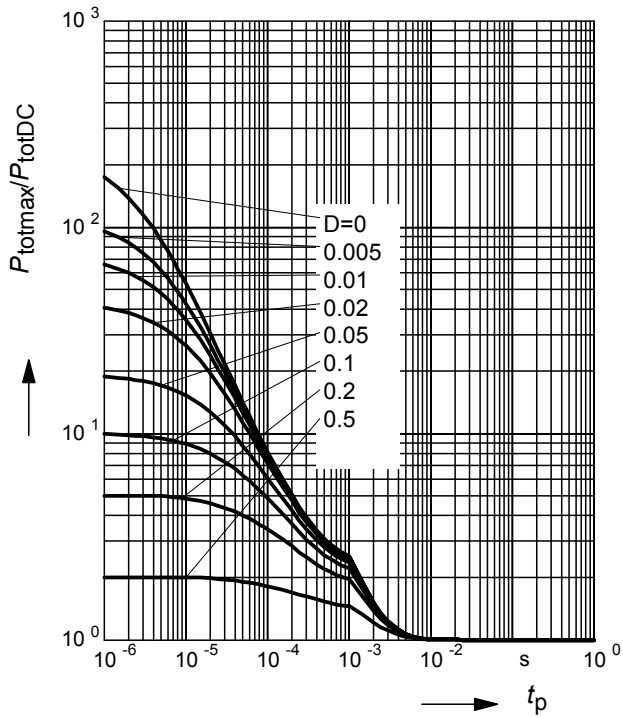
BCR101F



**Permissible Pulse Load**

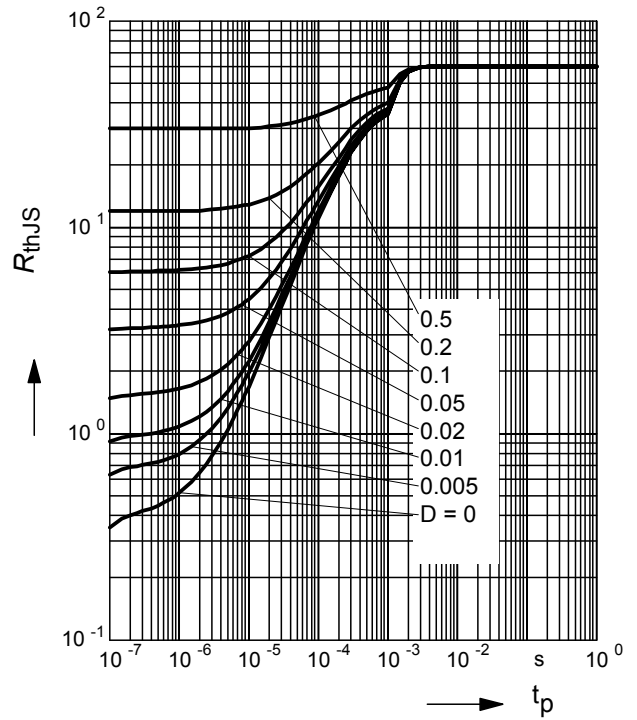
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR101F



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

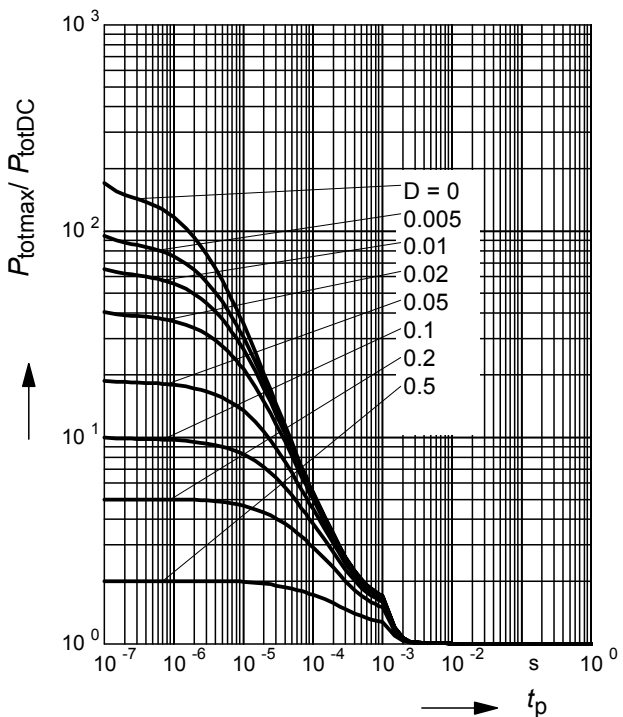
BCR101L3



**Permissible Pulse Load**

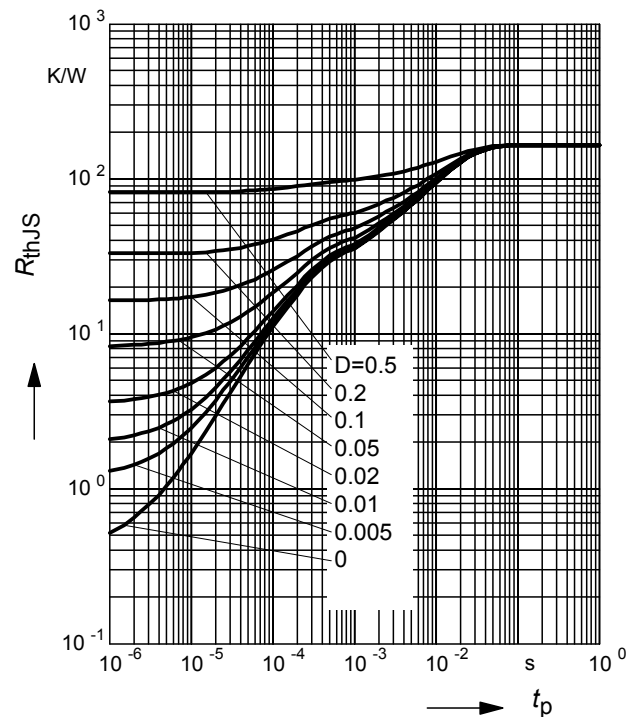
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR101L3



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

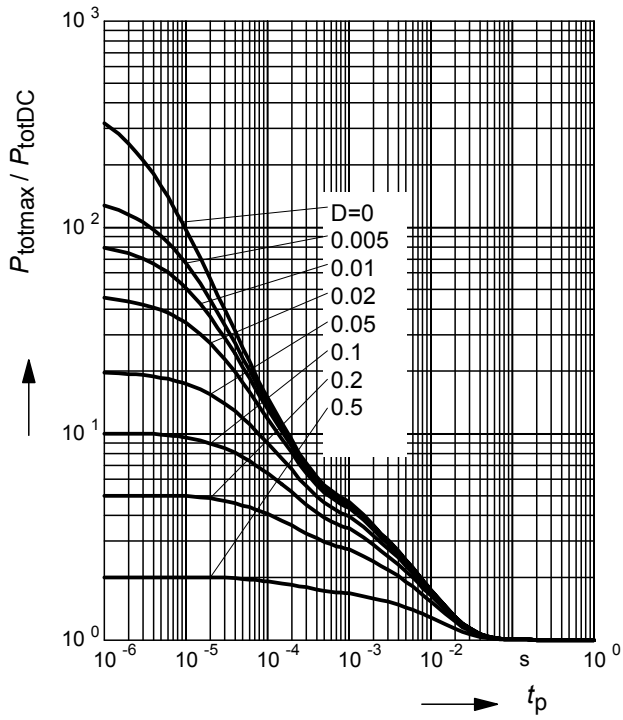
BCR101T



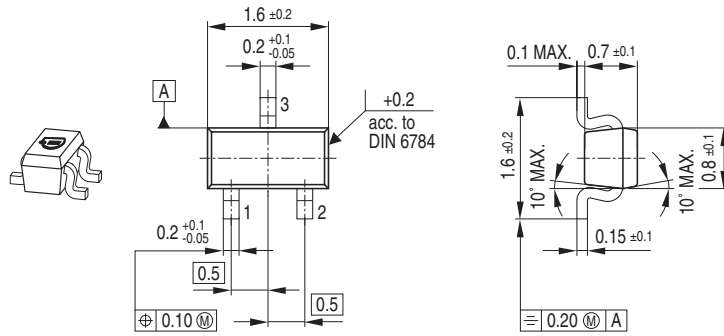
**Permissible Pulse Load**

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

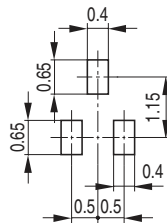
BCR101T



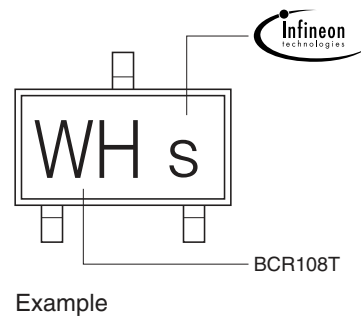
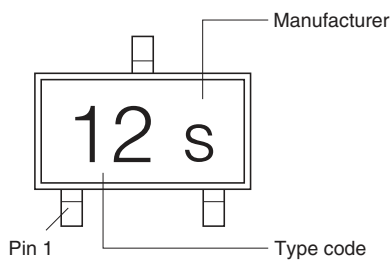
### Package Outline



### Foot Print

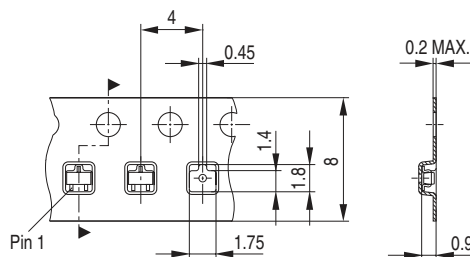


### Marking Layout

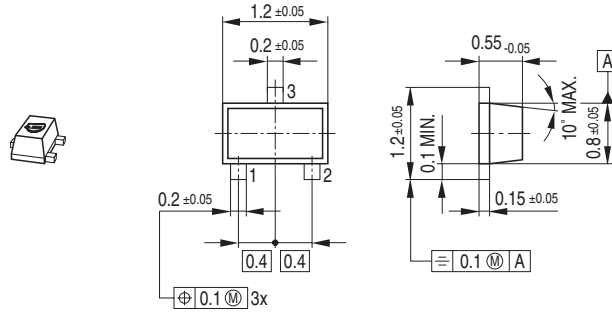


### Packing

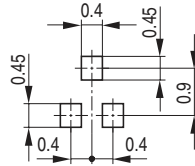
Code E6327: Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Code E6433: Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel



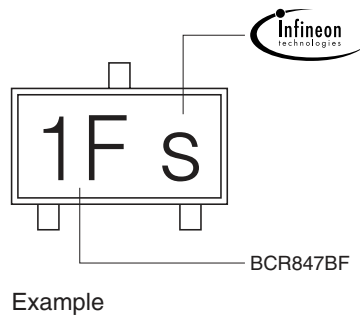
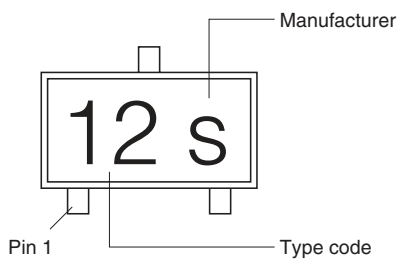
### Package Outline



### Foot Print

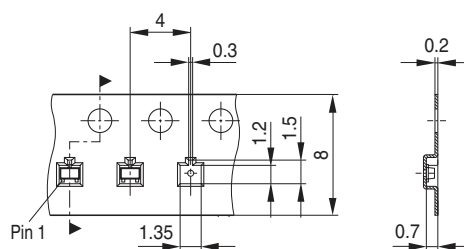


### Marking Layout



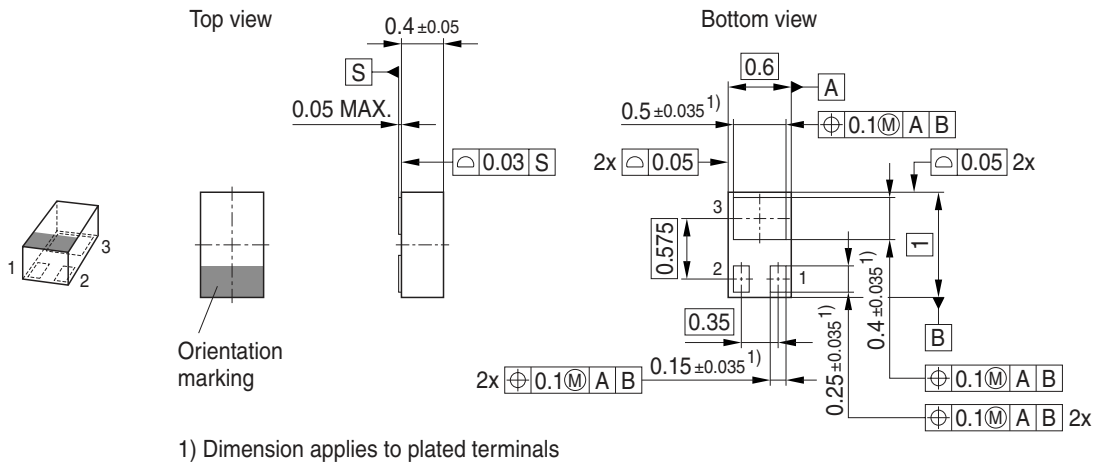
### Packing

Code E6327: Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Code E6433: Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel

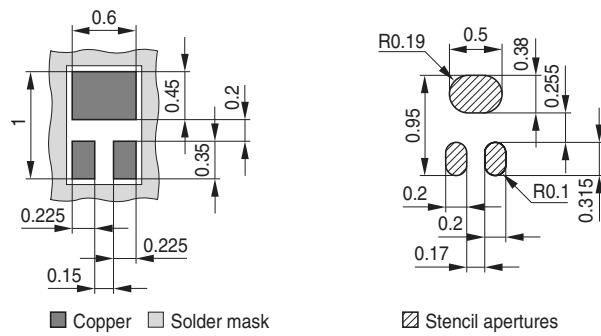




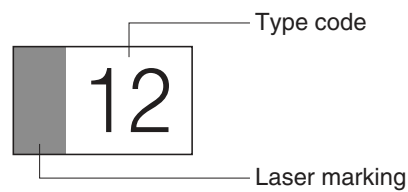
### Package Outline



### Foot Print

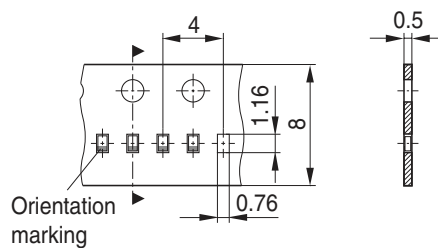


### Marking Layout



### Packing

Code E6327: Reel  $\varnothing 180$  mm = 15.000 Pieces/Reel



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