

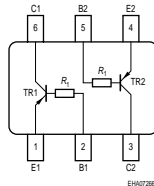
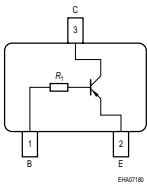
### PNP Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1 = 4.7 \text{ k}\Omega$ )
- BCR169S: Two internally isolated transistors with good matching in one multichip package
- BCR169S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package <sup>1)</sup>
- Qualified according AEC Q101



#### BCR169/F/W

#### BCR169S



| Type    | Marking | Pin Configuration |      |      |      |      |      | Package |
|---------|---------|-------------------|------|------|------|------|------|---------|
| BCR169  | WSs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT23   |
| BCR169F | WSs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSFP-3  |
| BCR169S | WSs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363  |
| BCR169W | WSs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT323  |

<sup>1</sup>Pb-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                 | $V_{i(fwd)}$ | 30          |      |     |
| Input reverse voltage                 | $V_{i(rev)}$ | 5           |      |     |
| Collector current                     | $I_C$        | 100         | mA   |     |
| Total power dissipation               | $P_{tot}$    |             | mW   |     |
| BCR169, $T_S \leq 102^\circ\text{C}$  |              |             |      | 200 |
| BCR169F, $T_S \leq 128^\circ\text{C}$ |              |             |      | 250 |
| BCR169S, $T_S \leq 115^\circ\text{C}$ |              |             |      | 250 |
| BCR169W, $T_S \leq 124^\circ\text{C}$ |              |             |      | 250 |
| Junction temperature                  | $T_j$        | 150         | °C   |     |
| Storage temperature                   | $T_{stg}$    | -65 ... 150 |      |     |

**Thermal Resistance**

| Parameter                                | Symbol     | Value | Unit |            |
|--|------------|-------|------|------------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ |       | K/W  |            |
| BCR169                                   |            |       |      | $\leq 240$ |
| BCR169F                                  |            |       |      | $\leq 90$  |
| BCR169S                                  |            |       |      | $\leq 140$ |
| BCR169W                                  |            |       |      | $\leq 105$ |

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

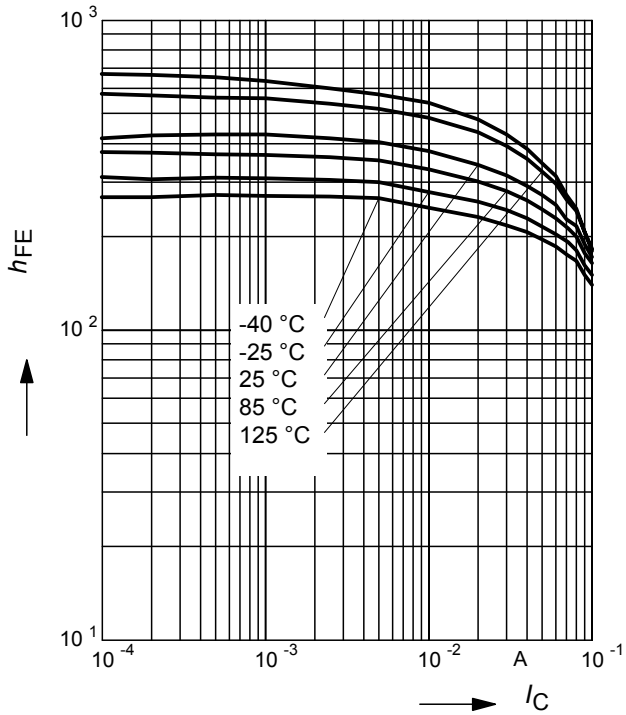
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

| Parameter   | Symbol        | Values |      |      | Unit       |
|---|---------------|--------|------|------|------------|
|   |               | min.   | typ. | max. |            |
| <b>DC Characteristics</b>   |               |        |      |      |            |
| 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>$V_{EB} = 5 \text{ V}, I_C = 0$                                    | $I_{EBO}$     | -      | -    | 100  | nA         |
| DC current gain <sup>1)</sup><br>$I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$                       | $h_{FE}$      | 120    | -    | 630  | -          |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$ | $V_{CEsat}$   | -      | -    | 0.3  | V          |
| Input off voltage<br>$I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$                                | $V_{i(off)}$  | 0.4    | -    | 0.8  |            |
| Input on voltage<br>$I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$                                  | $V_{i(on)}$   | 0.5    | -    | 1.1  |            |
| Input resistor  | $R_1$         | 3.2    | 4.7  | 6.2  | k $\Omega$ |
| <b>AC Characteristics</b>   |               |        |      |      |            |
| Transition frequency<br>$I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$          | $f_T$         | -      | 200  | -    | MHz        |
| Collector-base capacitance<br>$V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$                          | $C_{cb}$      | -      | 3    | -    | pF         |

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

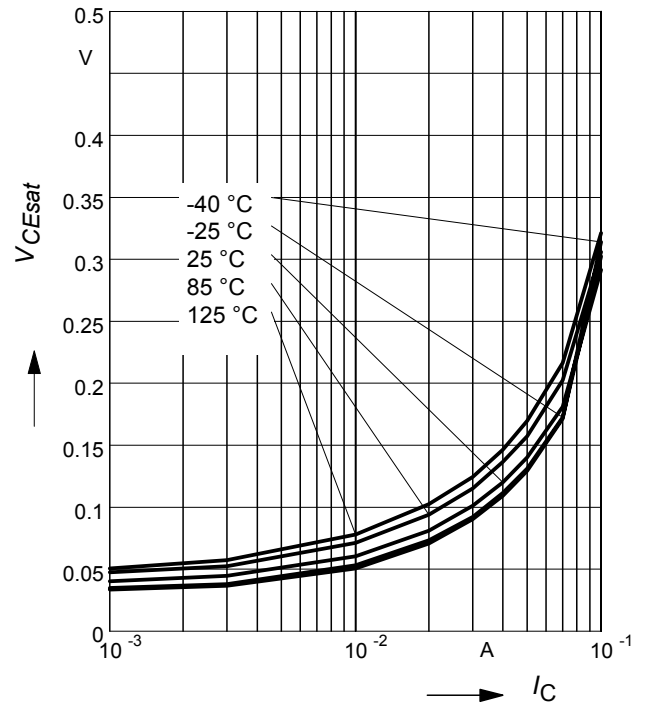
**DC current gain  $h_{FE} = f(I_C)$**

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



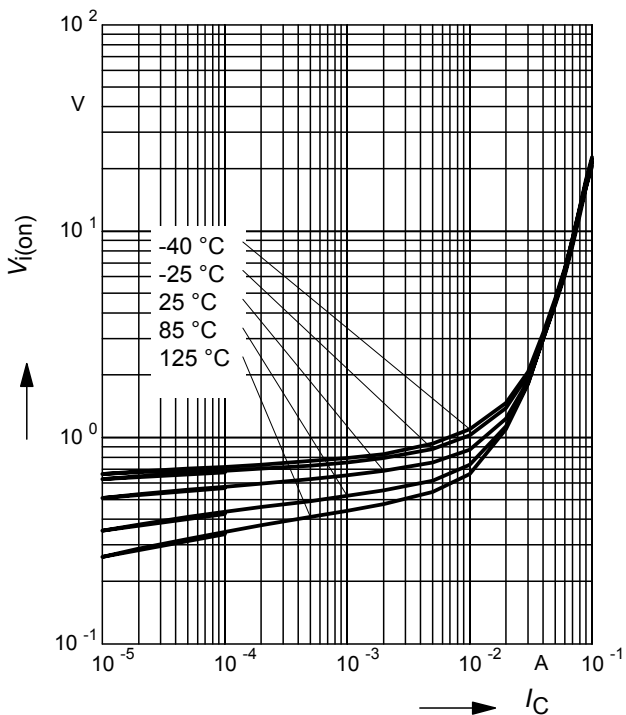
**Collector-emitter saturation voltage**

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



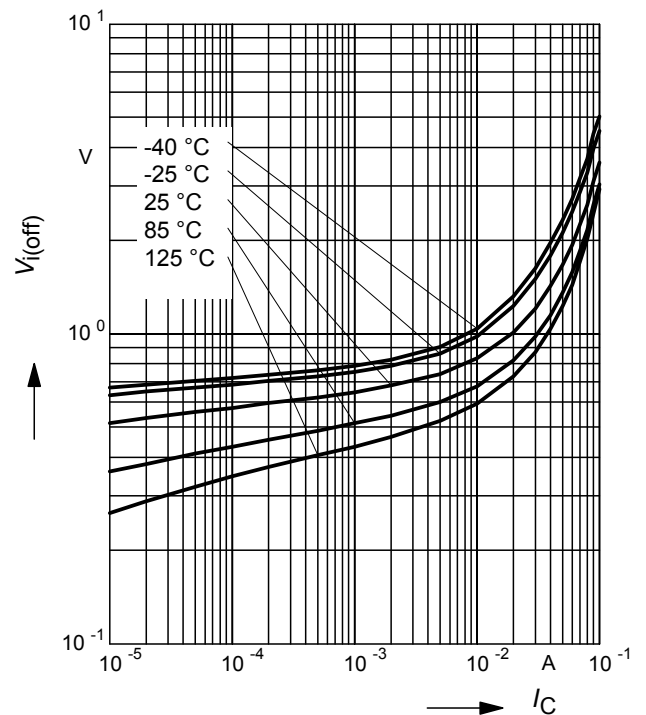
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



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

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



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

BCR169



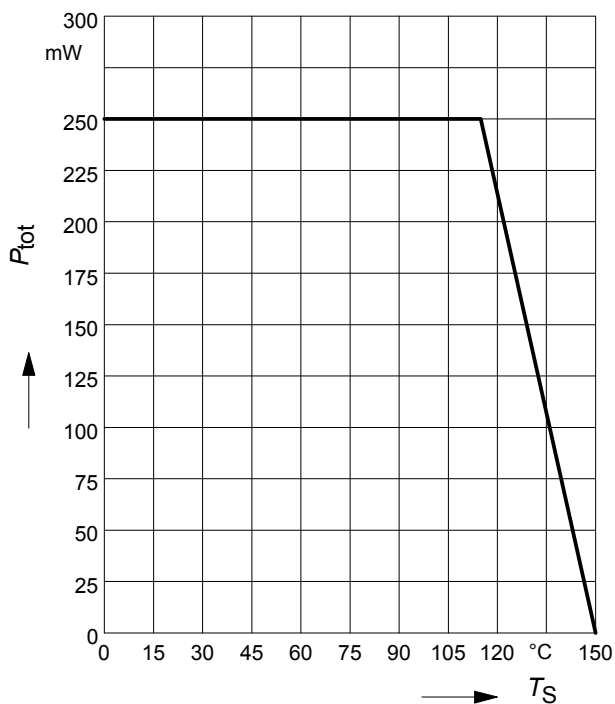
Total power dissipation  $P_{tot} = f(T_S)$

BCR169F



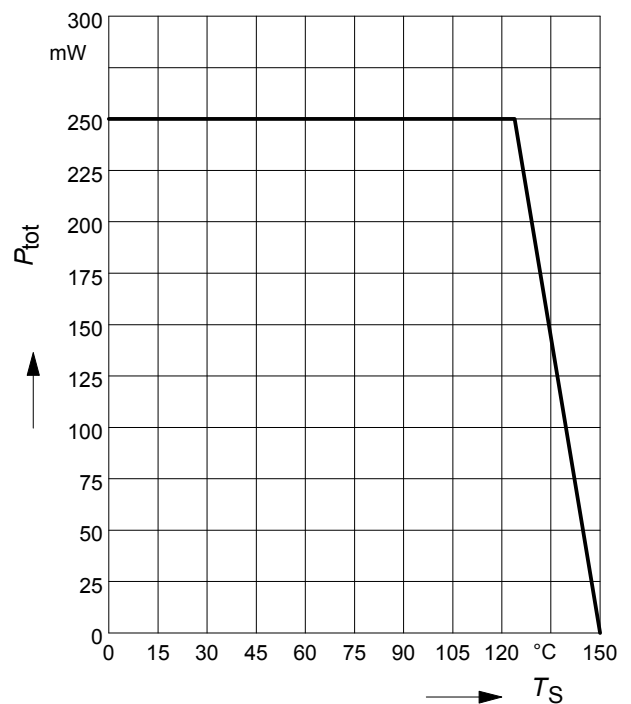
Total power dissipation  $P_{tot} = f(T_S)$

BCR169S



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

BCR169W



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

BCR169



**Permissible Pulse Load**

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

BCR169



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

BCR169F



**Permissible Pulse Load**

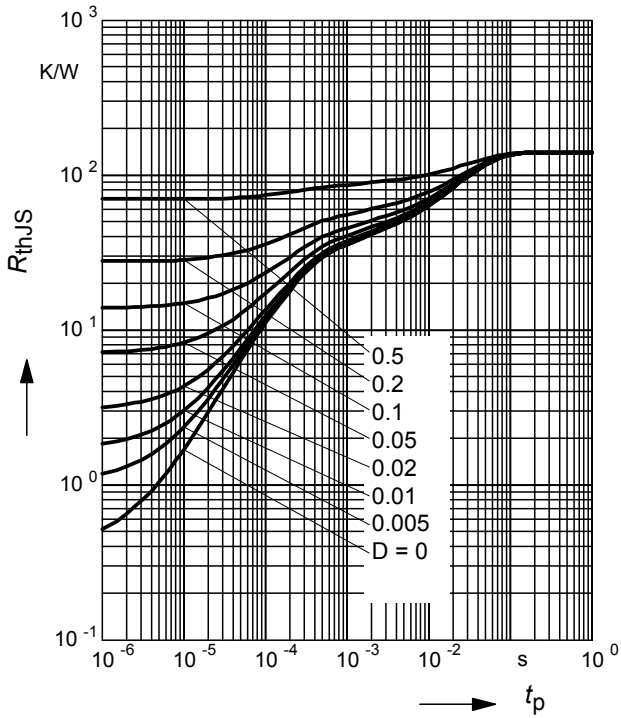
$P_{totmax}/P_{totDC} = f(t_p)$

BCR169F



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

BCR169S



**Permissible Pulse Load**

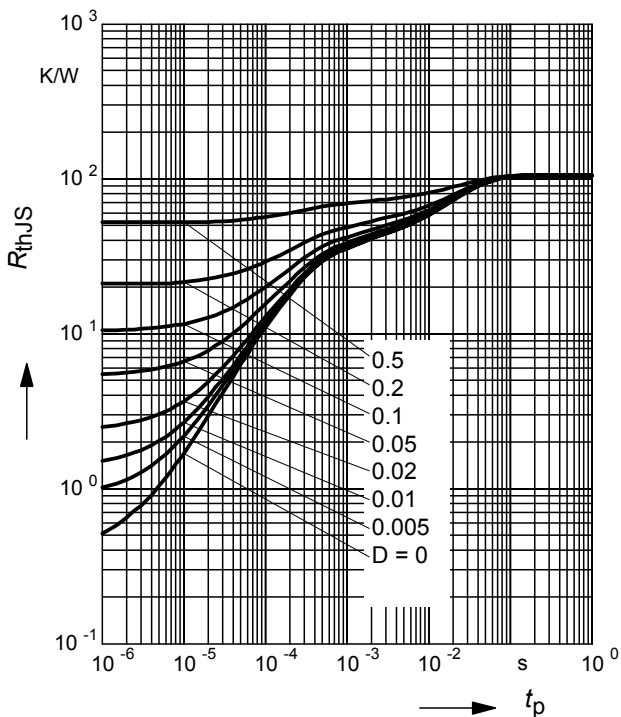
$P_{totmax}/P_{totDC} = f(t_p)$

BCR169S



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

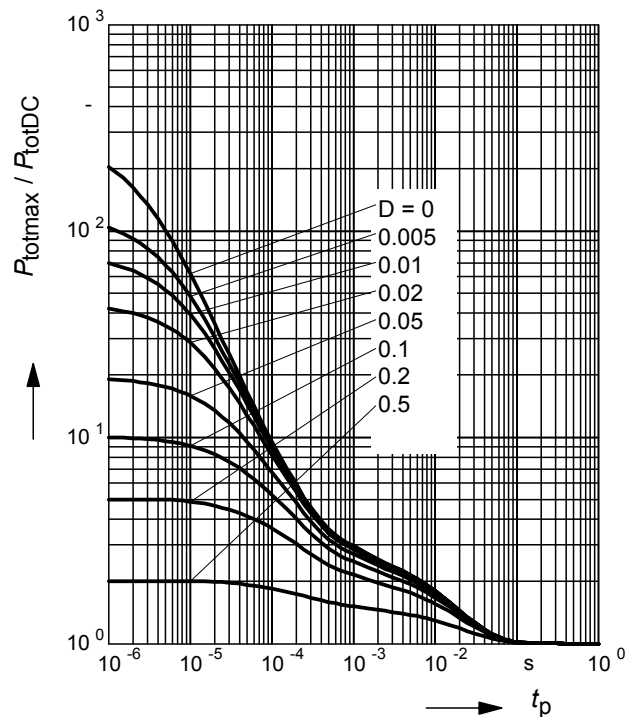
BCR169W



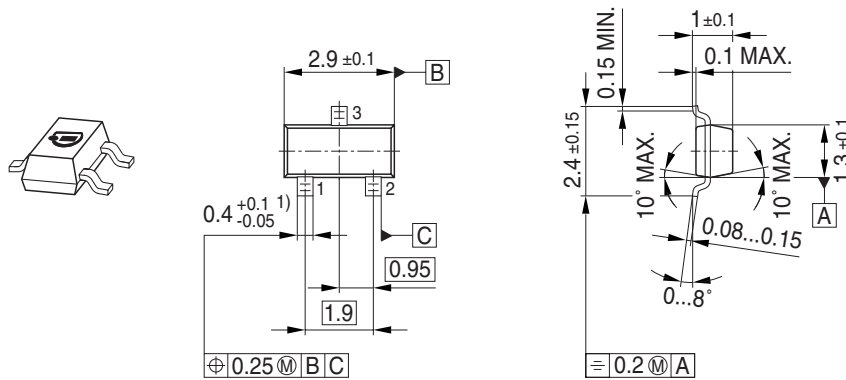
**Permissible Pulse Load**

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

BCR169W

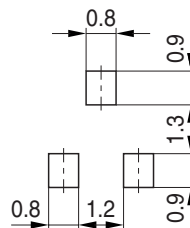


Package Outline



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

Foot Print

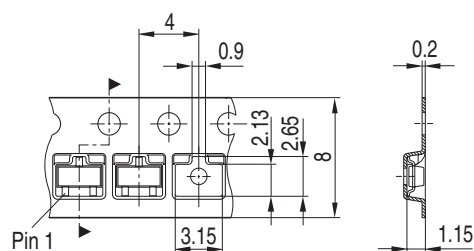


Marking Layout (Example)



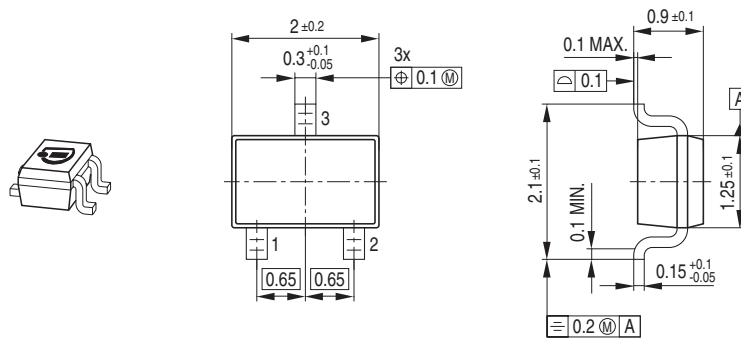
Standard Packing

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





Package Outline



Foot Print

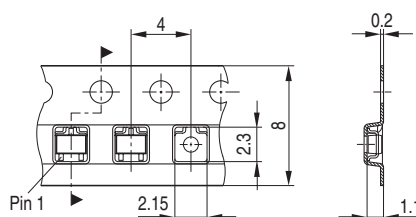


Marking Layout (Example)



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)

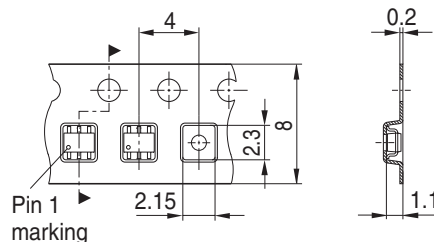
Small variations in positioning of Date code, Type code and Manufacture are possible.



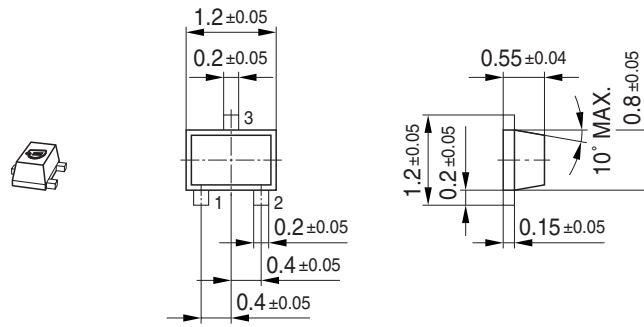
Standard Packing

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

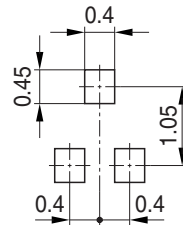
For symmetric types no defined Pin 1 orientation in reel.



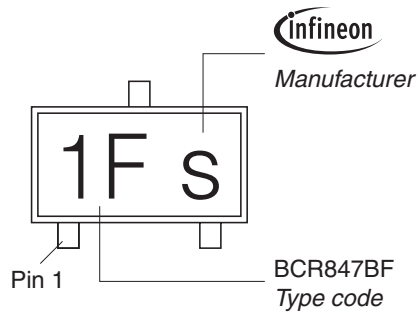
Package Outline



Foot Print

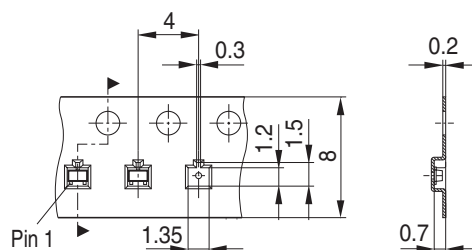


Marking Layout (Example)



Standard Packing

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



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