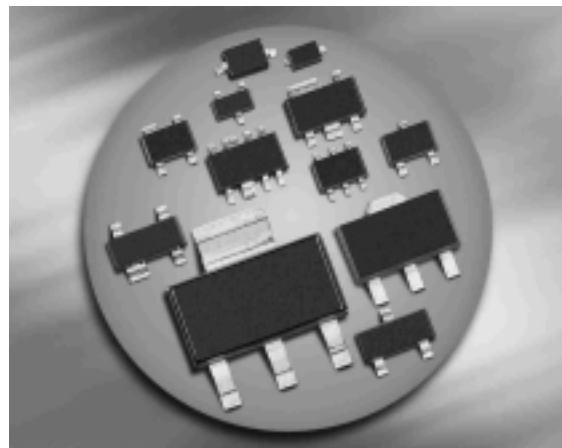


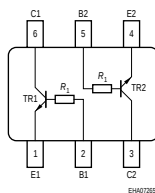
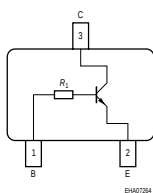
## NPN silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in resistor ( $R_1=4.7\text{ k}\Omega$ )
- BCR119S: Two internally isolated transistors with good matching in one multichip package
- BCR119S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package<sup>1)</sup>
- Qualified according AEC Q101



### BCR119/F/W

### BCR119S



| Type    | Marking | Pin Configuration |      |      |      |      |      | Package |
|---------|---------|-------------------|------|------|------|------|------|---------|
| BCR119  | WKs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT23   |
| BCR119F | WKs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSFP-3  |
| BCR119S | WKs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363  |
| BCR119W | WKs     | 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                        |      |
| DC collector current                                                                                                                                                                        | $I_E$        | 100                      | mA   |
| Total power dissipation-<br>BCR119, $T_S \leq 102^\circ\text{C}$<br>BCR119F, $T_S \leq 128^\circ\text{C}$<br>BCR119S, $T_S \leq 115^\circ\text{C}$<br>BCR119W, $T_S \leq 124^\circ\text{C}$ | $P_{tot}$    | 200<br>250<br>250<br>250 | mW   |
| Junction temperature                                                                                                                                                                        | $T_j$        | 150                      |      |
| Storage temperature                                                                                                                                                                         | $T_{stg}$    | -65 ... 150              |      |

**Thermal Resistance**

| Parameter                                | Symbol     | Value      | Unit |
|------------------------------------------|------------|------------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ |            | K/W  |
| BCR119                                   |            | $\leq 240$ |      |
| BCR119F                                  |            | $\leq 90$  |      |
| BCR119S                                  |            | $\leq 140$ |      |
| BCR119W                                  |            | $\leq 105$ |      |

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

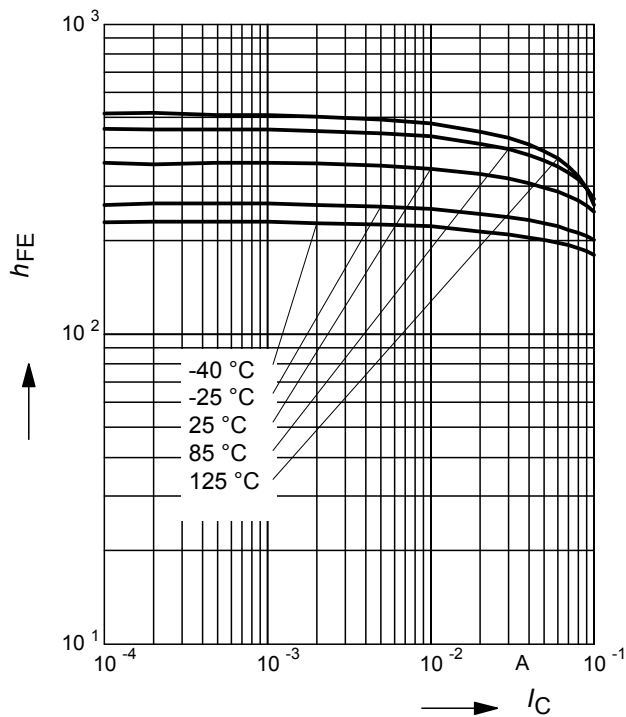
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                             | Symbol                      | Values |      |      | Unit |
|-------------------------------------------------------------------------------------------------------|-----------------------------|--------|------|------|------|
|                                                                                                       |                             | min.   | typ. | max. |      |
| DC Characteristics                                                                                    |                             |        |      |      |      |
| Collector-emitter breakdown voltage<br>$I_C = 100\ \mu\text{A}$ , $I_B = 0$                           | $V_{(\text{BR})\text{CEO}}$ | 50     | -    | -    | V    |
| Collector-base breakdown voltage<br>$I_C = 10\ \mu\text{A}$ , $I_E = 0$                               | $V_{(\text{BR})\text{CBO}}$ | 50     | -    | -    |      |
| Collector-base cutoff current<br>$V_{\text{CB}} = 40\ \text{V}$ , $I_E = 0$                           | $I_{\text{CBO}}$            | -      | -    | 100  | nA   |
| Emitter-base cutoff current<br>$V_{\text{EB}} = 5\ \text{V}$ , $I_C = 0$                              | $I_{\text{EBO}}$            | -      | -    | 100  | nA   |
| DC current gain <sup>1)</sup><br>$I_C = 5\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$                 | $h_{\text{FE}}$             | 120    | -    | 630  | -    |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 10\ \text{mA}$ , $I_B = 0.5\ \text{mA}$  | $V_{\text{CEsat}}$          | -      | -    | 0.3  | V    |
| Input off voltage<br>$I_C = 100\ \mu\text{A}$ , $V_{\text{CE}} = 5\ \text{V}$                         | $V_{\text{i(off)}}$         | 0.4    | -    | 0.8  |      |
| Input on voltage<br>$I_C = 2\ \text{mA}$ , $V_{\text{CE}} = 0.3\ \text{V}$                            | $V_{\text{i(on)}}$          | 0.5    | -    | 1.1  |      |
| Input resistor                                                                                        | $R_1$                       | 3.2    | 4.7  | 6.2  | kΩ   |
| AC Characteristics                                                                                    |                             |        |      |      |      |
| Transition frequency<br>$I_C = 10\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$ , $f = 100\ \text{MHz}$ | $f_{\text{T}}$              | -      | 150  | -    | MHz  |
| Collector-base capacitance<br>$V_{\text{CB}} = 10\ \text{V}$ , $f = 1\ \text{MHz}$                    | $C_{\text{cb}}$             | -      | 3    | -    | pF   |

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

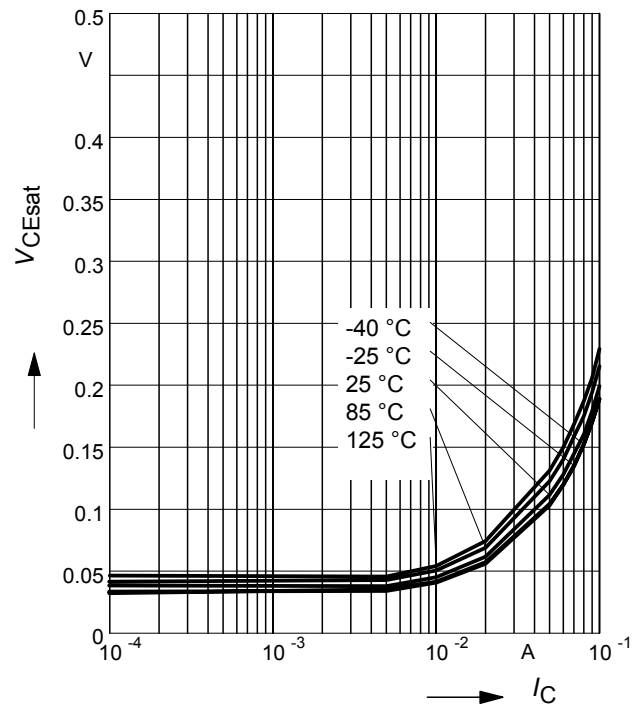
### DC current gain $h_{FE} = f(I_C)$

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



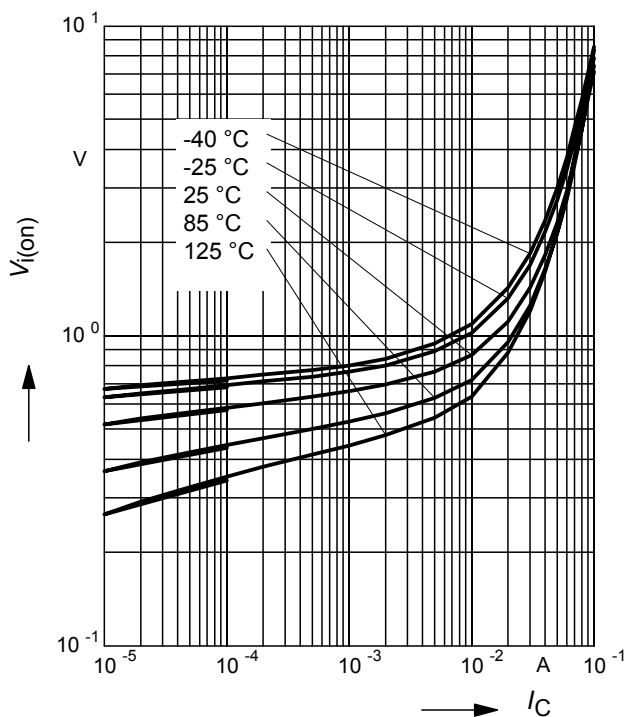
### Collector-emitter saturation voltage

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



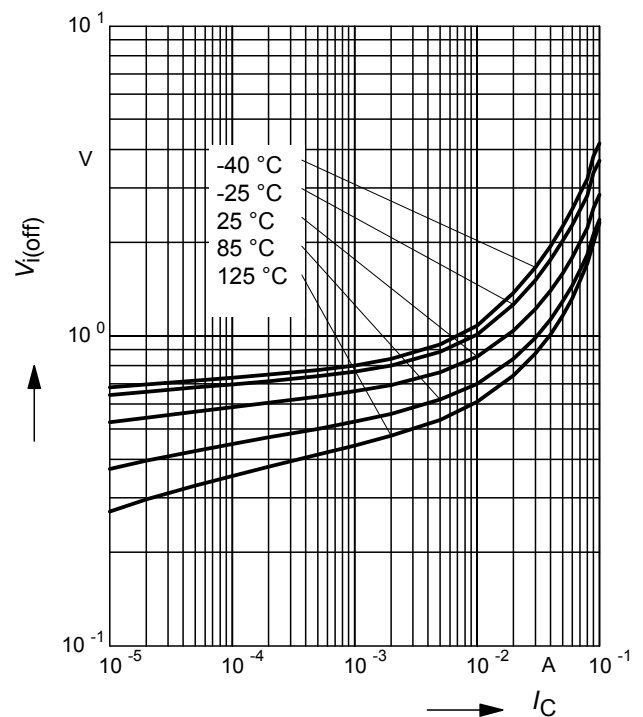
### Input on Voltage $V_{i(on)} = f(I_C)$

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



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

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



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

**BCR119**



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

**BCR119F**



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

**BCR119S**



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

**BCR119W**



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

BCR119



### Permissible Pulse Load

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

BCR119



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

BCR119F



### Permissible Pulse Load

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

BCR119F



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

BCR119S



### Permissible Pulse Load

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

BCR119S



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

BCR119W



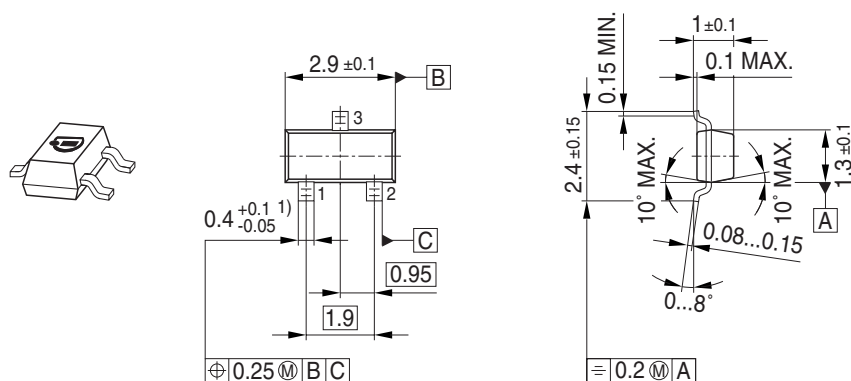
### Permissible Pulse Load

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

BCR119W



## Package Outline

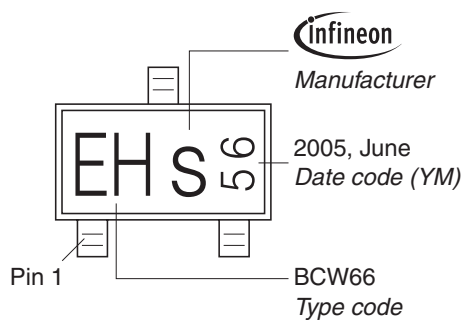


1) Lead width can be 0.6 max. in dambar area

## Foot Print

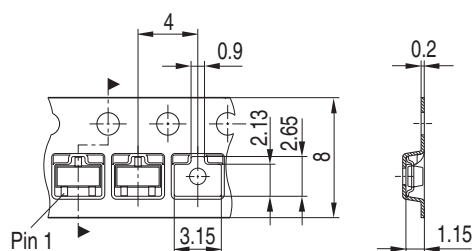


## Marking Layout (Example)

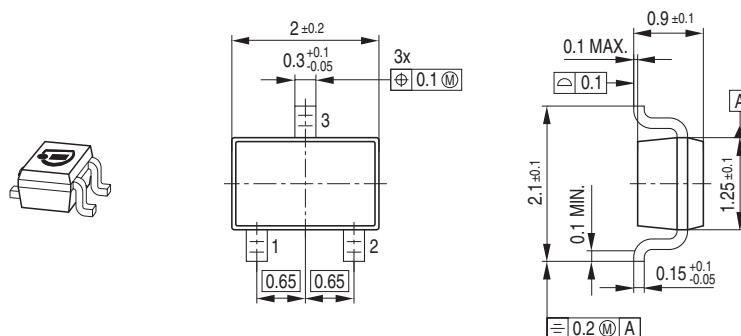


## Standard Packing

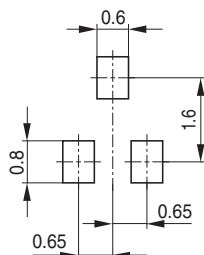
Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



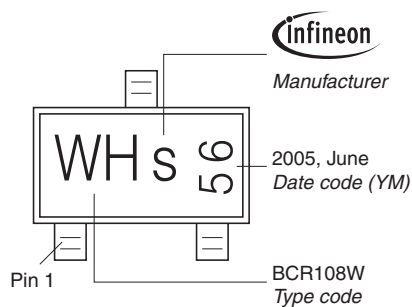
## Package Outline



## Foot Print

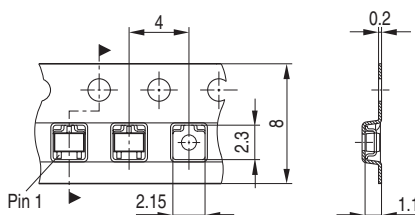


## Marking Layout (Example)

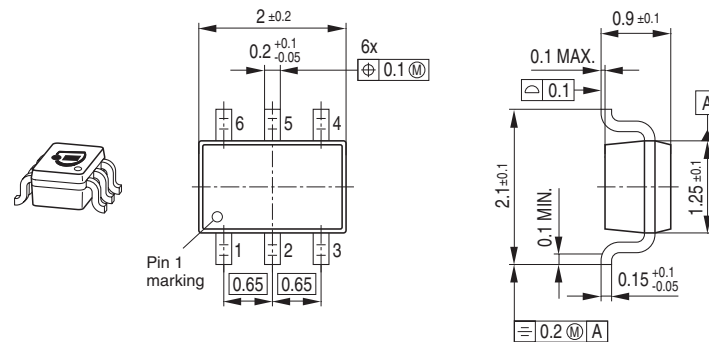


## Standard Packing

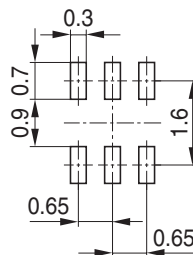
Reel  $\varnothing 180 \text{ mm}$  = 3.000 Pieces/Reel  
 Reel  $\varnothing 330 \text{ mm}$  = 10.000 Pieces/Reel



## Package Outline

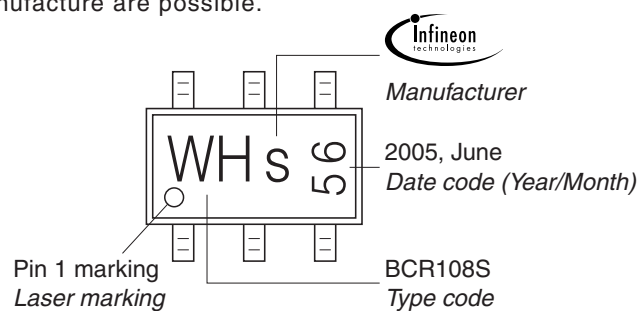


## Foot Print



## Marking Layout (Example)

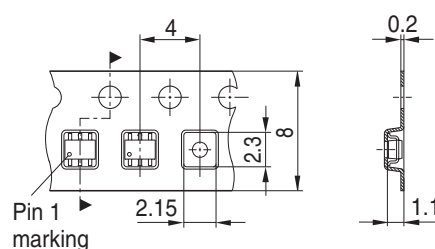
Small variations in positioning of  
Date code, Type code and Manufacture are possible.



## Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



The technical drawing shows two views of the M80-100 connector:

- Front View (Left):** Shows the top profile of the connector. Dimensions include a total width of  $1.2 \pm 0.05$ , a mounting hole diameter of  $\varnothing 0.2 \pm 0.05$ , a central pin labeled "3", and a rectangular body with a height of  $0.2 \pm 0.05$ . Below the body are three pins labeled 1, 2, and 3, with widths of  $0.2 \pm 0.05$ ,  $0.4 \pm 0.05$ , and  $0.4 \pm 0.05$  respectively.
- Side View (Right):** Shows the side profile of the connector. It features a vertical dimension of  $1.2 \pm 0.05$ , a horizontal distance from the mounting hole to the start of the main body of  $0.55 \pm 0.04$ , a body thickness of  $0.2 \pm 0.05$ , a base width of  $0.15 \pm 0.05$ , and a maximum taper angle of  $10^\circ \text{ MAX.}$  The overall depth of the component is  $0.8 \pm 0.05$ .

Technical drawing of a mechanical part. The drawing shows a top view and a side view. The top view is a rectangle with a width of 0.4 and a height of 0.45. The side view is a rectangle with a width of 0.4 and a height of 1.05. The drawing is labeled with dimensions: 0.4, 0.45, 1.05, and 0.4.

infineon  
Manufacturer

1F S

Pin 1

BCR847BF  
Type code

[illegible]

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**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331