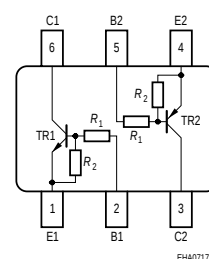
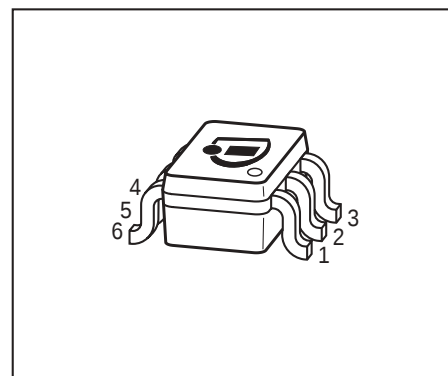
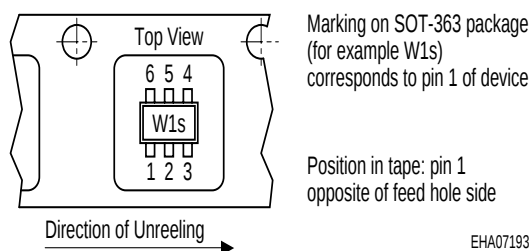


**NPN/PNP Silicon Digital Transistor Array**

- Switching circuit, inverter, interface circuit, driver circuit
- Two (galvanic) internal isolated NPN/PNP Transistors in one package
- Built in bias resistor NPN and PNP ( $R_1=22\text{ k}\Omega$ ,  $R_2=22\text{ k}\Omega$ )
- Pb-free (RoHS compliant) package <sup>1)</sup>
- Qualified according AEC Q101


**Tape loading orientation**


| Type    | Marking | Pin Configuration |      |      |      |      |      | Package |
|---------|---------|-------------------|------|------|------|------|------|---------|
| BCR22PN | WPs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363  |

**Maximum Ratings for NPN and PNP Types**

| Parameter                                                  | Symbol       | Value       | Unit             |
|------------------------------------------------------------|--------------|-------------|------------------|
| Collector-emitter voltage                                  | $V_{CEO}$    | 50          | V                |
| Collector-base voltage                                     | $V_{CBO}$    | 50          |                  |
| Input forward voltage                                      | $V_{i(fwd)}$ | 60          |                  |
| Input reverse voltage                                      | $V_{i(rev)}$ | 10          |                  |
| DC collector current                                       | $I_C$        | 100         | mA               |
| Total power dissipation, $T_S = 115\text{ }^\circ\text{C}$ | $P_{tot}$    | 250         | mW               |
| Junction temperature                                       | $T_j$        | 150         | $^\circ\text{C}$ |
| Storage temperature                                        | $T_{stg}$    | -65 ... 150 |                  |

**Thermal Resistance**

|                                          |            |            |     |
|------------------------------------------|------------|------------|-----|
| Junction - soldering point <sup>2)</sup> | $R_{thJS}$ | $\leq 140$ | K/W |
|------------------------------------------|------------|------------|-----|

<sup>1</sup>Pb-containing package may be available upon special request

<sup>2</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

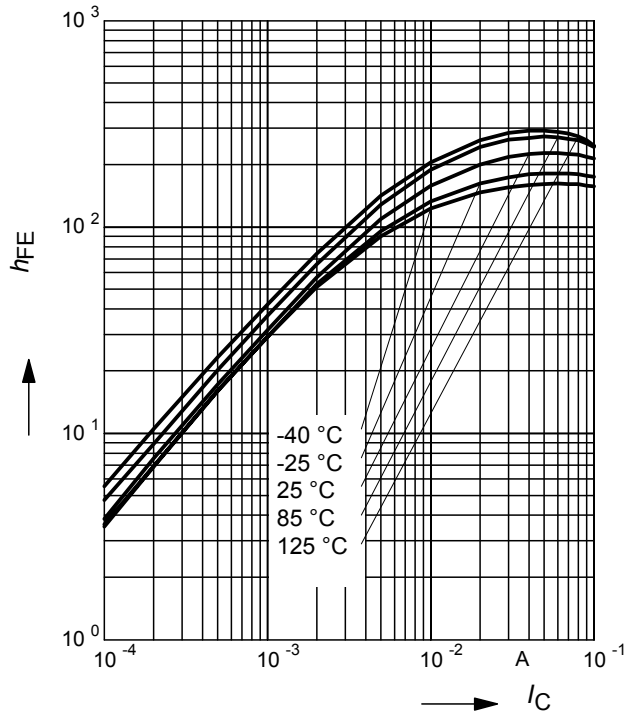
| Parameter                                                                                             | Symbol                      | Values |      |      | Unit          |
|-------------------------------------------------------------------------------------------------------|-----------------------------|--------|------|------|---------------|
|                                                                                                       |                             | min.   | typ. | max. |               |
| DC Characteristics for NPN and PNP Types                                                              |                             |        |      |      |               |
| 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 cutoff current<br>$V_{\text{CB}} = 40\ \text{V}$ , $I_E = 0$                                | $I_{\text{CBO}}$            | -      | -    | 100  | nA            |
| Emitter cutoff current<br>$V_{\text{EB}} = 10\ \text{V}$ , $I_C = 0$                                  | $I_{\text{EBO}}$            | -      | -    | 350  | $\mu\text{A}$ |
| DC current gain 1)<br>$I_C = 5\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$                            | $h_{\text{FE}}$             | 50     | -    | -    | -             |
| Collector-emitter saturation voltage1)<br>$I_C = 10\ \text{mA}$ , $I_B = 0.5\ \text{mA}$              | $V_{\text{CEsat}}$          | -      | -    | 0.3  | V             |
| Input off voltage<br>$I_C = 100\ \mu\text{A}$ , $V_{\text{CE}} = 5\ \text{V}$                         | $V_{\text{i(off)}}$         | 0.8    | -    | 1.5  |               |
| Input on Voltage<br>$I_C = 2\ \text{mA}$ , $V_{\text{CE}} = 0.3\ \text{V}$                            | $V_{\text{i(on)}}$          | 1      | -    | 2.5  |               |
| Input resistor                                                                                        | $R_1$                       | 15     | 22   | 29   | k $\Omega$    |
| Resistor ratio                                                                                        | $R_1/R_2$                   | 0.9    | 1    | 1.1  | -             |
| AC Characteristics for NPN and PNP Types                                                              |                             |        |      |      |               |
| Transition frequency<br>$I_C = 10\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$ , $f = 100\ \text{MHz}$ | $f_{\text{T}}$              | -      | 130  | -    | MHz           |
| Collector-base capacitance<br>$V_{\text{CB}} = 10\ \text{V}$ , $f = 1\ \text{MHz}$                    | $C_{\text{cb}}$             | -      | 3    | -    | pF            |

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

## NPN Type

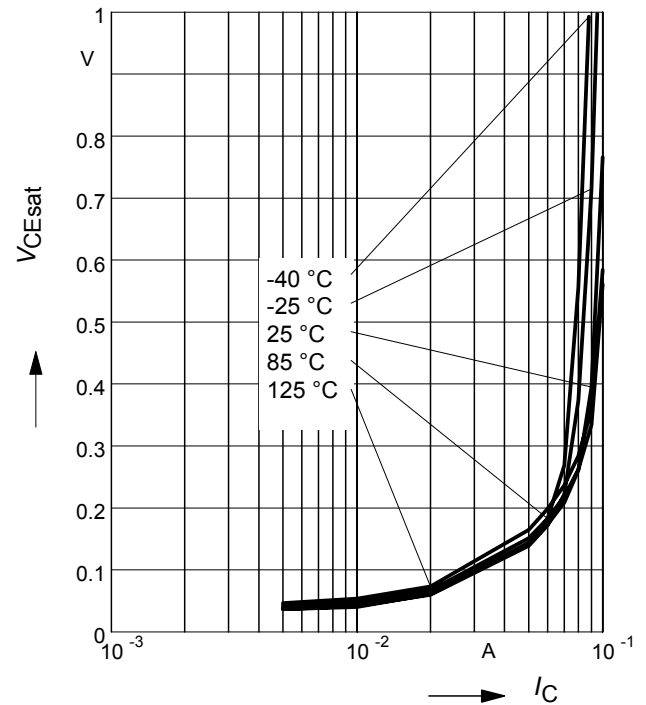
**DC Current Gain**  $h_{FE} = f(I_C)$

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



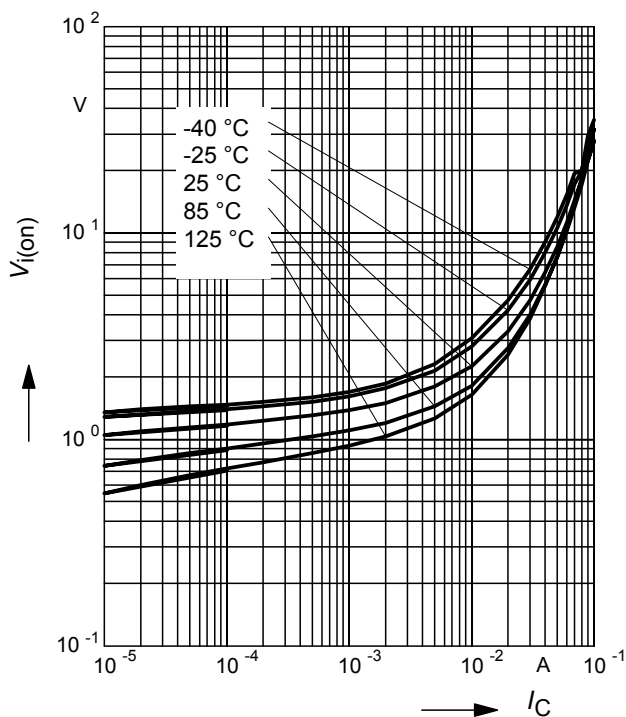
**Collector-Emitter Saturation Voltage**

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



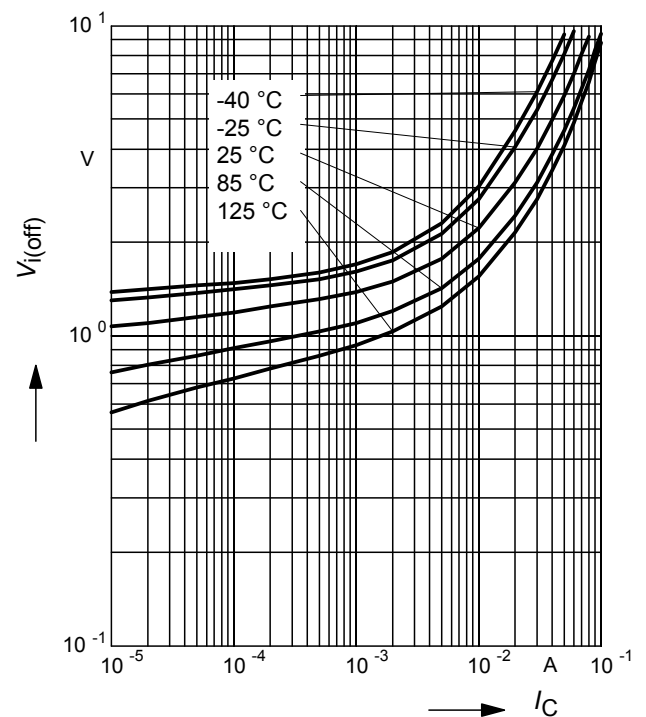
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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



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

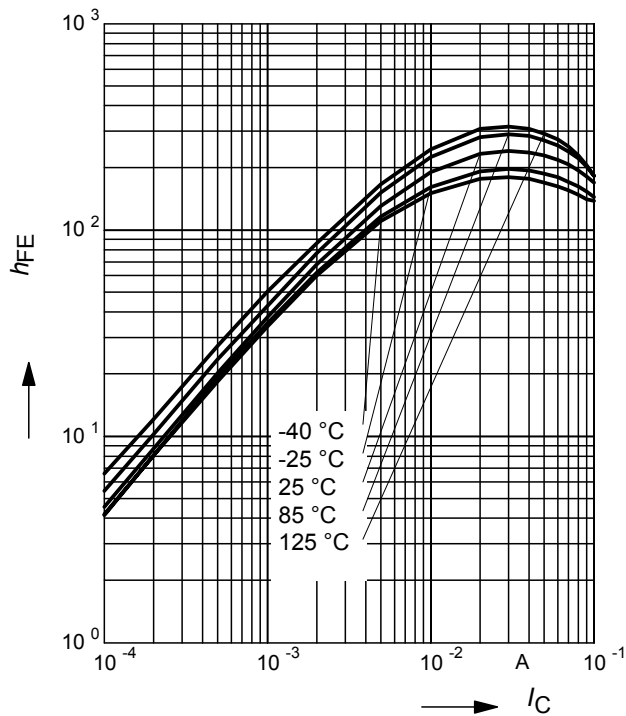
$V_{CE} = 5V$  (common emitter configuration)



## PNP Type

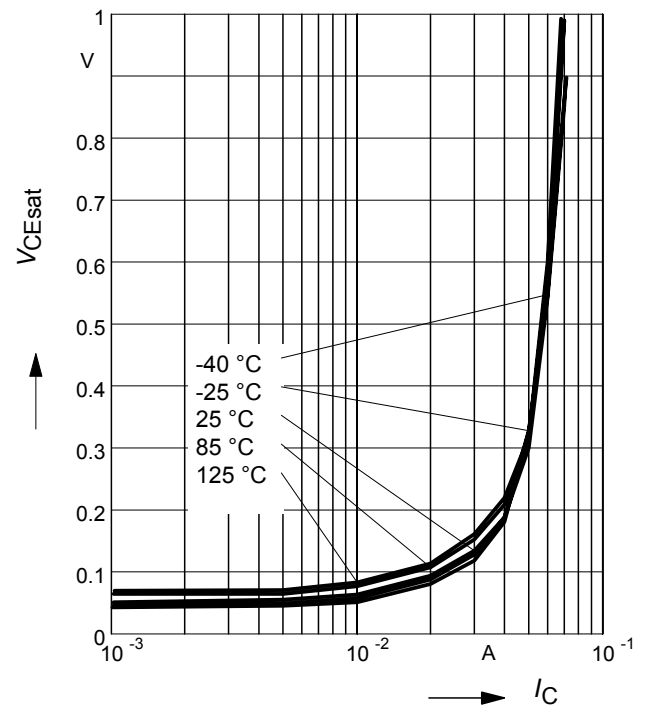
**DC Current Gain**  $h_{FE} = f(I_C)$

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



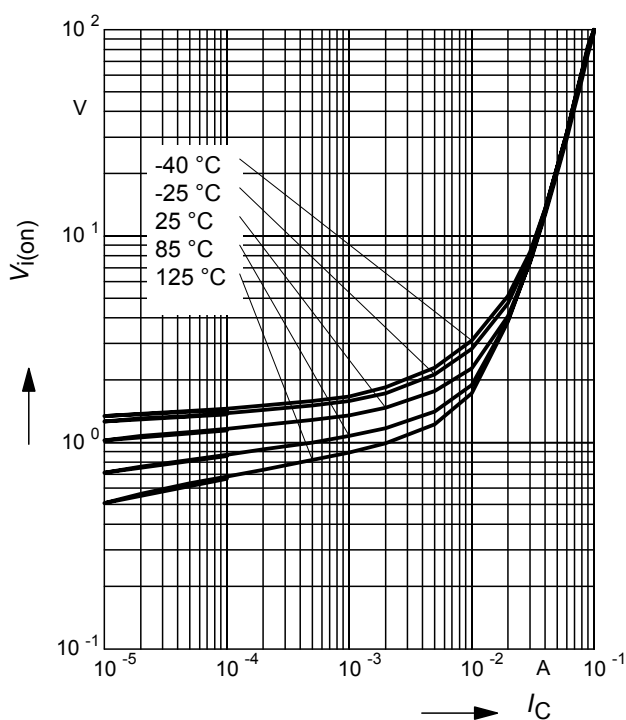
**Collector-Emitter Saturation Voltage**

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



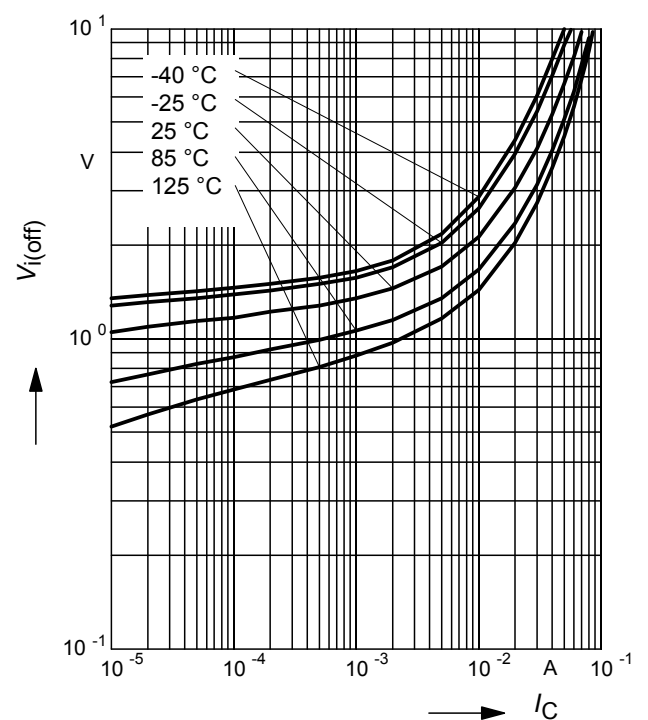
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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

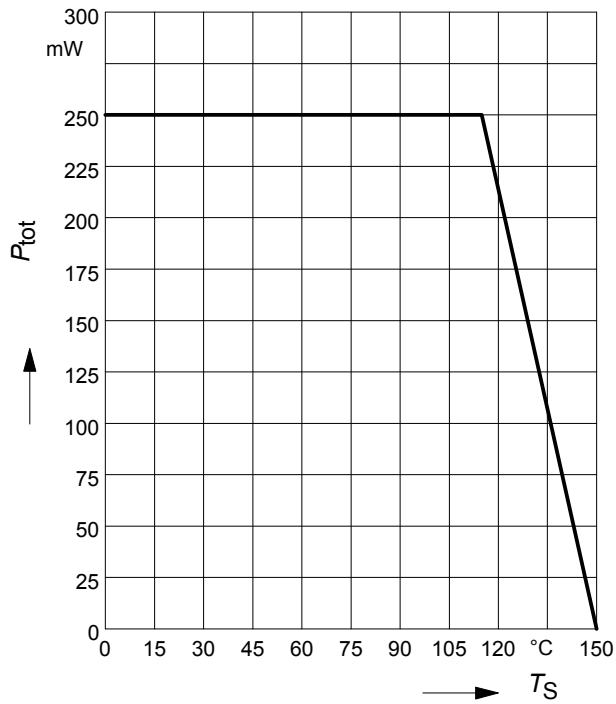


**Input off voltage**  $V_{i(off)} = f(I_C)$

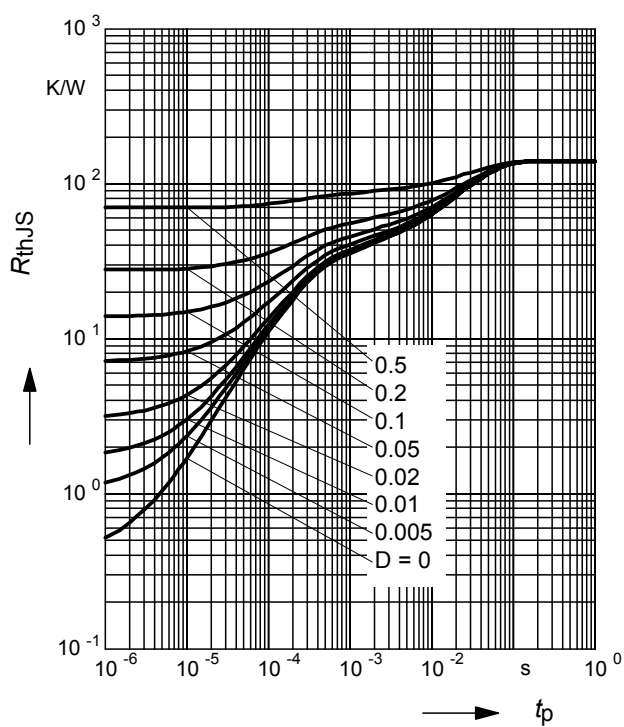
$V_{CE} = 5V$  (common emitter configuration)



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

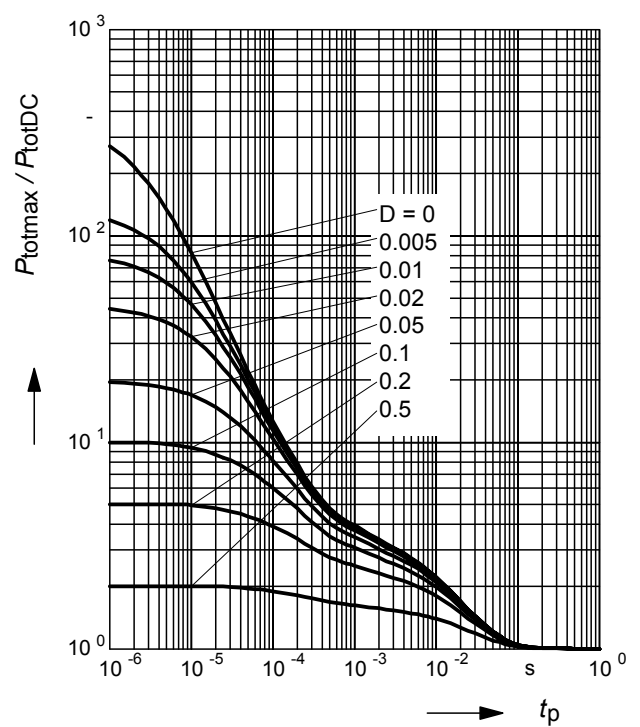


Permissible Pulse Load  $R_{\text{thJS}} = f(t_p)$

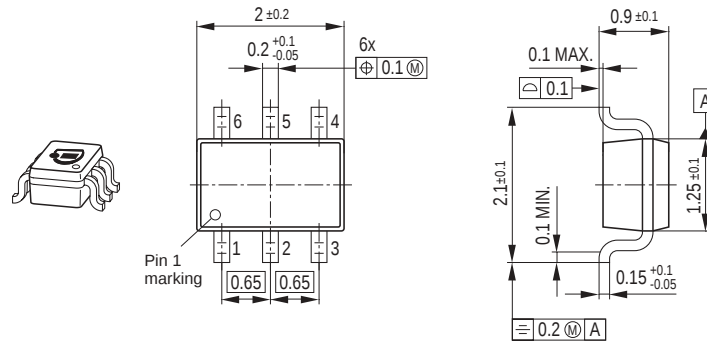


Permissible Pulse Load

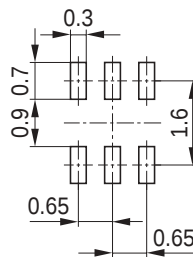
$P_{\text{totmax}} / P_{\text{totDC}} = f(t_p)$



## Package Outline

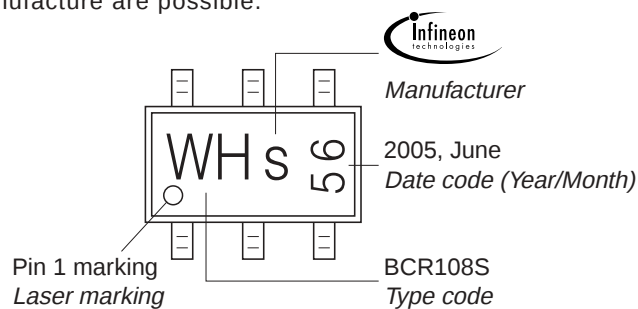


## Foot Print



## Marking Layout (Example)

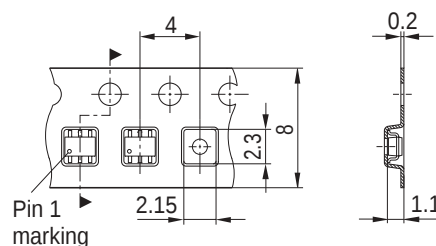
Small variations in positioning of Date code, Type code and Manufacture are possible.



## 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.



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