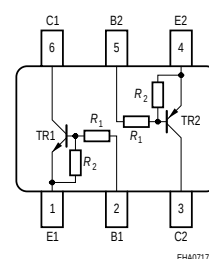
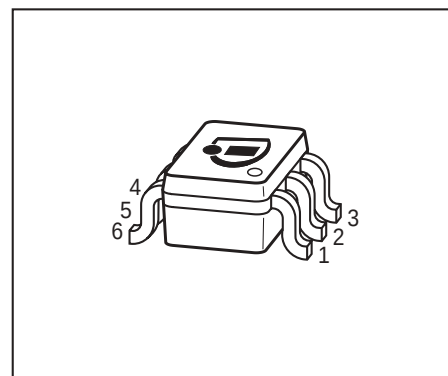
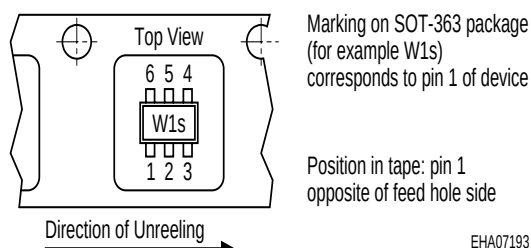


**NPN/PNP Silicon Digital Transistor Array**

- 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, $T_S = 115\text{ °C}$ | $P_{tot}$    | 250         | mW   |
| Junction temperature                           | $T_j$        | 150         | °C   |
| Storage temperature                            | $T_{stg}$    | -65 ... 150 |      |

**Thermal Resistance**

|                                          |            |       |     |
|------------------------------------------|------------|-------|-----|
| Junction - soldering point <sup>2)</sup> | $R_{thJS}$ | ≤ 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

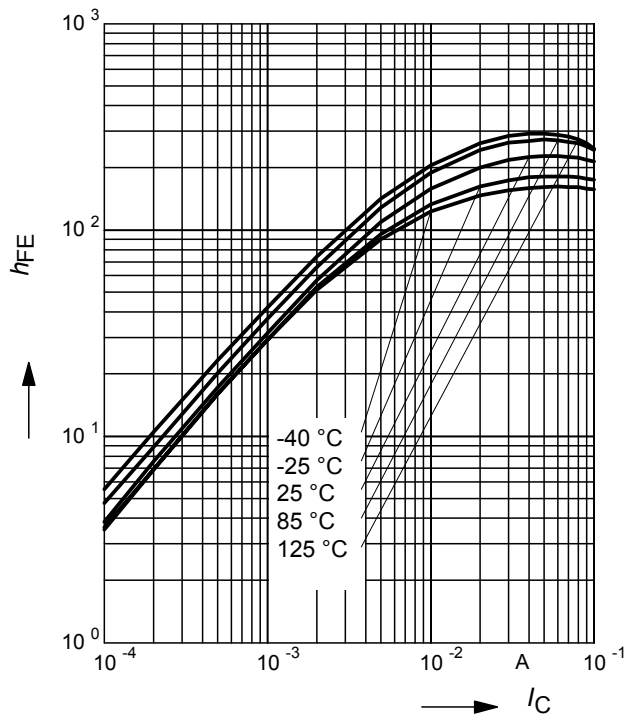
| Parameter                                                                                   | Symbol        | Values |      |      | Unit          |
|---------------------------------------------------------------------------------------------|---------------|--------|------|------|---------------|
|                                                                                             |               | min.   | typ. | max. |               |
| DC Characteristics for NPN and PNP Types                                                    |               |        |      |      |               |
| Collector-emitter breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$           | $V_{(BR)CEO}$ | 50     | -    | -    | V             |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$               | $V_{(BR)CBO}$ | 50     | -    | -    |               |
| Collector cutoff current<br>$V_{CB} = 40\text{ V}$ , $I_E = 0$                              | $I_{CBO}$     | -      | -    | 100  | nA            |
| Emitter cutoff current<br>$V_{EB} = 10\text{ V}$ , $I_C = 0$                                | $I_{EBO}$     | -      | -    | 350  | $\mu\text{A}$ |
| DC current gain 1)<br>$I_C = 5\text{ mA}$ , $V_{CE} = 5\text{ V}$                           | $h_{FE}$      | 50     | -    | -    | -             |
| Collector-emitter saturation voltage1)<br>$I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$      | $V_{CEsat}$   | -      | -    | 0.3  | V             |
| Input off voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $V_{CE} = 5\text{ V}$                 | $V_{i(off)}$  | 0.8    | -    | 1.5  |               |
| Input on Voltage<br>$I_C = 2\text{ mA}$ , $V_{CE} = 0.3\text{ V}$                           | $V_{i(on)}$   | 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>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$ | $f_T$         | -      | 130  | -    | MHz           |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                   | $C_{cb}$      | -      | 3    | -    | pF            |

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

## NPN Type

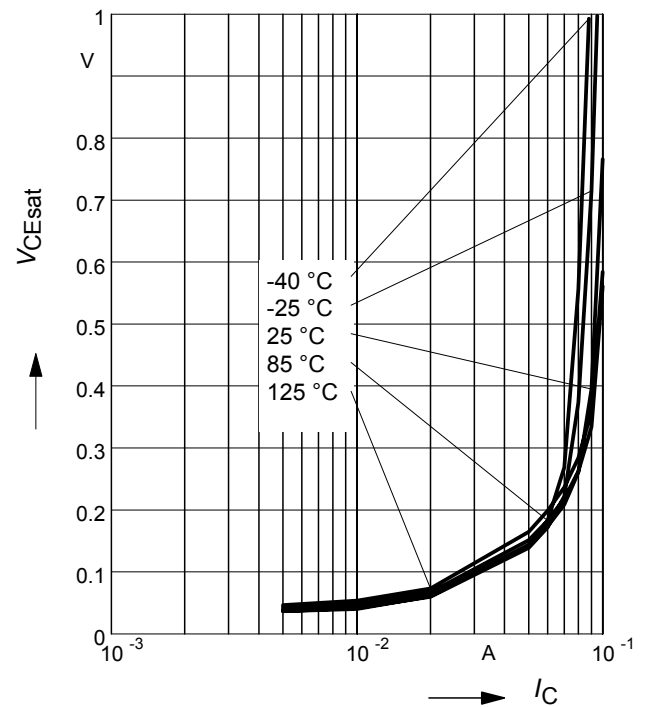
**DC Current Gain**  $h_{FE} = f(I_C)$

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



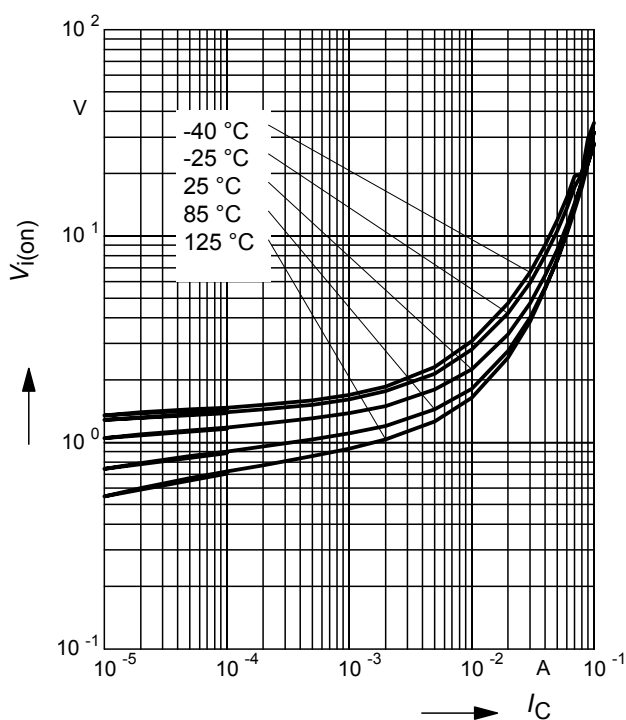
**Collector-Emitter Saturation Voltage**

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



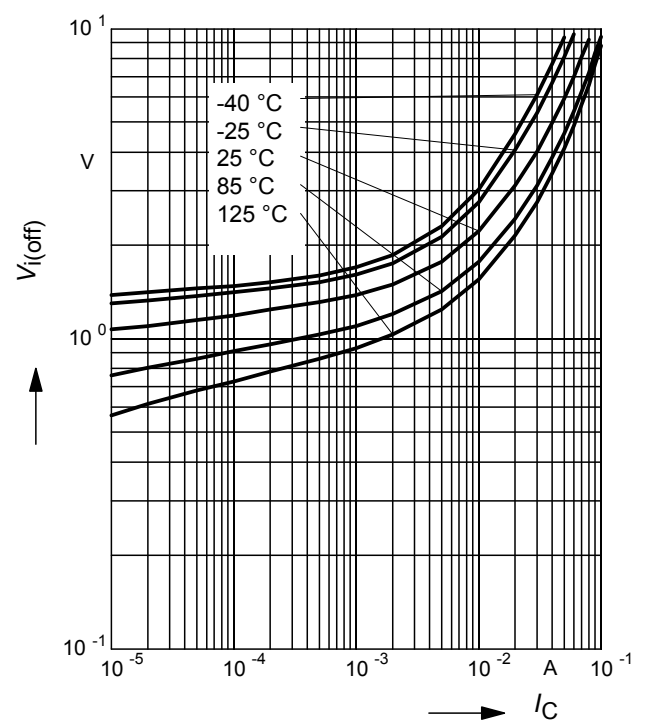
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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



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

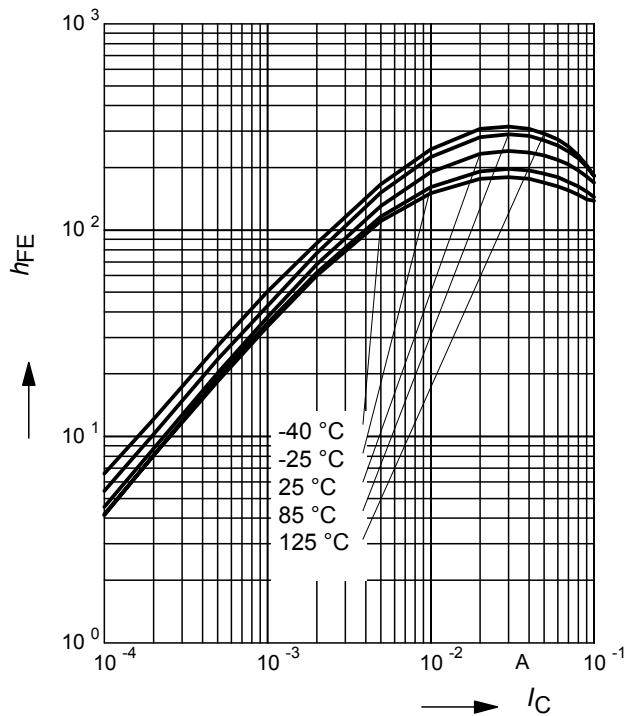
$V_{CE} = 5V$  (common emitter configuration)



## PNP Type

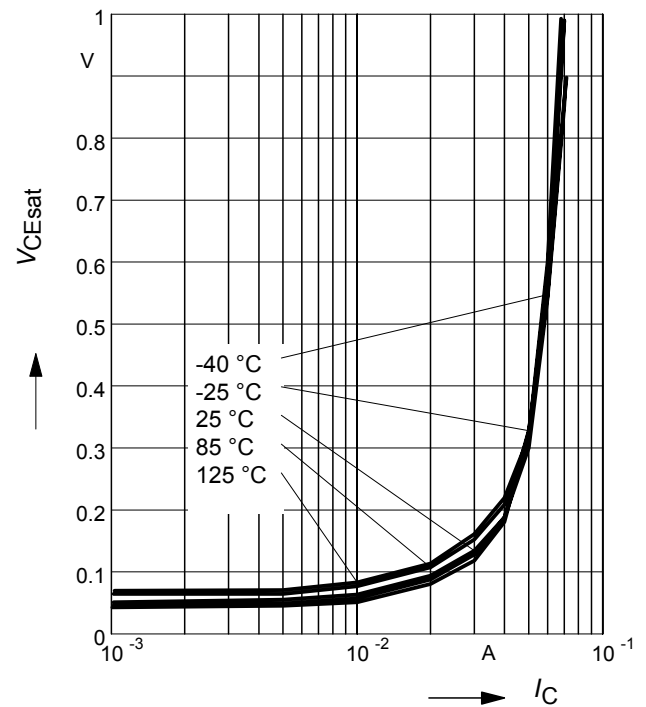
**DC Current Gain**  $h_{FE} = f(I_C)$

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



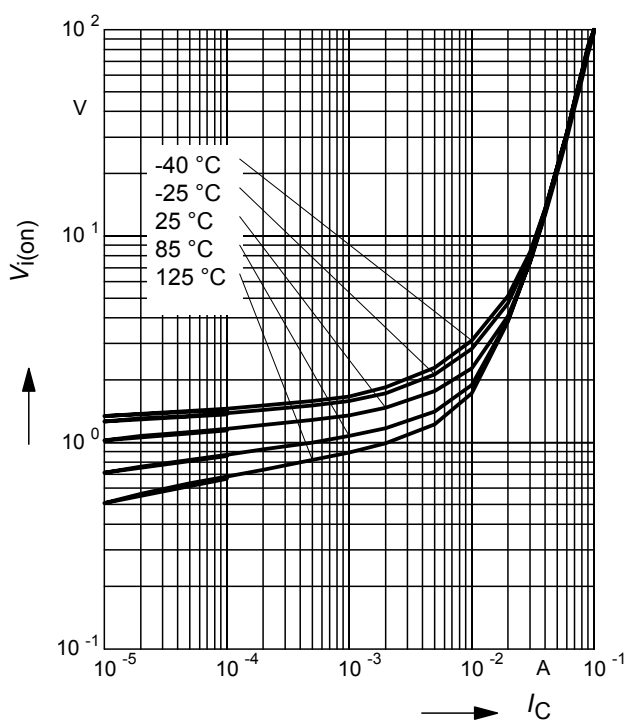
**Collector-Emitter Saturation Voltage**

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



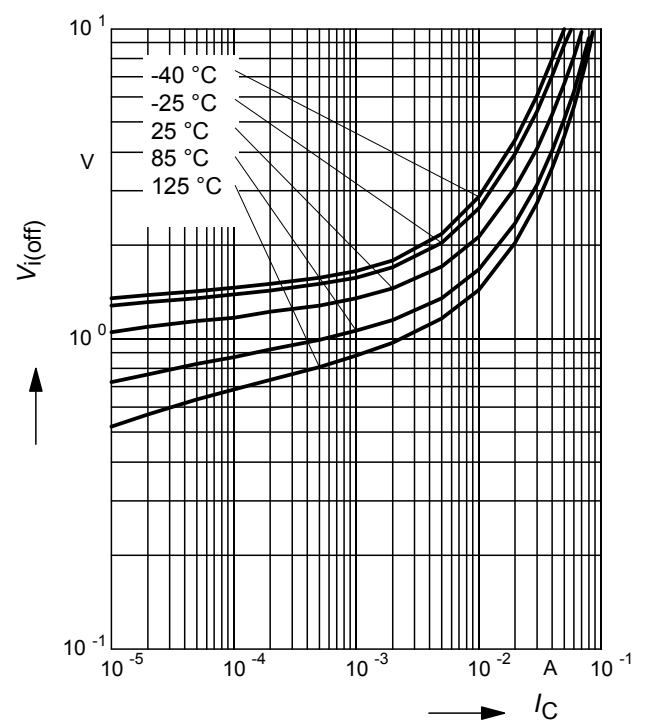
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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

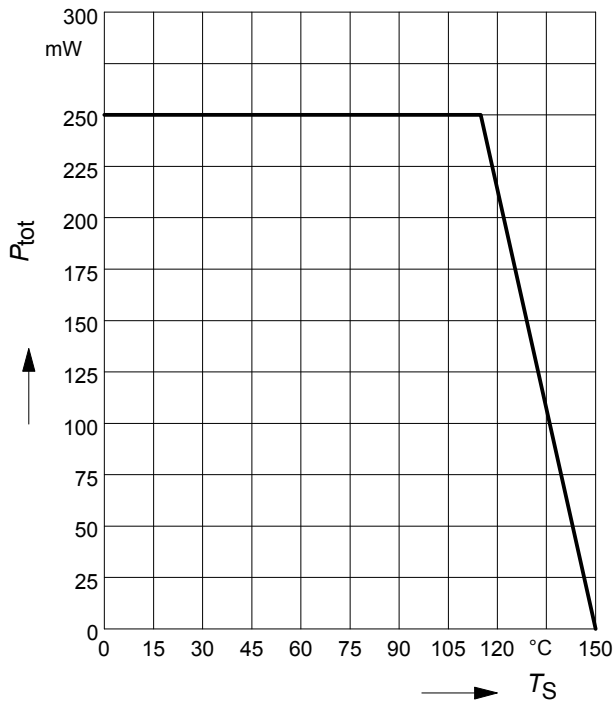


**Input off voltage**  $V_{i(off)} = f(I_C)$

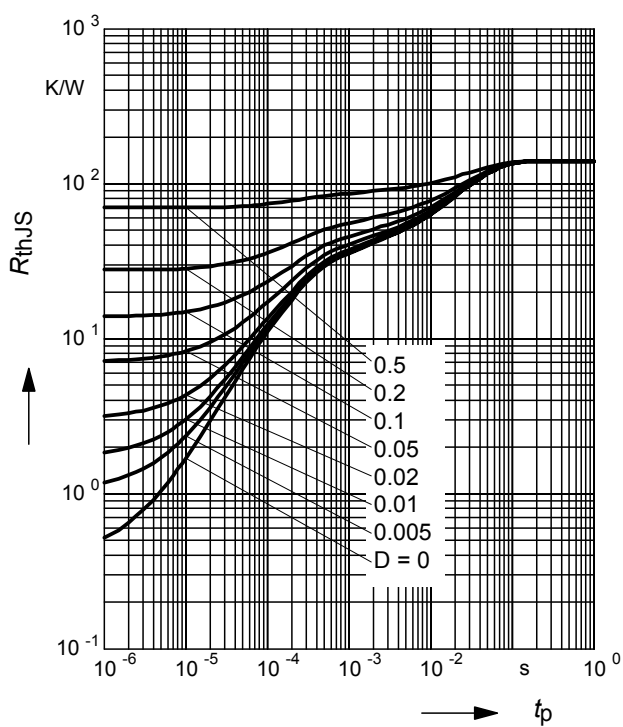
$V_{CE} = 5V$  (common emitter configuration)



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

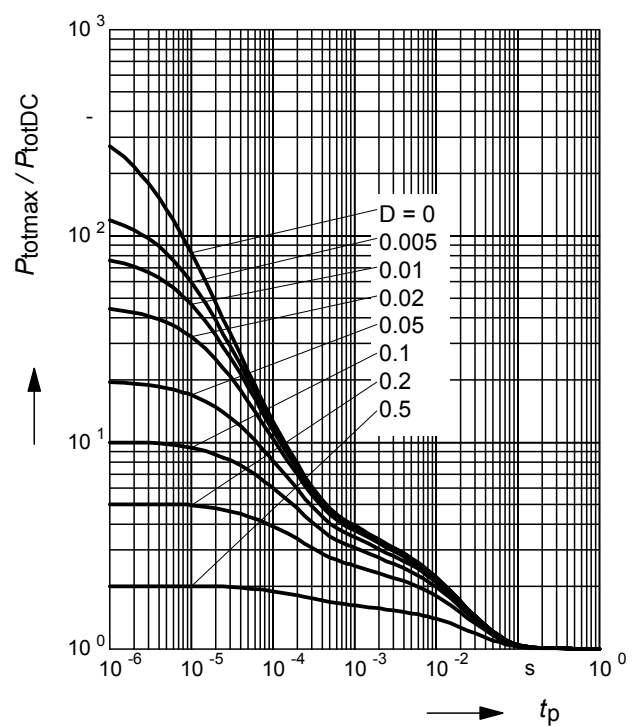


Permissible Pulse Load  $R_{\text{thJS}} = f(t_p)$

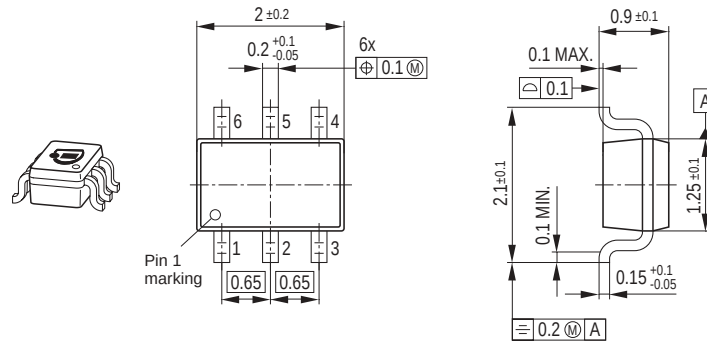


Permissible Pulse Load

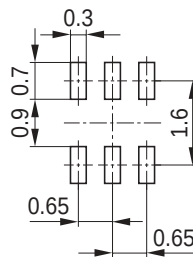
$P_{\text{totmax}} / P_{\text{totDC}} = f(t_p)$



## Package Outline

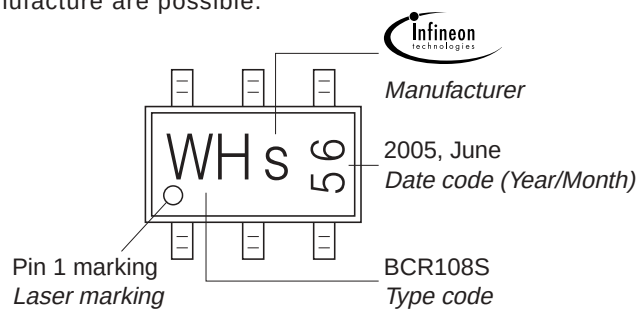


## Foot Print



## Marking Layout (Example)

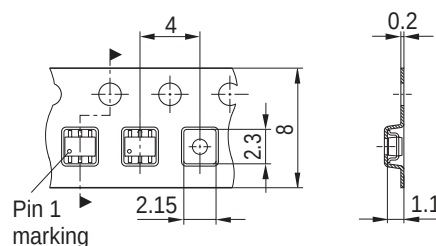
Small variations in positioning of Date code, Type code and Manufacture are possible.



## Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



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