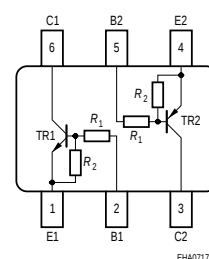
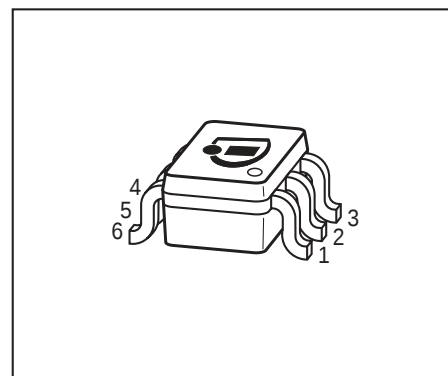


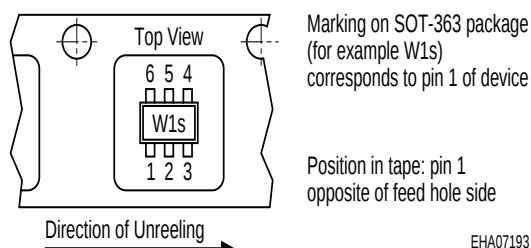
## NPN/PNP Silicon Digital Transistor Array

- Switching circuit, inverter, interface circuit, driver circuit
- Two (galvanic) internal isolated NPN/PNP Transistors in one package
- Built in bias resistor NPN and PNP ( $R_1=2.2\text{ k}\Omega$ ,  $R_2=47\text{ k}\Omega$ )
- Pb-free (RoHS compliant) package <sup>1)</sup>
- Qualified according AEC Q101



EHA07176

### Tape loading orientation



| Type    | Marking | Pin Configuration |      |      |      |      |      | Package |
|---------|---------|-------------------|------|------|------|------|------|---------|
| BCR08PN | WFs     | 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                          | $V_{i(fwd)}$ | 20          |      |
| Input reverse voltage                          | $V_{i(rev)}$ | 5           |      |
| 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

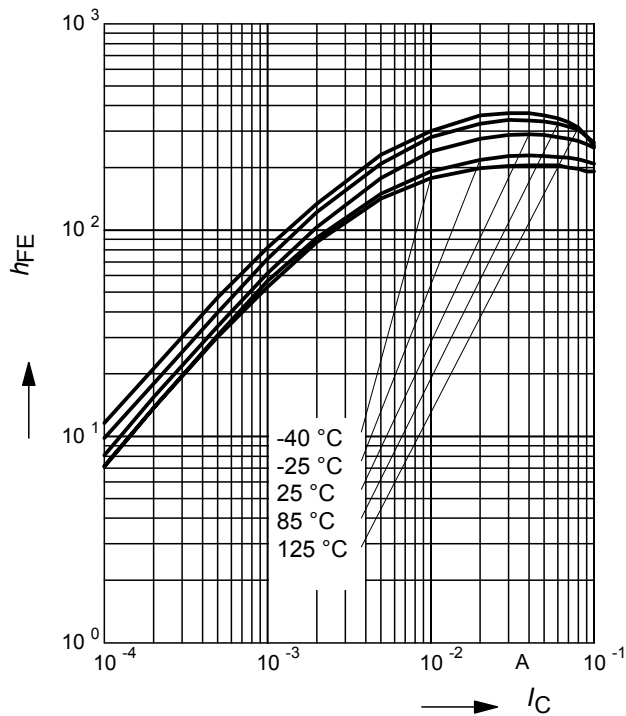
| Parameter                                                                                          | Symbol                      | Values |       |       | Unit          |
|----------------------------------------------------------------------------------------------------|-----------------------------|--------|-------|-------|---------------|
|                                                                                                    |                             | min.   | typ.  | max.  |               |
| DC Characteristics for NPN and PNP Types                                                           |                             |        |       |       |               |
| Collector-emitter breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$                  | $V_{(\text{BR})\text{CEO}}$ | 50     | -     | -     | V             |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$                      | $V_{(\text{BR})\text{CBO}}$ | 50     | -     | -     |               |
| Collector cutoff current<br>$V_{\text{CB}} = 40\text{ V}$ , $I_E = 0$                              | $I_{\text{CBO}}$            | -      | -     | 100   | nA            |
| Emitter cutoff current<br>$V_{\text{EB}} = 5\text{ V}$ , $I_C = 0$                                 | $I_{\text{EBO}}$            | -      | -     | 164   | $\mu\text{A}$ |
| DC current gain 1)<br>$I_C = 5\text{ mA}$ , $V_{\text{CE}} = 5\text{ V}$                           | $h_{\text{FE}}$             | 70     | -     | -     | -             |
| 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>$I_C = 100\text{ }\mu\text{A}$ , $V_{\text{CE}} = 5\text{ V}$                 | $V_{\text{i(off)}}$         | 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                                                                                     | $R_1$                       | 1.5    | 2.2   | 2.9   | k $\Omega$    |
| Resistor ratio                                                                                     | $R_1/R_2$                   | 0.042  | 0.047 | 0.052 | -             |
| AC Characteristics for NPN and PNP Types                                                           |                             |        |       |       |               |
| Transition frequency<br>$I_C = 10\text{ mA}$ , $V_{\text{CE}} = 5\text{ V}$ , $f = 100\text{ MHz}$ | $f_{\text{T}}$              | -      | 170   | -     | MHz           |
| Collector-base capacitance<br>$V_{\text{CB}} = 10\text{ V}$ , $f = 1\text{ MHz}$                   | $C_{\text{cb}}$             | -      | 2     | -     | pF            |

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

## NPN Type

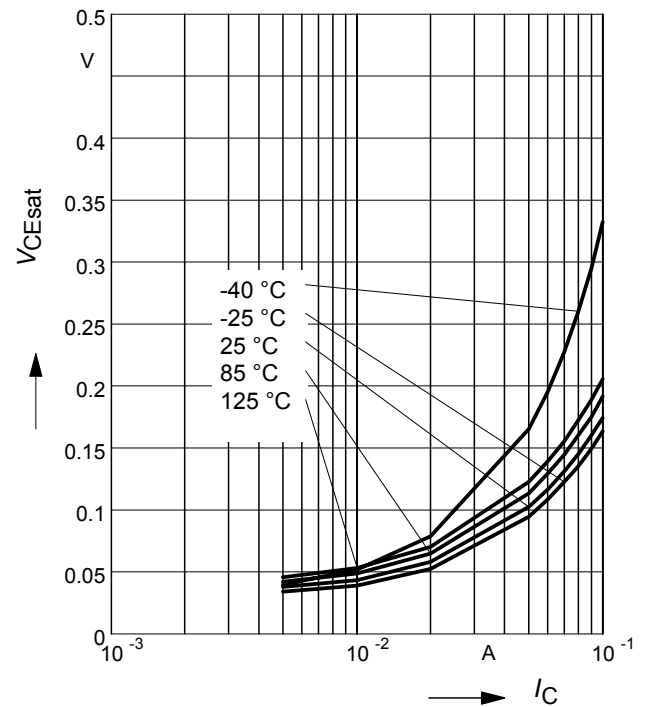
**DC Current Gain**  $h_{FE} = f(I_C)$

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



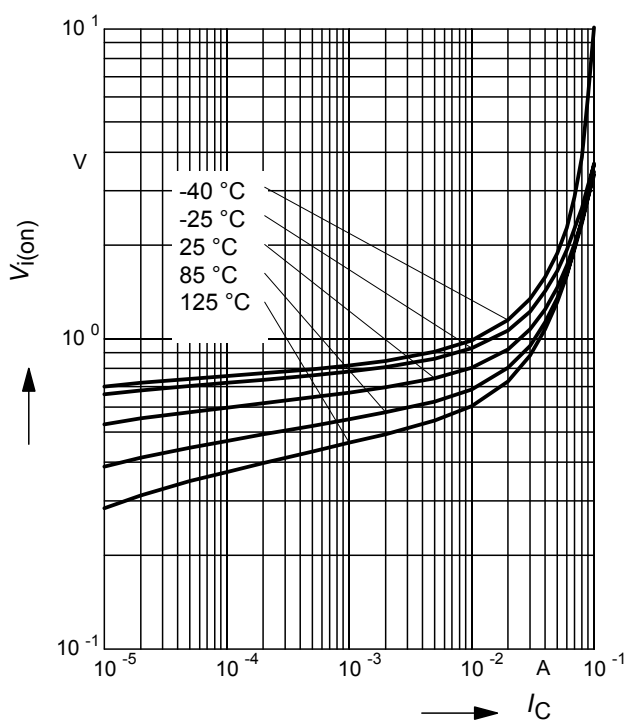
**Collector-Emitter Saturation Voltage**

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



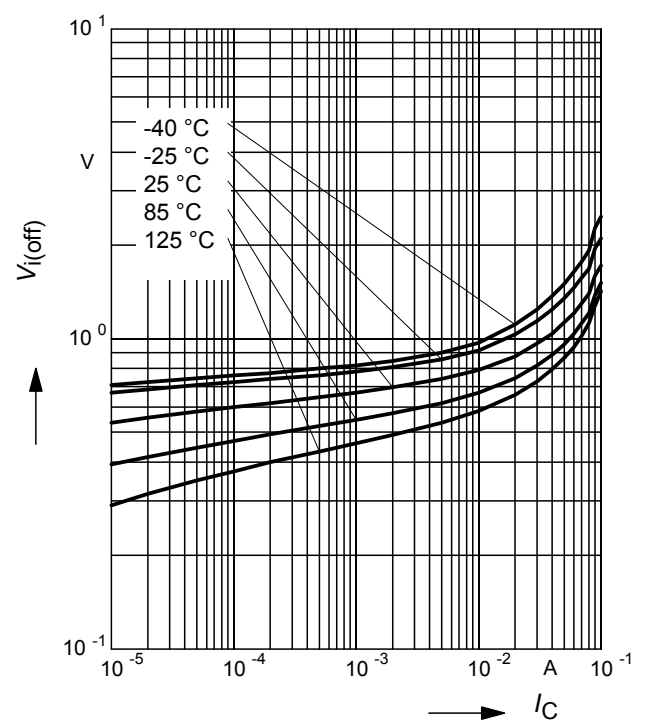
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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



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

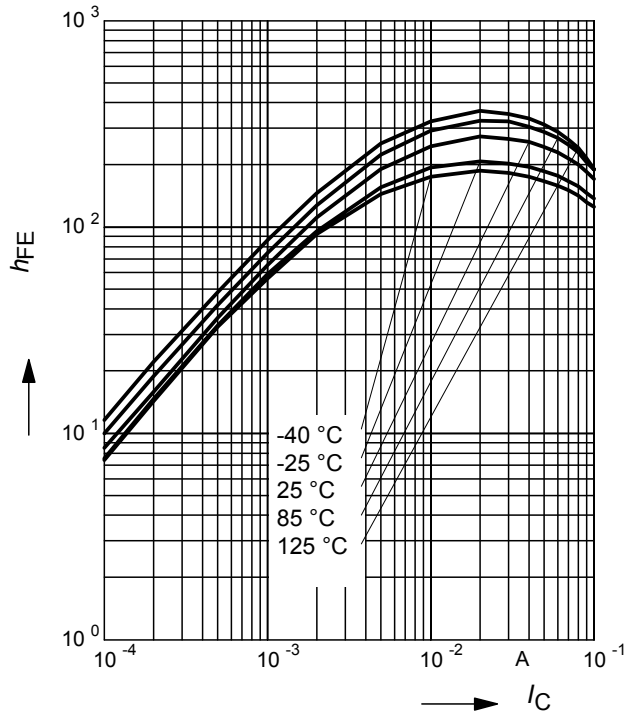
$V_{CE} = 5V$  (common emitter configuration)



## PNP Type

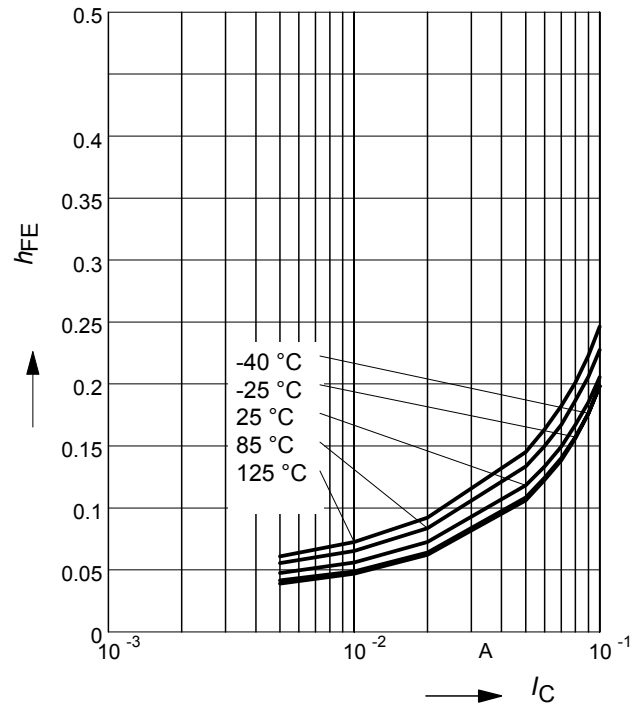
**DC Current Gain**  $h_{FE} = f(I_C)$

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



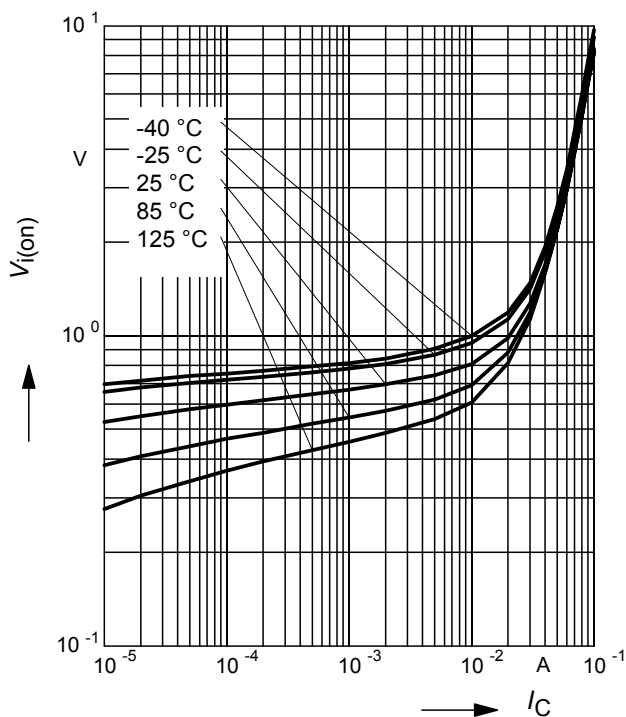
**Collector-Emitter Saturation Voltage**

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



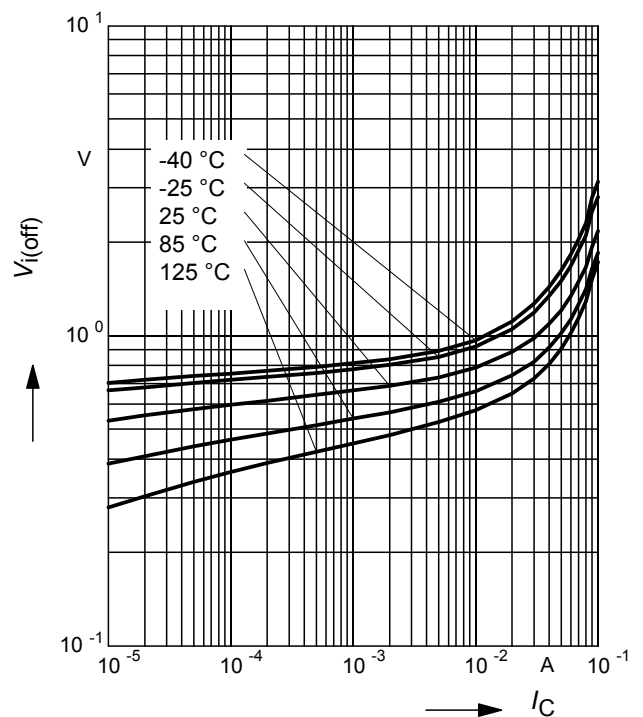
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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

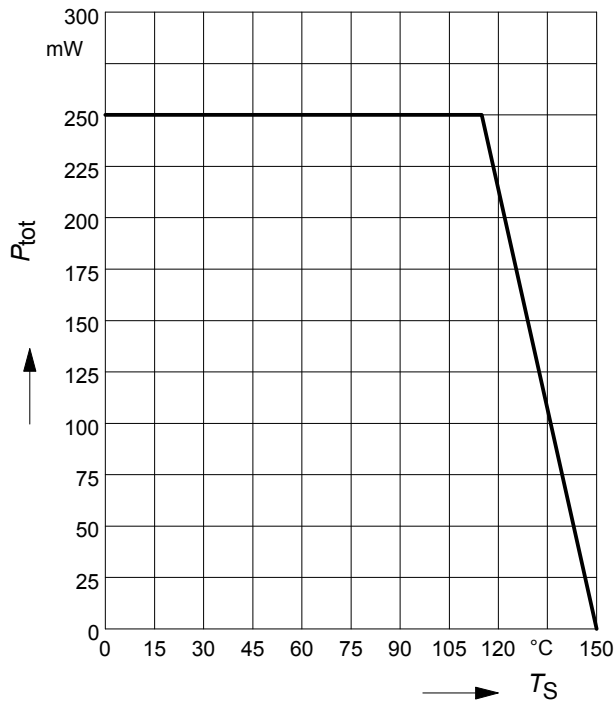


**Input off voltage**  $V_{i(off)} = f(I_C)$

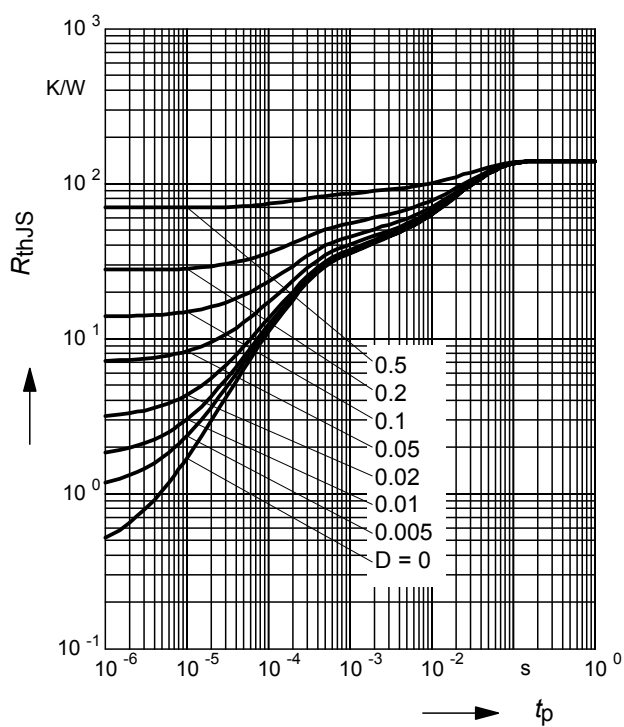
$V_{CE} = 5V$  (common emitter configuration)



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

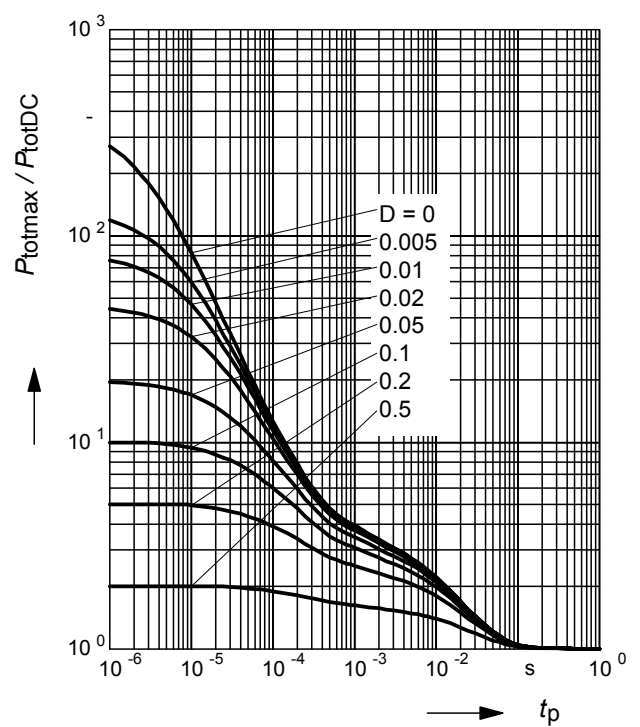


Permissible Pulse Load  $R_{\text{thJS}} = f(t_p)$

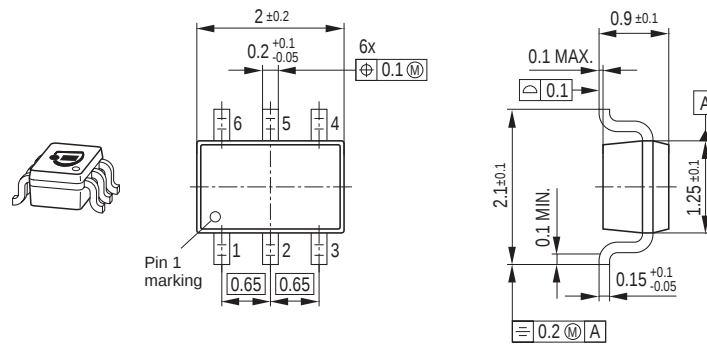


Permissible Pulse Load

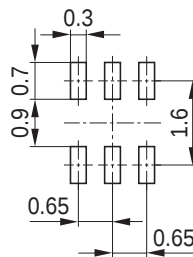
$P_{\text{totmax}} / P_{\text{totDC}} = f(t_p)$



## Package Outline

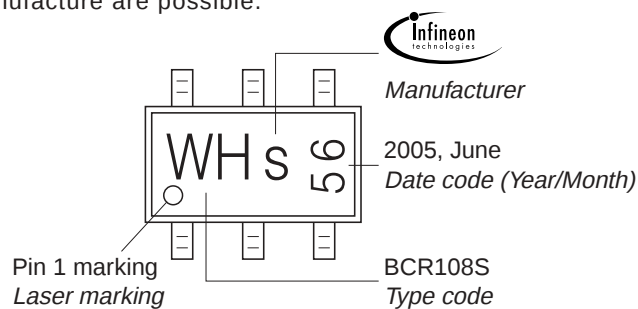


## Foot Print



## Marking Layout (Example)

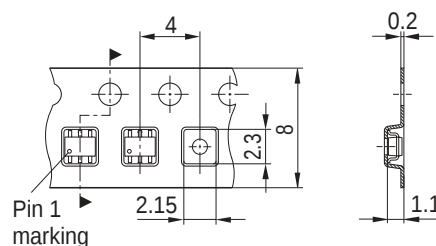
Small variations in positioning of Date code, Type code and Manufacture are possible.



## Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



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