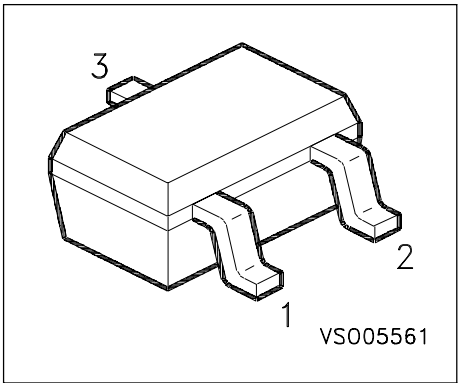
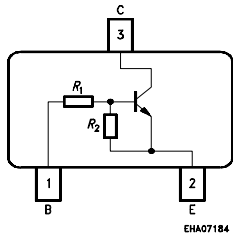


NPN Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1=22k\Omega$ ,  $R_2=22k\Omega$ )



| Type     | Marking | Ordering Code | Pin Configuration |       |       | Package |
|----------|---------|---------------|-------------------|-------|-------|---------|
| BCR 141W | WDs     | Q62702-C2288  | 1 = B             | 2 = E | 3 = C | SOT-323 |

Maximum Ratings

| Parameter                                            | Symbol      | Values         | Unit               |
|------------------------------------------------------|-------------|----------------|--------------------|
| Collector-emitter voltage                            | $V_{CEO}$   | 50             | V                  |
| Collector-base voltage                               | $V_{CBO}$   | 50             |                    |
| Emitter-base voltage                                 | $V_{EBO}$   | 10             |                    |
| Input on Voltage                                     | $V_{i(on)}$ | 30             |                    |
| DC collector current                                 | $I_C$       | 100            | mA                 |
| Total power dissipation, $T_S = 124^{\circ}\text{C}$ | $P_{tot}$   | 250            | mW                 |
| Junction temperature                                 | $T_j$       | 150            | $^{\circ}\text{C}$ |
| Storage temperature                                  | $T_{stg}$   | - 65 ... + 150 |                    |

Thermal Resistance

|                                |            |            |     |
|--------------------------------|------------|------------|-----|
| Junction ambient <sup>1)</sup> | $R_{thJA}$ | $\leq 240$ | K/W |
| Junction - soldering point     | $R_{thJS}$ | $\leq 105$ |     |

1) Package mounted on pcb 40mm x 40mm x 1.5mm / 0.5cm<sup>2</sup> Cu

### 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>$I_C = 100\ \mu\text{A}$ , $I_B = 0$               | $V_{(BR)CEO}$ | 50  | -  | -   | V             |
| Collector-base breakdown voltage<br>$I_C = 10\ \mu\text{A}$ , $I_B = 0$                   | $V_{(BR)CBO}$ | 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<br>$I_C = 5\ \text{mA}$ , $V_{CE} = 5\ \text{V}$                          | $h_{FE}$      | 50  | -  | -   | -             |
| Collector-emitter saturation voltage 1)<br>$I_C = 10\ \text{mA}$ , $I_B = 0.5\ \text{mA}$ | $V_{CEsat}$   | -   | -  | 0.3 | V             |
| Input off voltage<br>$I_C = 100\ \mu\text{A}$ , $V_{CE} = 5\ \text{V}$                    | $V_{i(off)}$  | 0.8 | -  | 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 | -             |

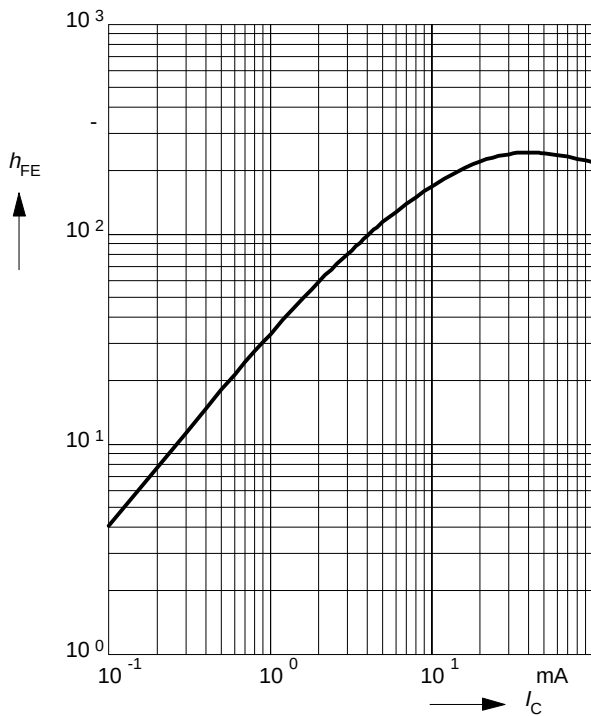
### AC Characteristics

|                                                                                                |          |   |     |   |     |
|------------------------------------------------------------------------------------------------|----------|---|-----|---|-----|
| 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:  $t < 300\ \mu\text{s}$ ;  $D < 2\%$

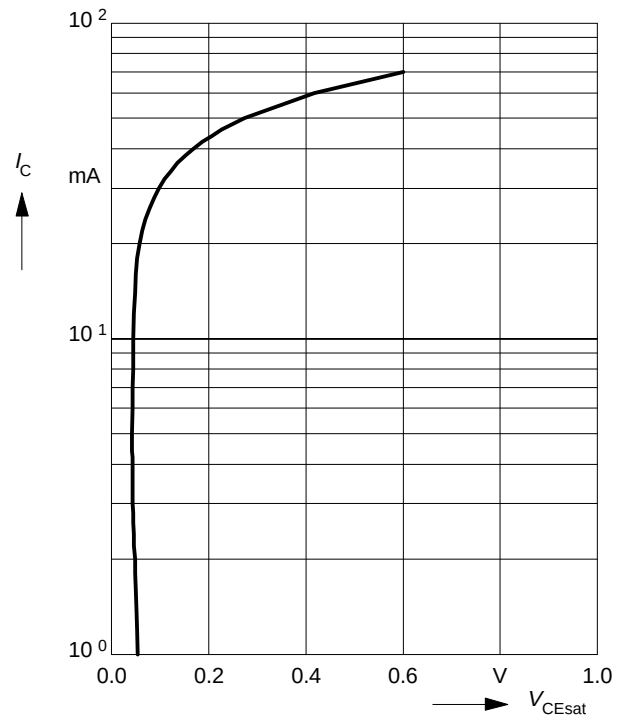
## DC Current Gain $h_{FE} = f(I_C)$

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



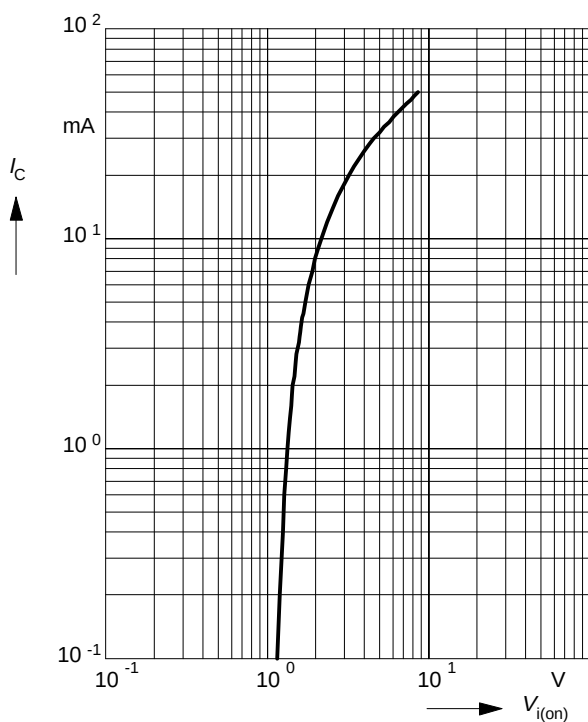
## Collector-Emitter Saturation Voltage

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



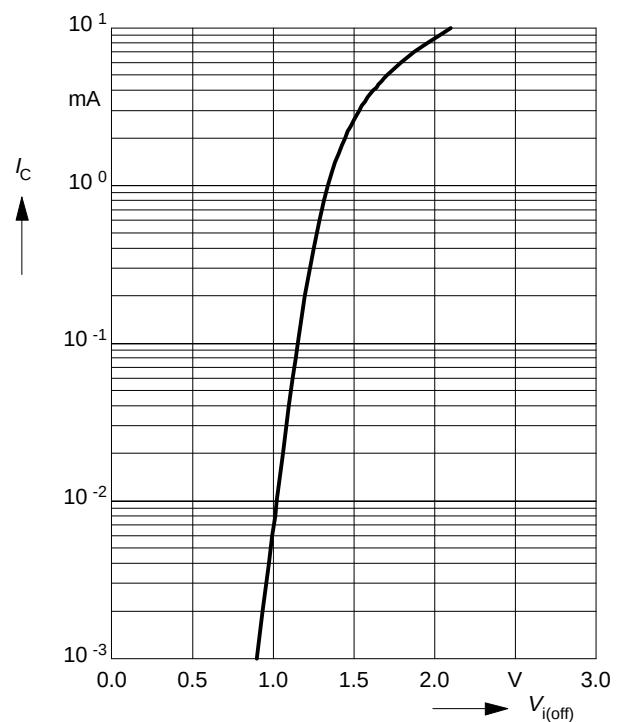
## Input on Voltage $V_{i(on)} = f(I_C)$

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

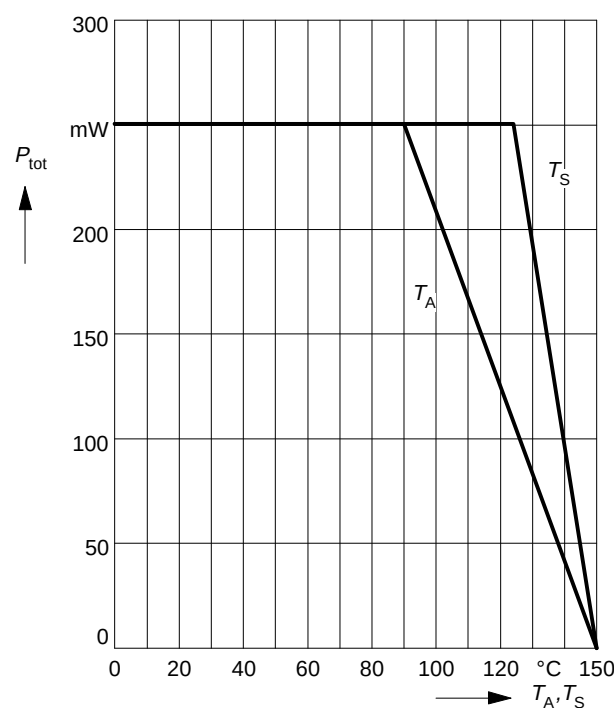


## Input off voltage $V_{i(off)} = f(I_C)$

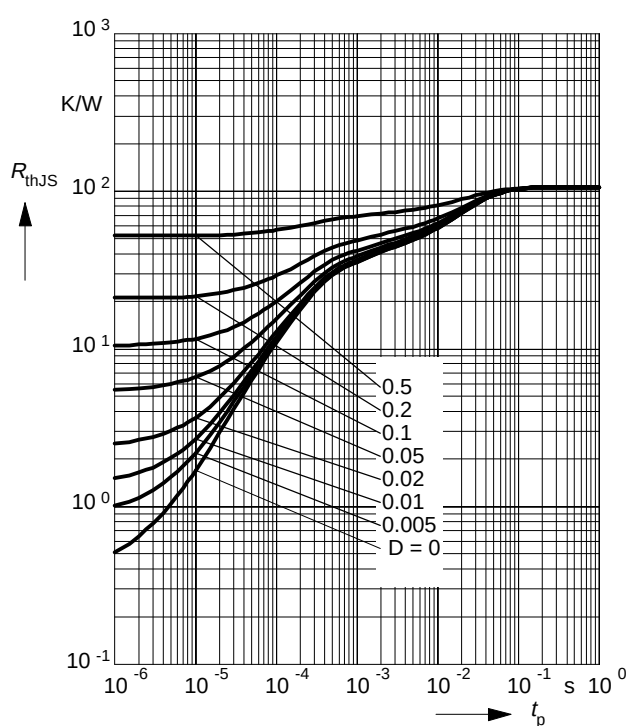
$V_{CE} = 5V$  (common emitter configuration)



**Total power dissipation**  $P_{\text{tot}} = f(T_A^*; T_S)$   
\* Package mounted on epoxy



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



**Permissible Pulse Load**  $P_{\text{totmax}} / P_{\text{totDC}} = f(t_p)$

