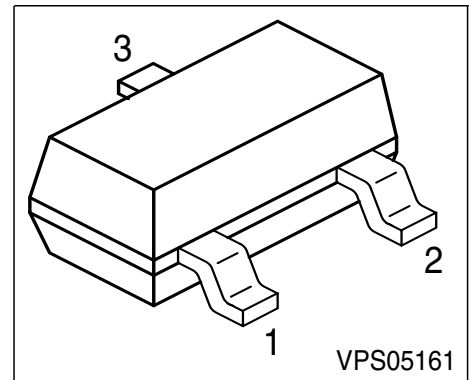
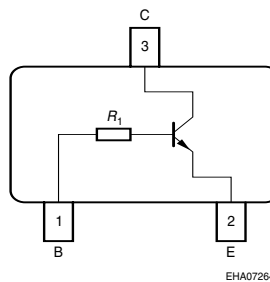


**NPN Silicon Digital Transistor**

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1 = 4.7\text{k}\Omega$ )



| Type    | Marking | Pin Configuration |       |       | Package |
|---------|---------|-------------------|-------|-------|---------|
| BCR 519 | XKs     | 1 = B             | 2 = E | 3 = C | SOT-23  |

**Maximum Ratings**

| Parameter                                                 | Symbol      | Value       | Unit             |
|-----------------------------------------------------------|-------------|-------------|------------------|
| Collector-emitter voltage                                 | $V_{CEO}$   | 50          | V                |
| Collector-base voltage                                    | $V_{CBO}$   | 50          |                  |
| Emitter-base voltage                                      | $V_{EBO}$   | 5           |                  |
| Input on Voltage                                          | $V_{i(on)}$ | 30          |                  |
| DC collector current                                      | $I_C$       | 500         | mA               |
| Total power dissipation, $T_S = 79\text{ }^\circ\text{C}$ | $P_{tot}$   | 330         | mW               |
| Junction temperature                                      | $T_j$       | 150         | $^\circ\text{C}$ |
| Storage temperature                                       | $T_{stg}$   | -65 ... 150 |                  |

**Thermal Resistance**

|                                |            |            |     |
|--------------------------------|------------|------------|-----|
| Junction ambient <sup>1)</sup> | $R_{thJA}$ | $\leq 325$ | K/W |
| Junction - soldering point     | $R_{thJS}$ | $\leq 215$ |     |

1) Package mounted on pcb 40mm x 40mm x 1.5mm / 6cm <sup>2</sup>Cu

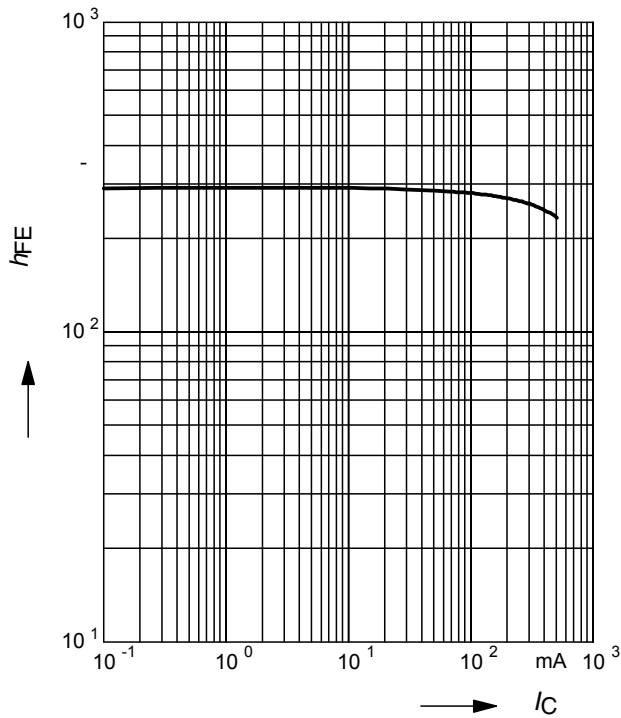
**Electrical Characteristics** at  $T_A=25^{\circ}\text{C}$ , unless otherwise specified

| Parameter                                                                                   | Symbol        | Values |      |      | Unit |
|---------------------------------------------------------------------------------------------|---------------|--------|------|------|------|
|                                                                                             |               | min.   | typ. | max. |      |
| DC Characteristics                                                                          |               |        |      |      |      |
| Collector-emitter breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$           | $V_{(BR)CEO}$ | 50     | -    | -    | V    |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $I_B = 0$               | $V_{(BR)CBO}$ | 50     | -    | -    |      |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$                 | $V_{(BR)EBO}$ | 5      | -    | -    | V    |
| Collector cutoff current<br>$V_{CB} = 40\text{ V}$ , $I_E = 0$                              | $I_{CBO}$     | -      | -    | 100  | nA   |
| DC current gain 1)<br>$I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ V}$                          | $h_{FE}$      | 120    | -    | 630  | -    |
| Collector-emitter saturation voltage1)<br>$I_C = 50\text{ mA}$ , $I_B = 2.5\text{ mA}$      | $V_{CEsat}$   | -      | -    | 0.3  | V    |
| Input off voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $V_{CE} = 5\text{ V}$                 | $V_{i(off)}$  | 0.4    | -    | 0.8  | V    |
| Input on Voltage<br>$I_C = 10\text{ mA}$ , $V_{CE} = 0.3\text{ V}$                          | $V_{i(on)}$   | 0.5    | -    | 1.5  | V    |
| Input resistor                                                                              | $R_1$         | 3.2    | 4.7  | 6.2  | kΩ   |
| AC Characteristics                                                                          |               |        |      |      |      |
| Transition frequency<br>$I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$ | $f_T$         | -      | 100  | -    | MHz  |

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

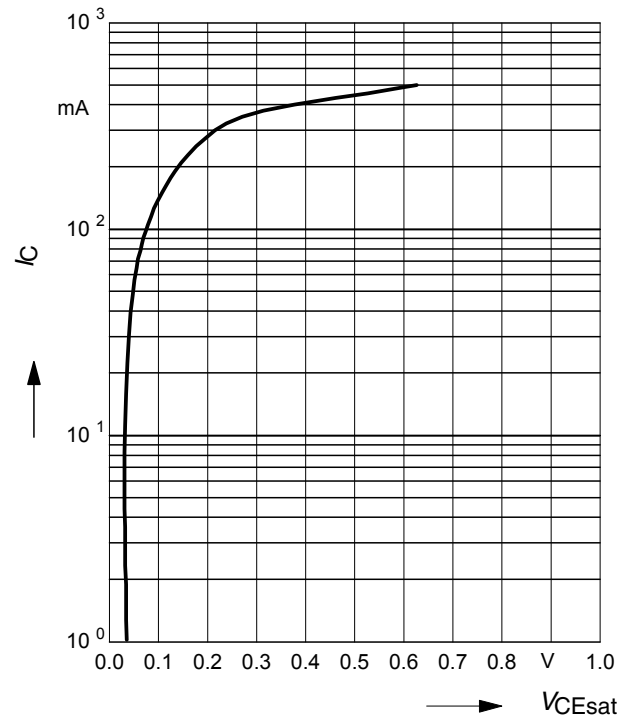
### DC Current Gain $h_{FE} = f(I_C)$

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



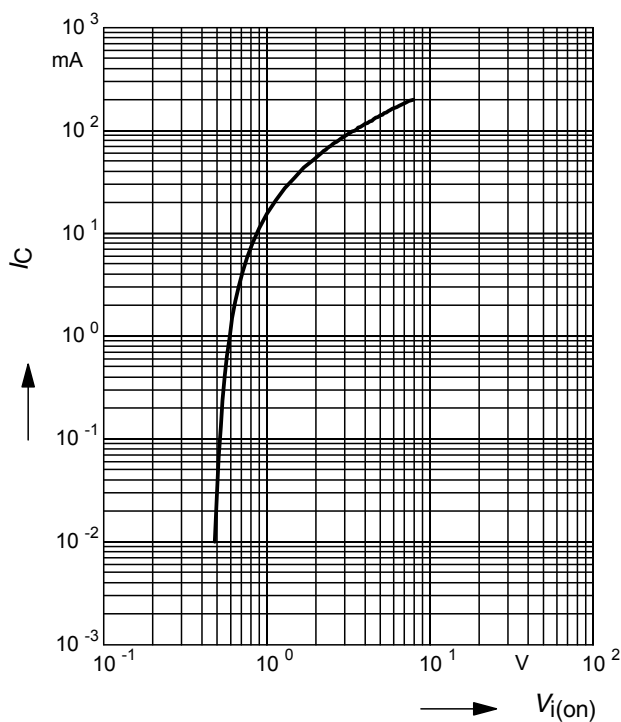
### Collector-Emitter Saturation Voltage

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



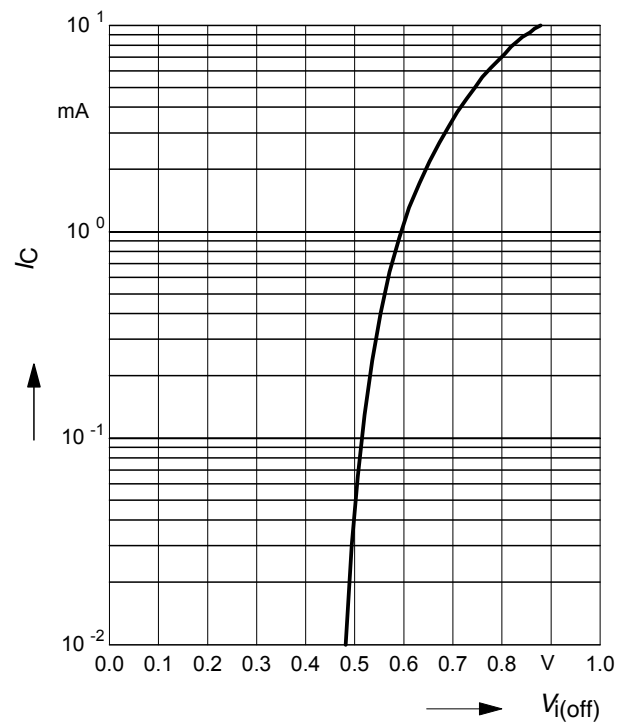
### Input on Voltage $V_{i(on)} = f(I_C)$

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



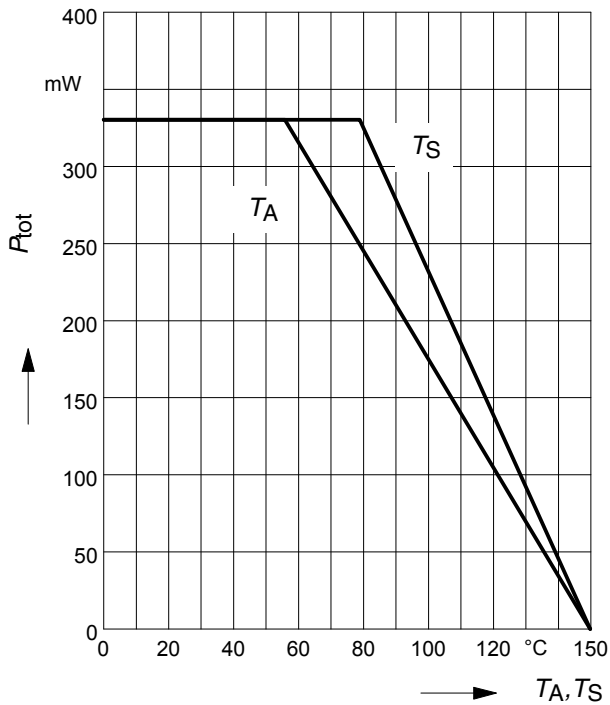
### Input off voltage $V_{i(off)} = f(I_C)$

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

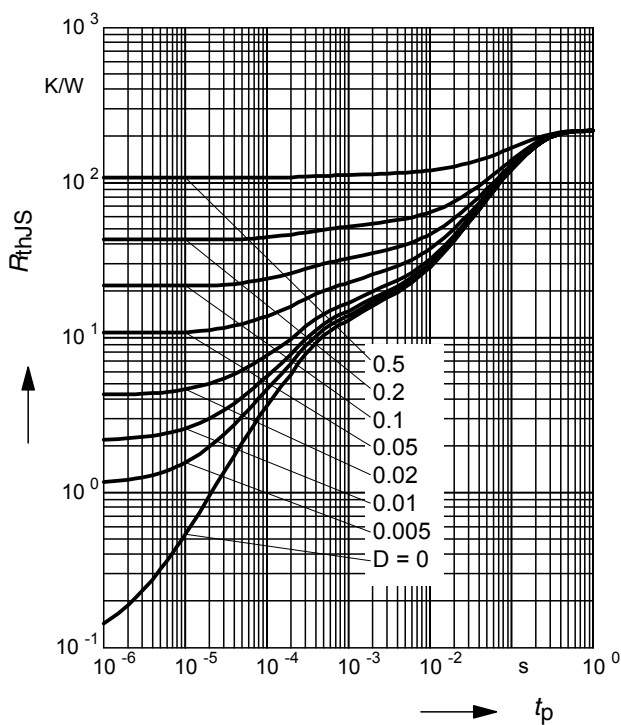


**Total power dissipation**  $P_{\text{tot}} = f(T_A^*; T_S)$

\* Package mounted on epoxy



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



**Permissible Pulse Load**

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

