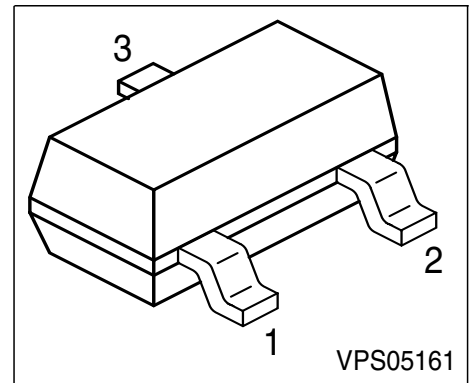
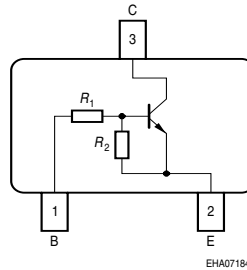


NPN Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ($R_1=2.2k\Omega$, $R_2=10k\Omega$)



| Type | Marking | Pin Configuration | | | Package |
|--------|---------|-------------------|-------|-------|---------|
| BCR505 | XWs | 1 = B | 2 = E | 3 = C | SOT23 |

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 | $V_{i(on)}$ | 12 | |
| 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 - soldering point ¹⁾ | R_{thJS} | ≤ 215 | K/W |
|--|------------|------------|-----|

¹For calculation of R_{thJA} please refer to Application Note Thermal Resistance

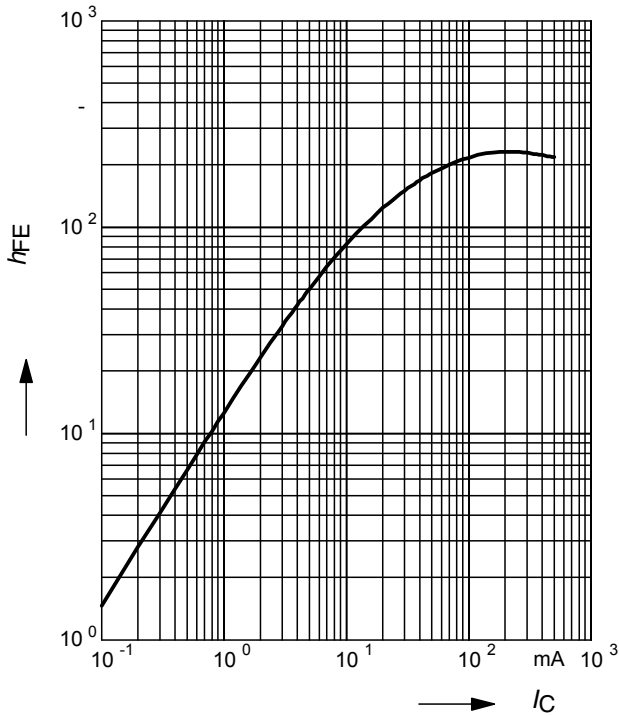
Electrical Characteristics at $T_A=25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|--|---------------|--------|------|------|------------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$ | $V_{(BR)CEO}$ | 50 | - | - | V |
| Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$ | $V_{(BR)CBO}$ | 50 | - | - | |
| Collector cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$ | I_{CBO} | - | - | 100 | nA |
| Emitter cutoff current $V_{EB} = 5 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 0.65 | mA |
| DC current gain 1) $I_C = 50 \text{ mA}, V_{CE} = 5 \text{ V}$ | h_{FE} | 70 | - | - | - |
| Collector-emitter saturation voltage1) $I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$ | V_{CEsat} | - | - | 0.3 | V |
| Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$ | $V_{i(off)}$ | 0.4 | - | 1 | |
| Input on Voltage $I_C = 10 \text{ mA}, V_{CE} = 0.3 \text{ V}$ | $V_{i(on)}$ | 0.5 | - | 1.4 | |
| Input resistor | R_1 | 1.5 | 2.2 | 2.9 | k Ω |
| Resistor ratio | R_1/R_2 | 0.19 | 0.22 | 0.24 | - |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 50 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$ | f_T | - | 100 | - | MHz |

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

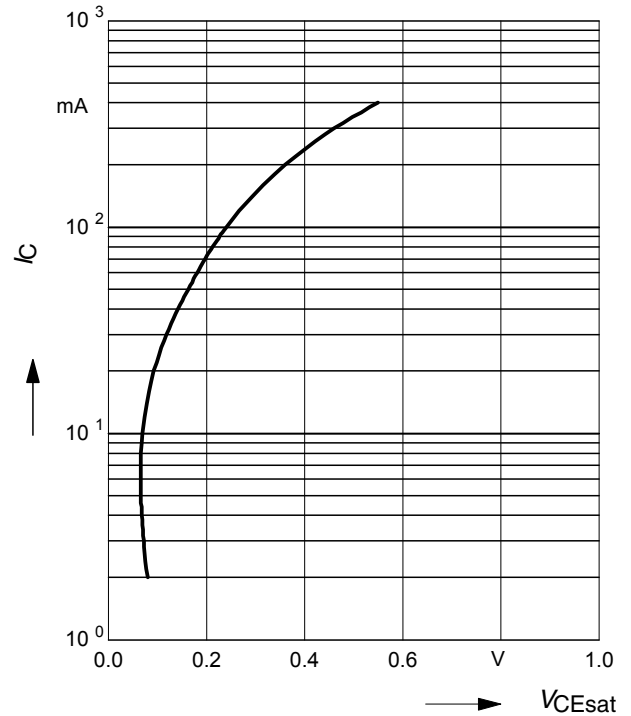
DC Current Gain $h_{FE} = f(I_C)$

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



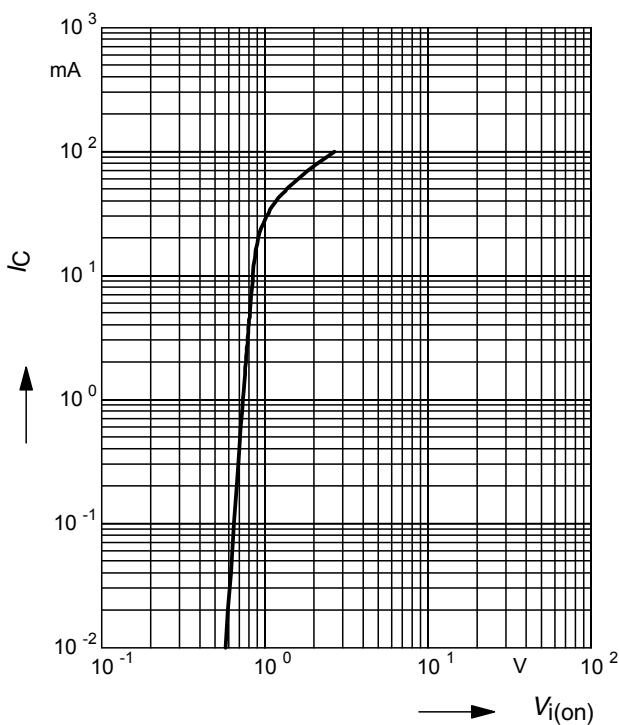
Collector-Emitter Saturation Voltage $V_{CEsat} = f(I_C), h_{FE} = 20$

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



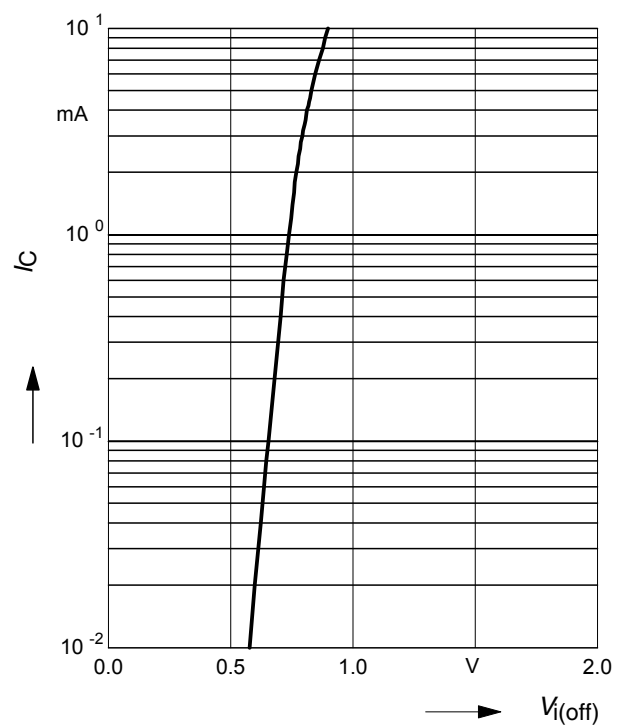
Input on Voltage $V_{i(on)} = f(I_C)$

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

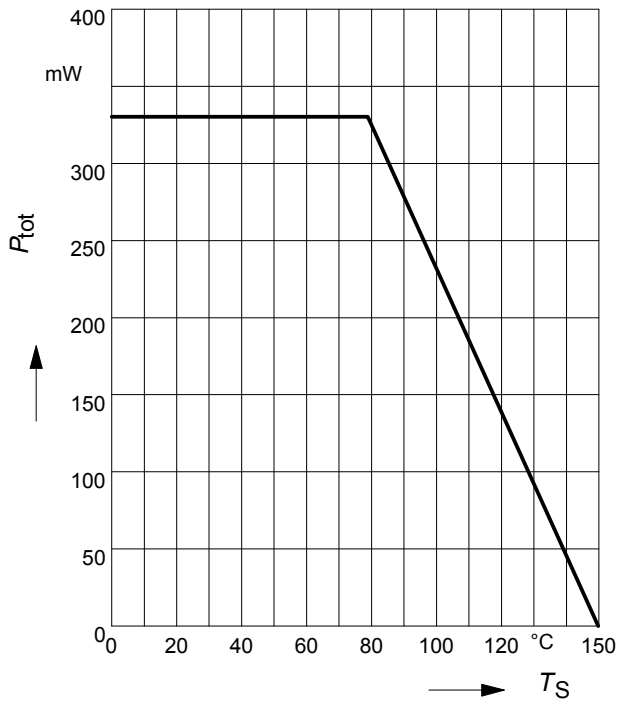


Input off voltage $V_{i(off)} = f(I_C)$

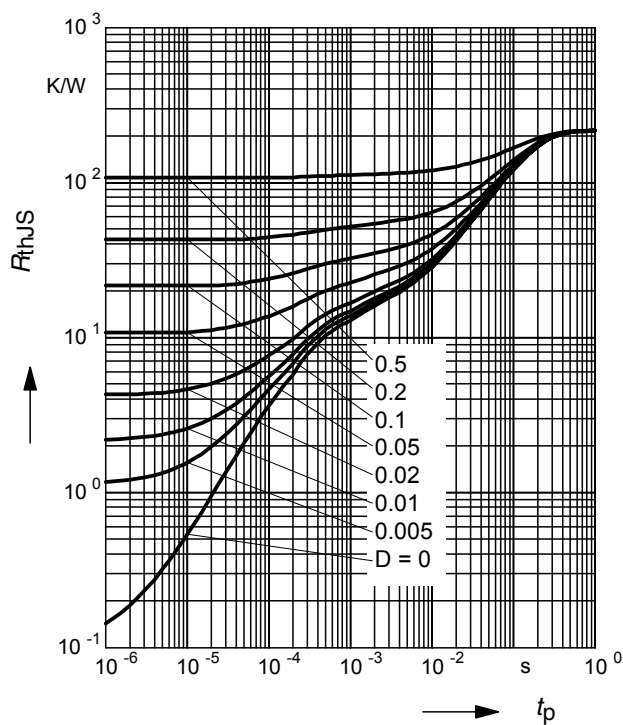
$V_{CE} = 5V$ (common emitter configuration)



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

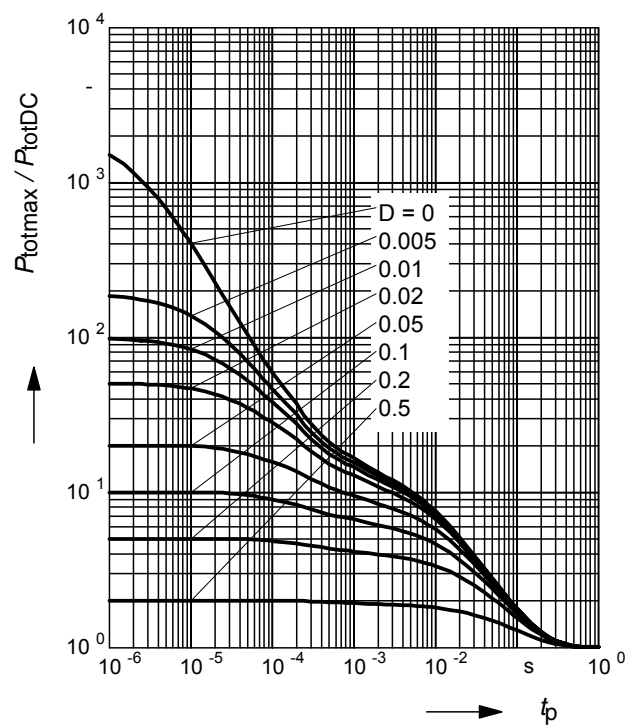


Permissible Pulse Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

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





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