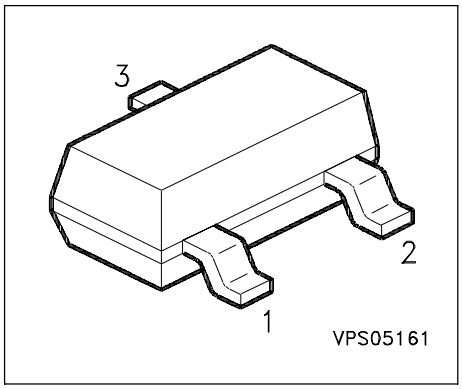
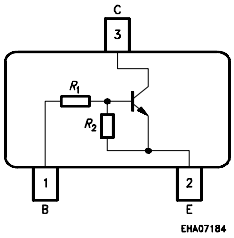
## NPN Silicon Digital Transistor

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




| Type | Marking | Ordering Code | Pin Configuration | | | Package |
|---|---|---|---|---|---|---|
| BCR 505 | XWs | Q62702-C2354 | 1 = B | 2 = E | 3 = C | SOT-23 |

### Maximum Ratings

| Parameter | Symbol | Values | 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, $T_S = 79$ °C | $P_{tot}$ | 330 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature | $T_{stg}$ | - 65 ... + 150 | |

### Thermal Resistance

| | | | |
|---|---|---|---|
| Junction ambient [1)] | $R_{thJA}$ | ≤ 325 | K/W |
| Junction - soldering point | $R_{thJS}$ | ≤ 215 | |

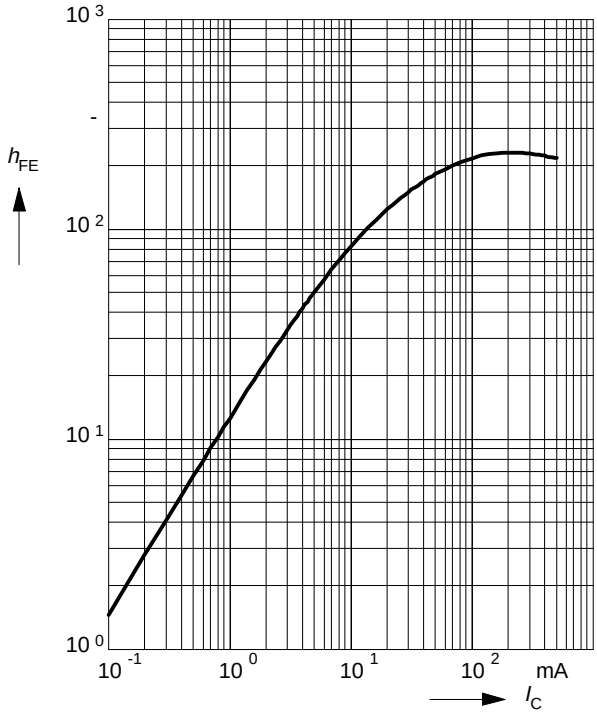
1) Package mounted on pcb 40mm x 40mm x 1.5mm / 6cm$^2$ Cu

**Electrical Characteristics** at $T_A$=25°C, unless otherwise specified

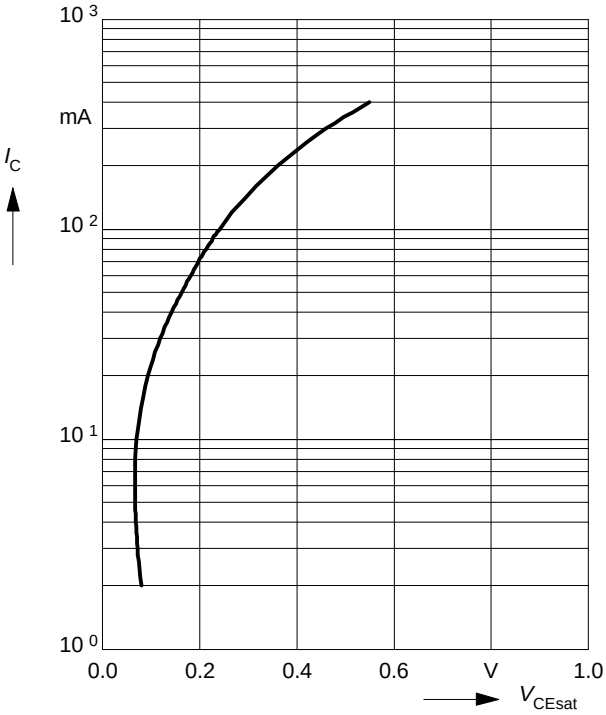
| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **DC Characteristics** | | | | | |
| Collector-emitter breakdown voltage<br>$I_C$ = 100 µA, $I_B$ = 0 | $V_{(BR)CEO}$ | 50 | - | - | V |
| Collector-base breakdown voltage<br>$I_C$ = 10 µA, $I_B$ = 0 |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

1) Pulse test: t < 300µs; D < 2%

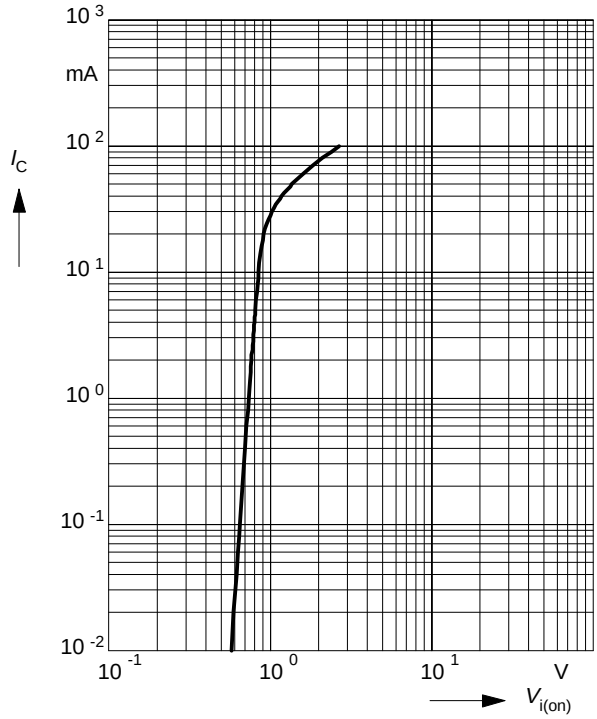
**DC Current Gain** $h_{FE} = f(I_C)$
$V_{CE}$ = 5V (common emitter configuration)



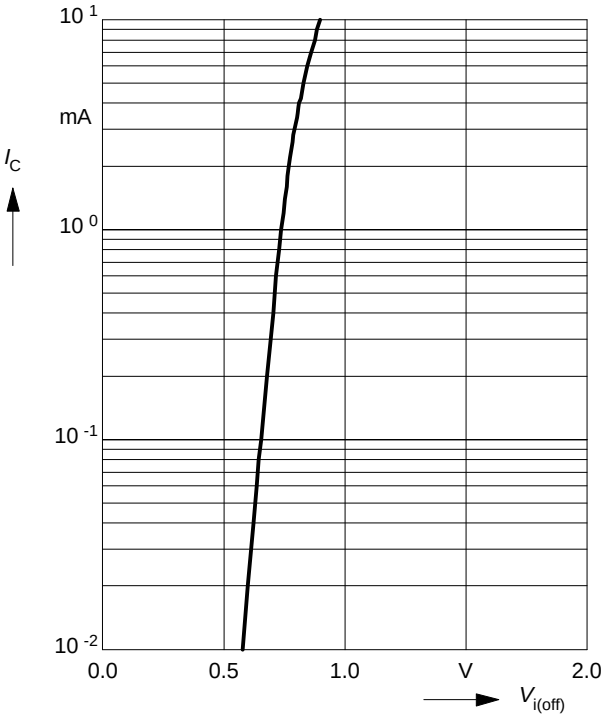

**Collector-Emitter Saturation Voltage**
$V_{CEsat} = f(I_C)$, $h_{FE}$ = 20




**Input on Voltage** $V_{i(on)} = f(I_C)$
$V_{CE}$ = 0.3V (common emitter configuration)

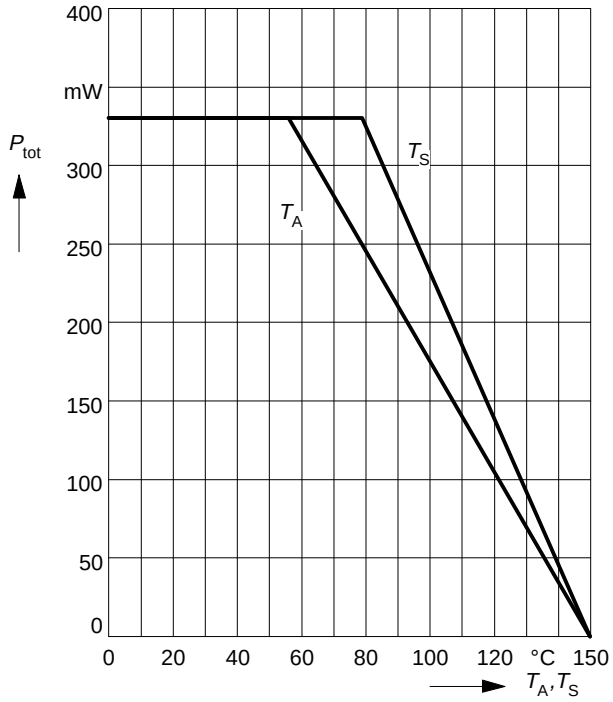



**Input off voltage** $V_{i(off)} = f(I_C)$
$V_{CE}$ = 5V (common emitter configuration)

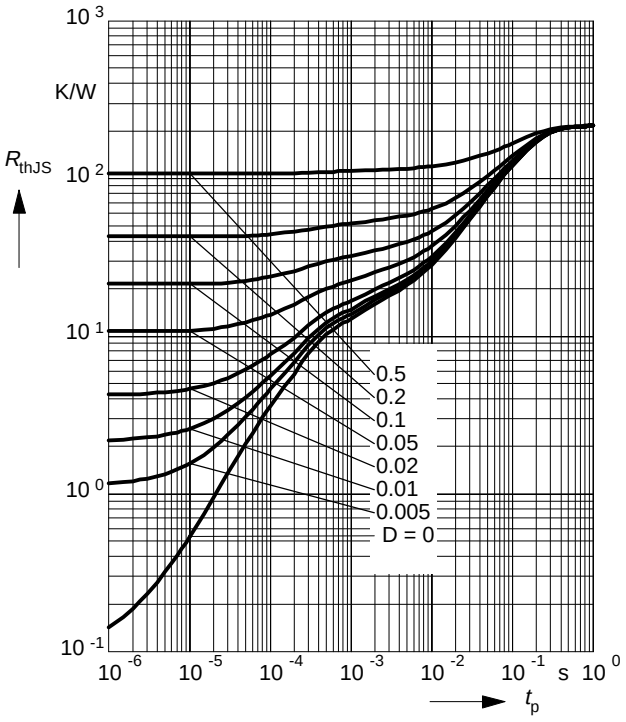


**Total power dissipation** $P_{tot} = f(T_A^*; T_S)$

* Package mounted on epoxy




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




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