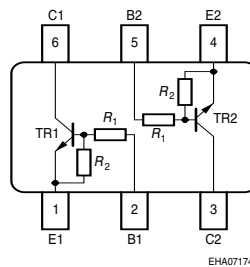
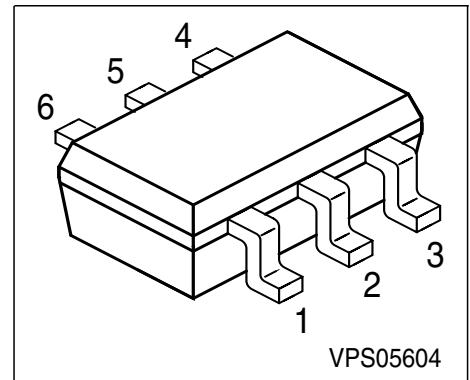


## NPN Silicon Digital Transistor Array

- Switching circuit, inverter, interface circuit, driver circuit
- Two ( galvanic) internal isolated Transistors with good matching in one package
- Built in bias resistor ( $R_1=4.7k\Omega$ ,  $R_2=47k\Omega$ )



| Type    | Marking | Pin Configuration |      |      |      |      |      | Package |
|---------|---------|-------------------|------|------|------|------|------|---------|
| BCR116S | WG5     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363  |

### 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                               | $V_{I(on)}$ | 15          |      |
| 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>1)</sup> | $R_{thJS}$ | $\leq 140$ | K/W |
|------------------------------------------|------------|------------|-----|

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

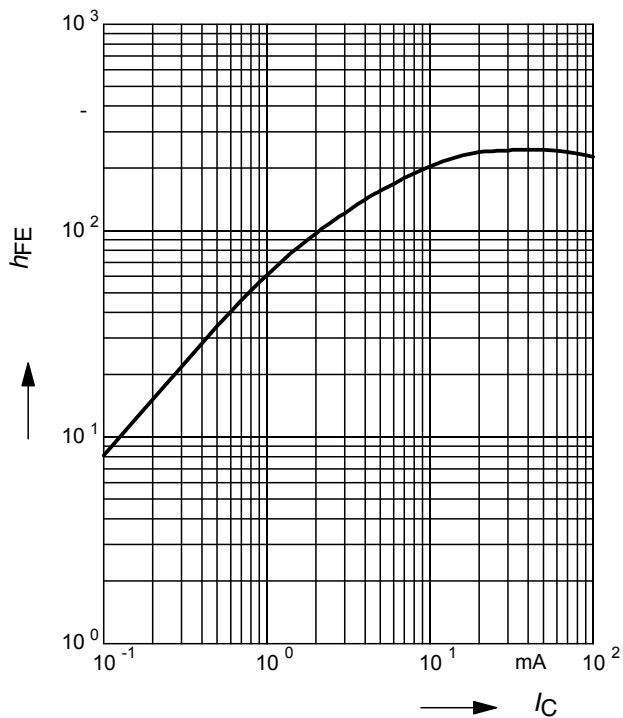
**Electrical Characteristics** at  $T_A=25^{\circ}\text{C}$ , unless otherwise specified

| Parameter                                                                                             | Symbol                      | Values |      |      | Unit          |
|-------------------------------------------------------------------------------------------------------|-----------------------------|--------|------|------|---------------|
|                                                                                                       |                             | min.   | typ. | max. |               |
| DC Characteristics                                                                                    |                             |        |      |      |               |
| Collector-emitter breakdown voltage<br>$I_C = 100\ \mu\text{A}$ , $I_B = 0$                           | $V_{(\text{BR})\text{CEO}}$ | 50     | -    | -    | V             |
| Collector-base breakdown voltage<br>$I_C = 10\ \mu\text{A}$ , $I_E = 0$                               | $V_{(\text{BR})\text{CBO}}$ | 50     | -    | -    |               |
| Collector cutoff current<br>$V_{\text{CB}} = 40\ \text{V}$ , $I_E = 0$                                | $I_{\text{CBO}}$            | -      | -    | 100  | nA            |
| Emitter cutoff current<br>$V_{\text{EB}} = 5\ \text{V}$ , $I_C = 0$                                   | $I_{\text{EBO}}$            | -      | -    | 155  | $\mu\text{A}$ |
| 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>$I_C = 100\ \mu\text{A}$ , $V_{\text{CE}} = 5\ \text{V}$                         | $V_{\text{i(off)}}$         | 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    | -    | 1.4  |               |
| Input resistor                                                                                        | $R_1$                       | 3.2    | 4.7  | 6.2  | k $\Omega$    |
| Resistor ratio                                                                                        | $R_1/R_2$                   | 0.09   | 0.1  | 0.11 | -             |
| AC Characteristics                                                                                    |                             |        |      |      |               |
| Transition frequency<br>$I_C = 10\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$ , $f = 100\ \text{MHz}$ | $f_{\text{T}}$              | -      | 160  | -    | MHz           |
| Collector-base capacitance<br>$V_{\text{CB}} = 10\ \text{V}$ , $f = 1\ \text{MHz}$                    | $C_{\text{cb}}$             | -      | 3    | -    | pF            |

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

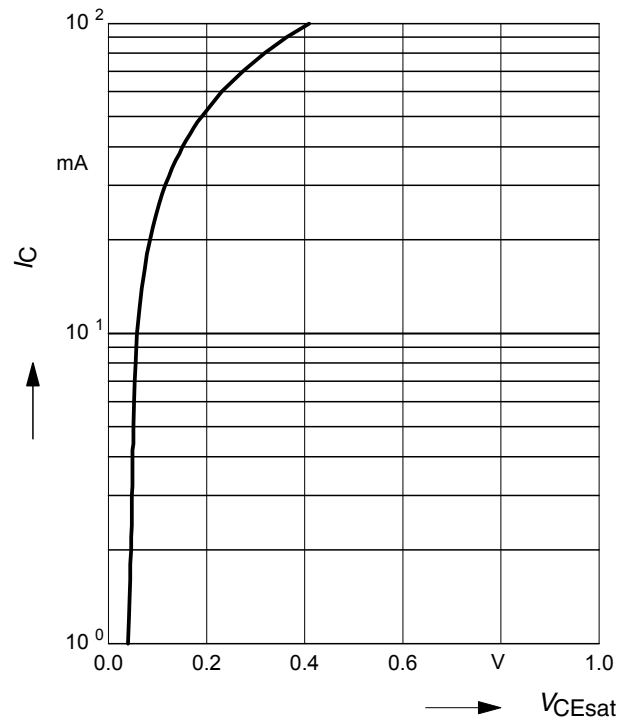
### DC Current Gain $h_{FE} = f(I_C)$

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



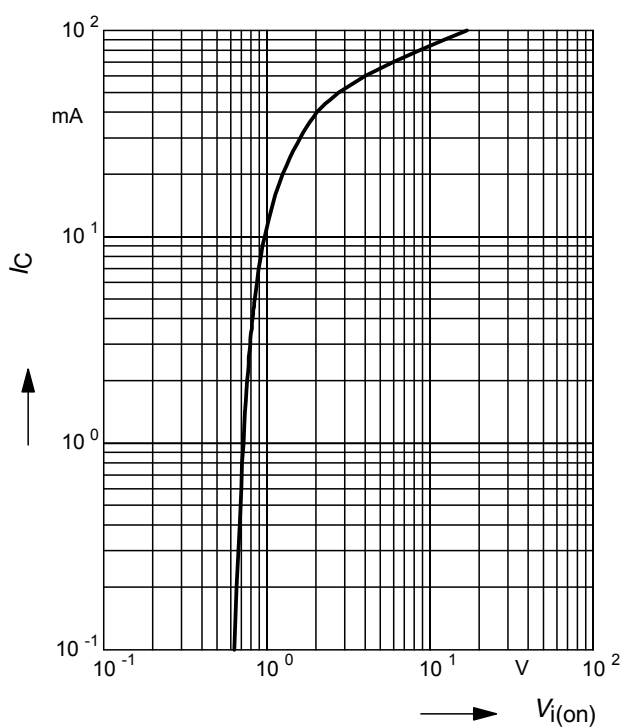
### Collector-Emitter Saturation Voltage

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



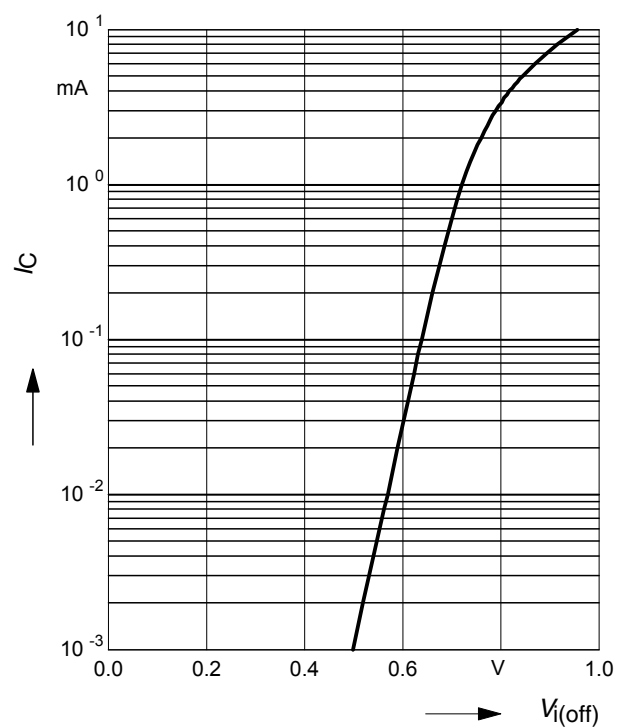
### Input on Voltage $V_{i(on)} = f(I_C)$

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

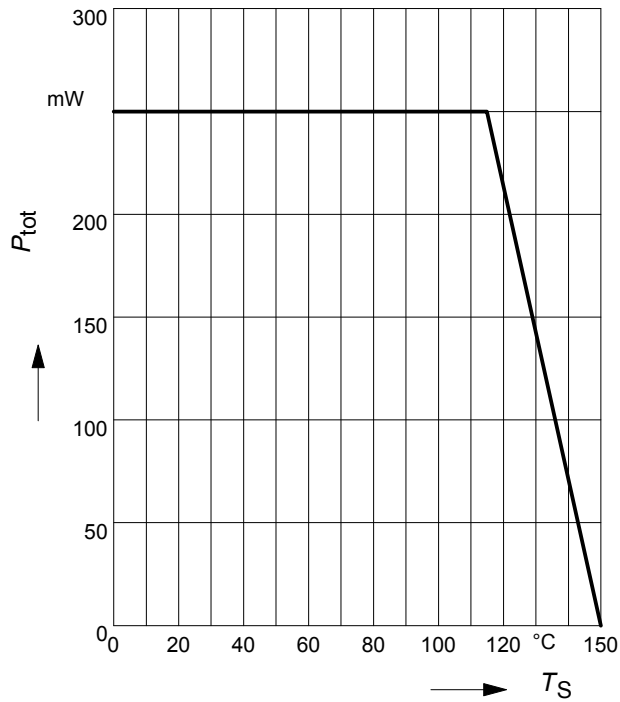


### Input off voltage $V_{i(off)} = f(I_C)$

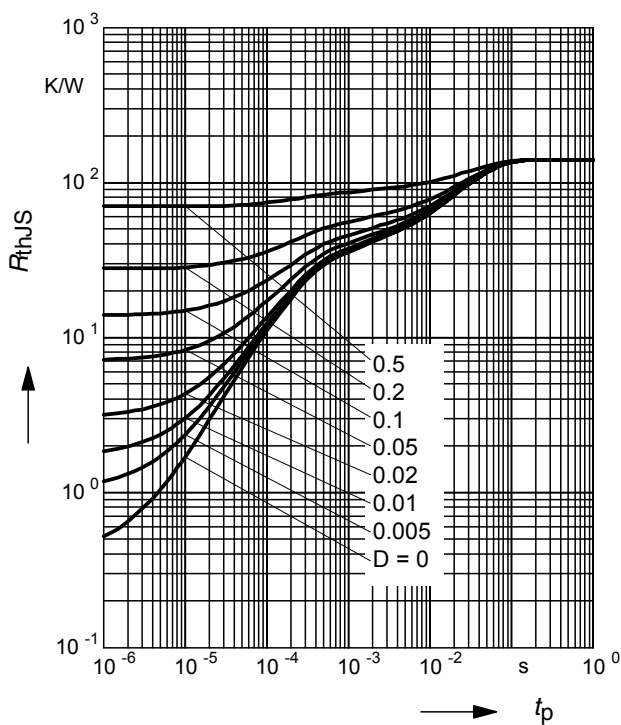
$V_{CE} = 5V$  (common emitter configuration)



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



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



**Permissible Pulse Load**

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

