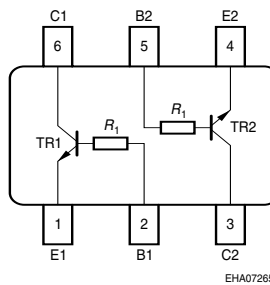
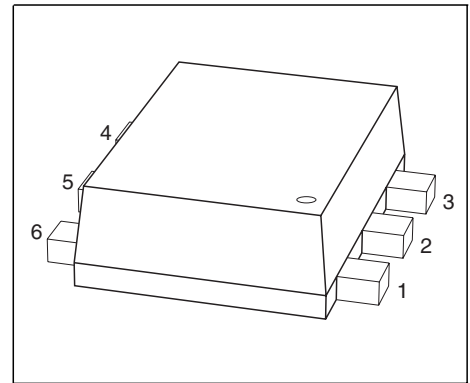


**NPN Silicon Digital Transistor Array**
**Preliminary data**

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



| Type | Marking | Pin Configuration |      |      |      |      | Package |        |
|------|---------|-------------------|------|------|------|------|---------|--------|
| SEM7 | WK      | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1    | SOT666 |

**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, $T_S = 75\text{ }^\circ\text{C}$ | $P_{tot}$   | 250         | mW               |
| Junction temperature                                      | $T_j$       | 150         | $^\circ\text{C}$ |
| Storage temperature                                       | $T_{stg}$   | -65 ... 150 |                  |

**Thermal Resistance**

|  |            |            |     |
|--|------------|------------|-----|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | $\leq 300$ | K/W |
|--|------------|------------|-----|

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

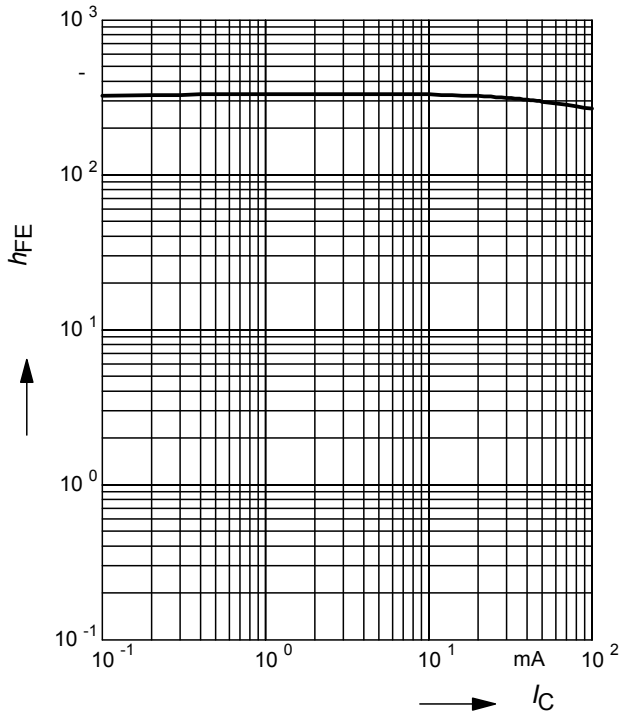
**Electrical Characteristics at  $T_A=25^\circ\text{C}$ , unless otherwise specified**

| Parameter  | Symbol        | Values |      |      | Unit       |
|--|---------------|--------|------|------|------------|
|  |               | min.   | typ. | max. |            |
| <b>DC Characteristics</b>  |               |        |      |      |            |
| Collector-emitter breakdown voltage<br>$I_C = 100 \mu\text{A}, I_B = 0$                  | $V_{(BR)CEO}$ | 50     | -    | -    | V          |
| Collector-base breakdown voltage<br>$I_C = 10 \mu\text{A}, I_E = 0$                      | $V_{(BR)CBO}$ | 50     | -    | -    |            |
| Emitter-base breakdown voltage<br>$I_E = 10 \mu\text{A}, I_C = 0$                        | $V_{(BR)EBO}$ | 5      | -    | -    |            |
| Collector cutoff current<br>$V_{CB} = 40 \text{ V}, I_E = 0$                             | $I_{CBO}$     | -      | -    | 100  | nA         |
| DC current gain 1)<br>$I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$                         | $h_{FE}$      | 120    | -    | 630  | -          |
| Collector-emitter saturation voltage1)<br>$I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$    | $V_{CEsat}$   | -      | -    | 0.3  | V          |
| Input off voltage<br>$I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$                       | $V_{i(off)}$  | 0.4    | -    | 0.8  |            |
| Input on Voltage<br>$I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$                         | $V_{i(on)}$   | 0.5    | -    | 1.1  |            |
| Input resistor   | $R_1$         | 3.2    | 4.7  | 6.2  | k $\Omega$ |
| <b>AC Characteristics</b>  |               |        |      |      |            |
| Transition frequency<br>$I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$ | $f_T$         | -      | 150  | -    | MHz        |
| Collector-base capacitance<br>$V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$                 | $C_{cb}$      | -      | 3    | -    | pF         |

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

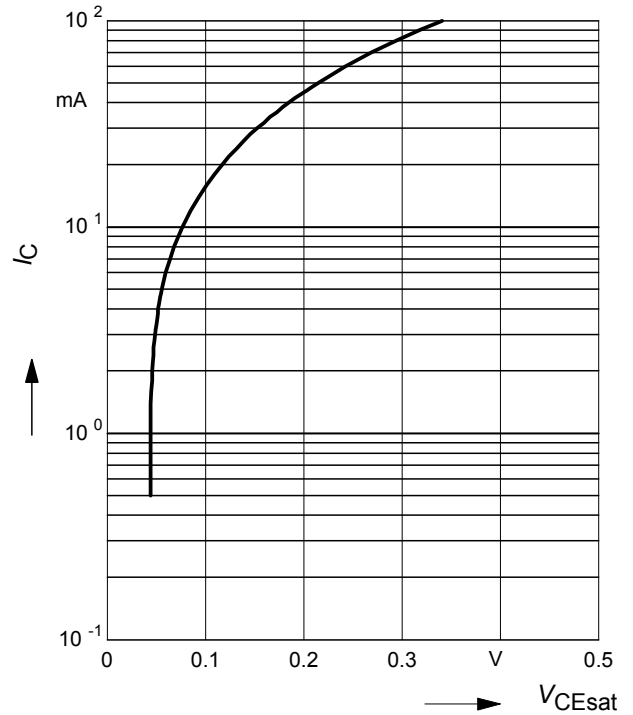
**DC Current Gain  $h_{FE} = f(I_C)$**

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



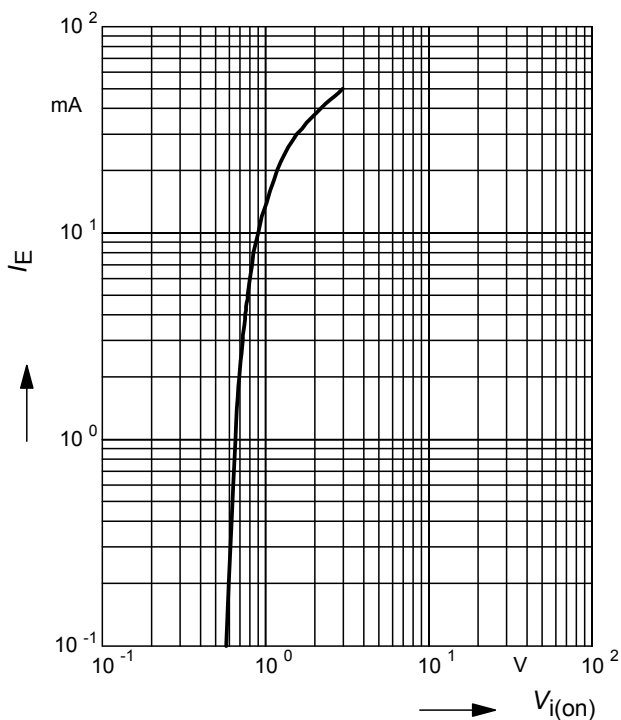
**Collector-Emitter Saturation Voltage**

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



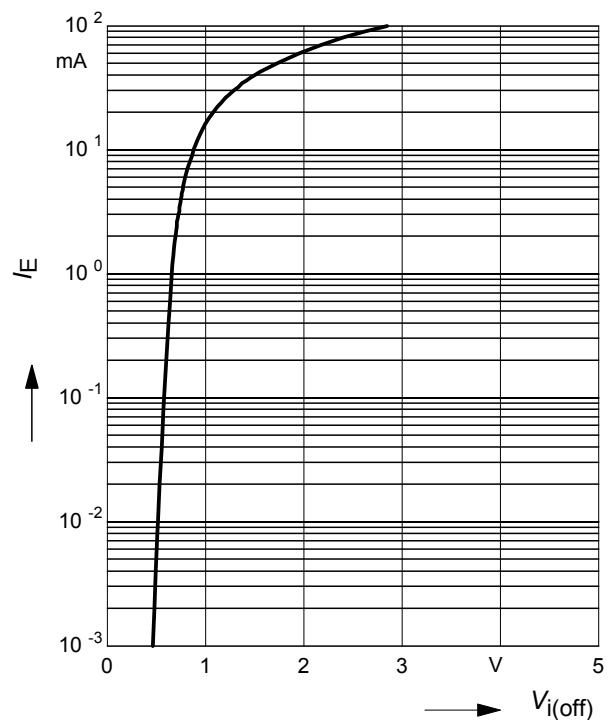
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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

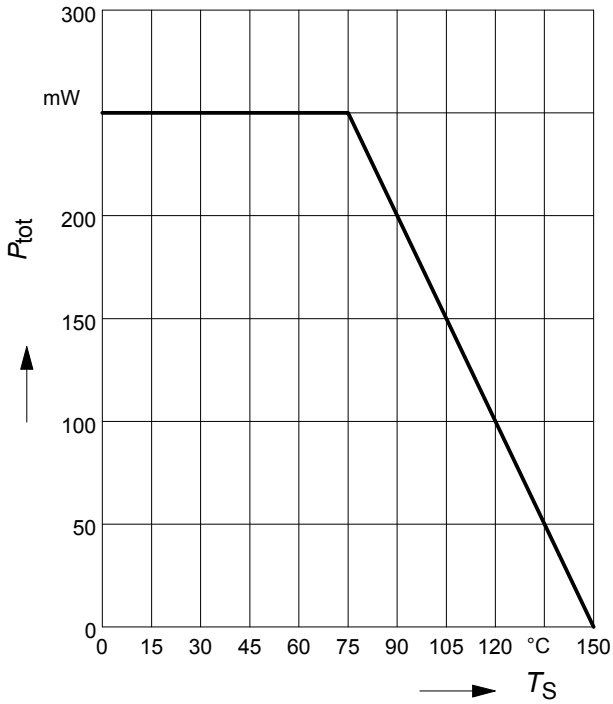


**Input off voltage  $V_{i(off)} = f(I_C)$**

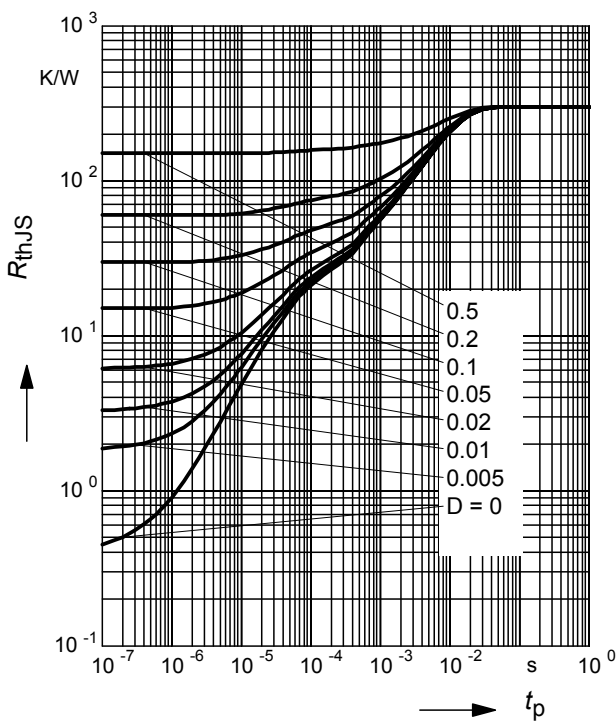
$V_{CE} = 5V$  (common emitter configuration)



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



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



**Permissible Pulse Load**

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

