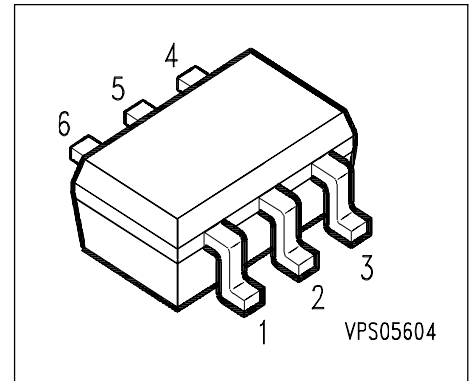
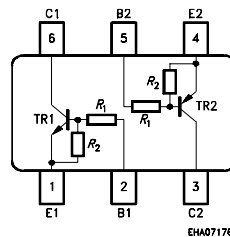
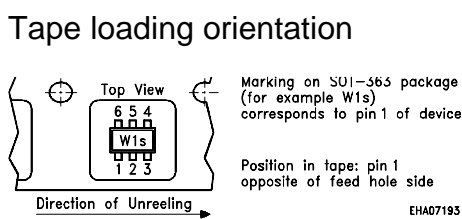


## NPN/PNP Silicon Digital Transistor Array

- Switching circuit, inverter, interface circuit, drive circuit
- Two (galvanic) internal isolated NPN/PNP Transistor in one package
- Built in bias resistor
  - NPN:  $R_1 = 47k\Omega$ ,  $R_2 = 47k\Omega$
  - PNP:  $R_1 = 2.2k\Omega$ ,  $R_2 = 47k\Omega$



### Tape loading orientation



Type	Marking	Ordering Code	Pin Configuration				Package		
BCR 48PN	WTs	Q62702-C2496	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT-363

### Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	$V_{CEO}$	50	V
Collector-base voltage	$V_{CBO}$	50	V
Emitter-base voltage	NPN $V_{EBO}$	10	V
Emitter-base voltage	PNP $V_{EBO}$	5	V
DC collector current	NPN $I_C$	70	mA
DC collector current	PNP $I_C$	100	mA
Input on voltage	NPN $V_{i(on)}$	50	V
Input on voltage	PNP $V_{i(on)}$	10	V
Total power dissipation, $T_S = 115^\circ\text{C}$	$P_{tot}$	250	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	- 65 ... + 150	$^\circ\text{C}$

### Thermal Resistance

Junction ambient <sup>1)</sup>	$R_{thJA}$	$\leq 275$	K/W
Junction - soldering point	$R_{thJS}$	$\leq 140$	K/W

1) Package mounted on pcb 40mm x 40mm x 1.5mm / 0.5cm<sup>2</sup> Cu

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics for NPN Type</b>					
Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter cutoff current $V_{EB} = 10 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	164	$\mu\text{A}$
DC current gain $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{FE}$	70	-	-	-
Collector-emitter saturation voltage 1) $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$	$V_{CEsat}$	-	-	0.3	mV
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(off)}$	0.8	-	1.5	V
Input on Voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(on)}$	1	-	3	
Input resistor	$R_1$	32	47	62	$\text{k}\Omega$
Resistor ratio	$R_1/R_2$	0.9	1	1.1	-

### AC Characteristics for NPN Type

Transition frequency $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	100	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	$C_{cb}$	-	3	-	pF

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

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics for PNP Type</b>					
Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter cutoff current $V_{EB} = 5 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	164	
DC current gain $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}, BC \dots 16 \text{ W}$	$h_{FE}$	70	-	-	-
Collector-emitter saturation voltage 1) $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$	$V_{CEsat}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(off)}$	0.4	-	0.8	
Input on voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(on)}$	0.5	-	1.1	
Input resistor	$R_1$	1.5	2.2	2.9	k $\Omega$
Resistor ratio	$R_1/R_2$	0.042	0.047	0.052	-

### AC Characteristics for PNP Type

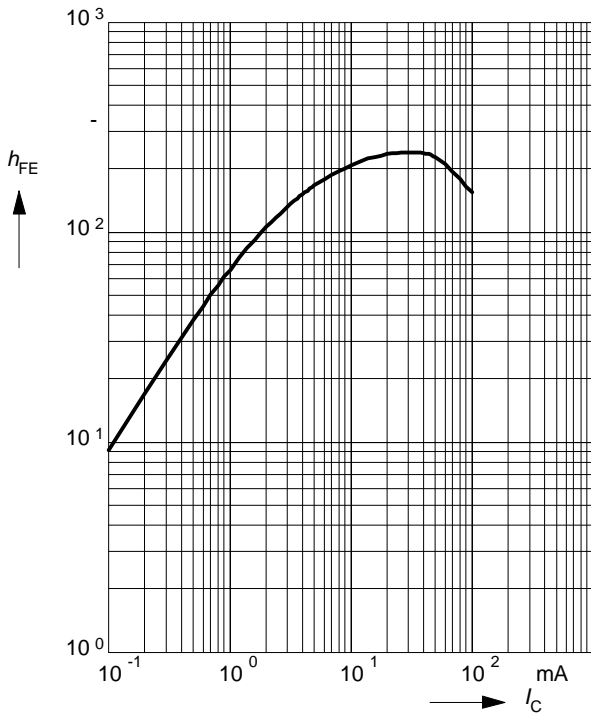
Transition frequency $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	200	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	$C_{cb}$	-	3	-	pF

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

## NPN TYPE

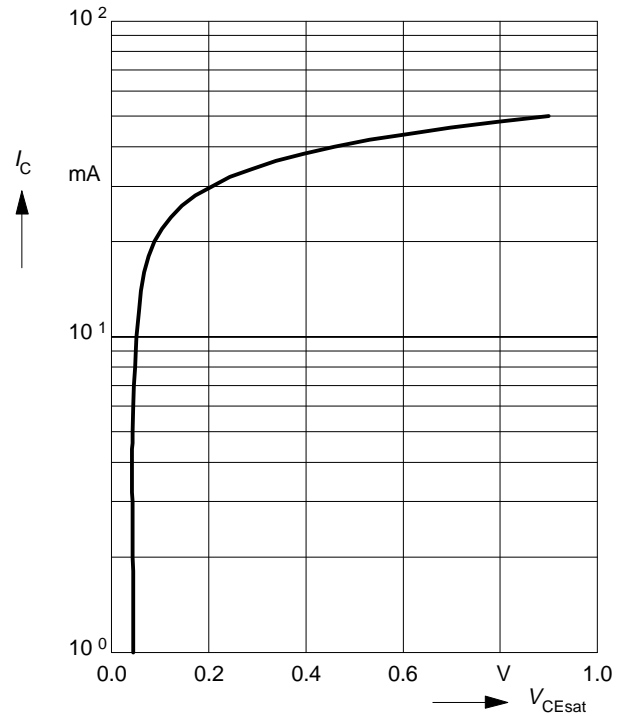
**DC Current Gain**  $h_{FE} = f(I_C)$

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



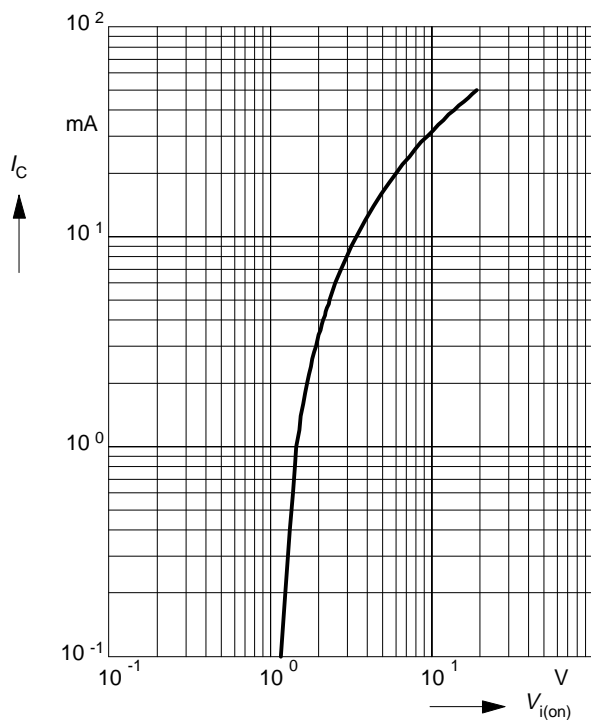
**Collector-Emitter Saturation Voltage**

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



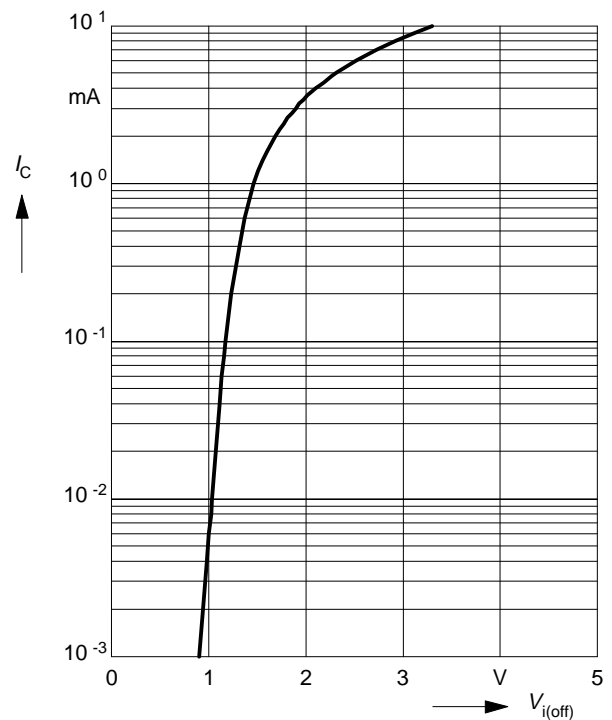
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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



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

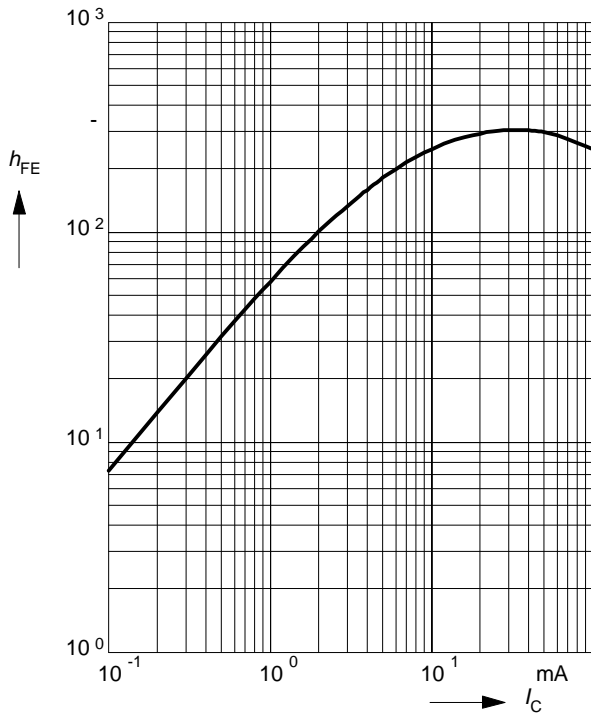
$V_{CE} = 5V$  (common emitter configuration)



## PNP TYPE

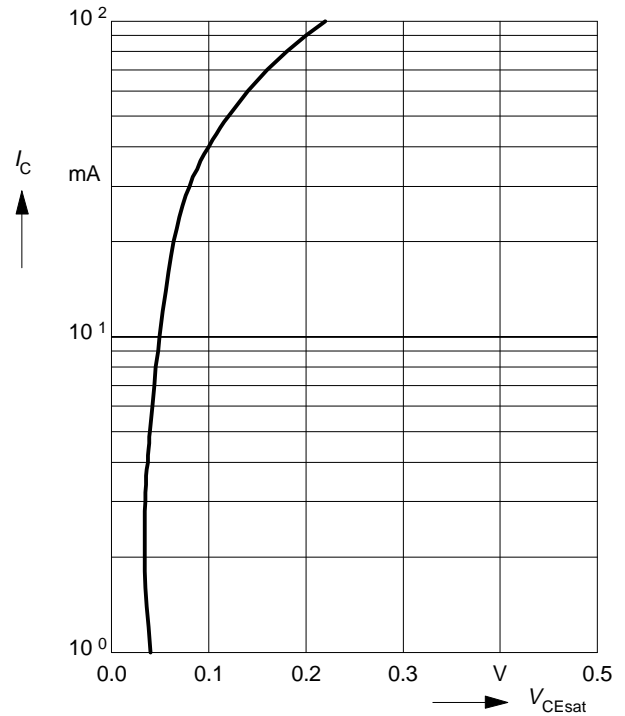
**DC Current Gain**  $h_{FE} = f(I_C)$

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



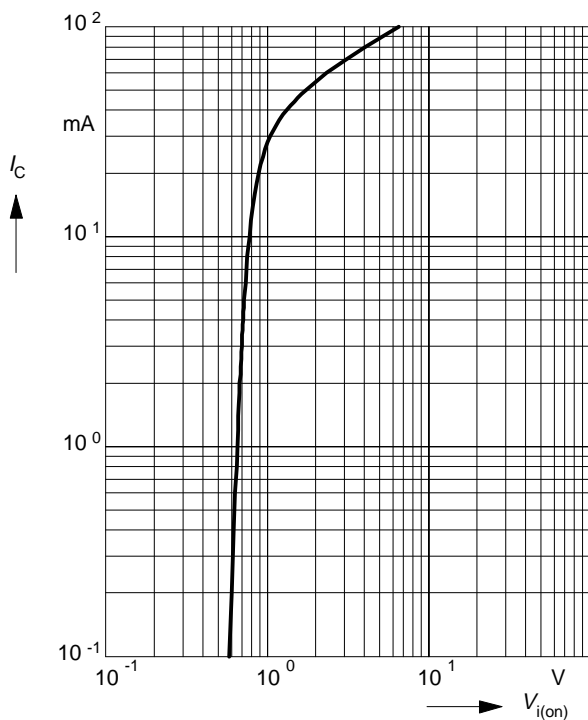
**Collector-Emitter Saturation Voltage**

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



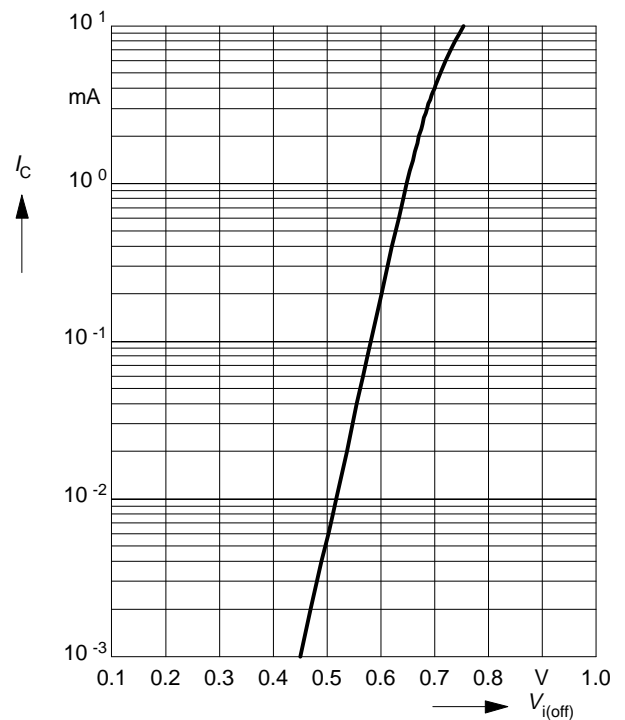
**Input on Voltage**  $V_{i(on)} = f(I_C)$

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



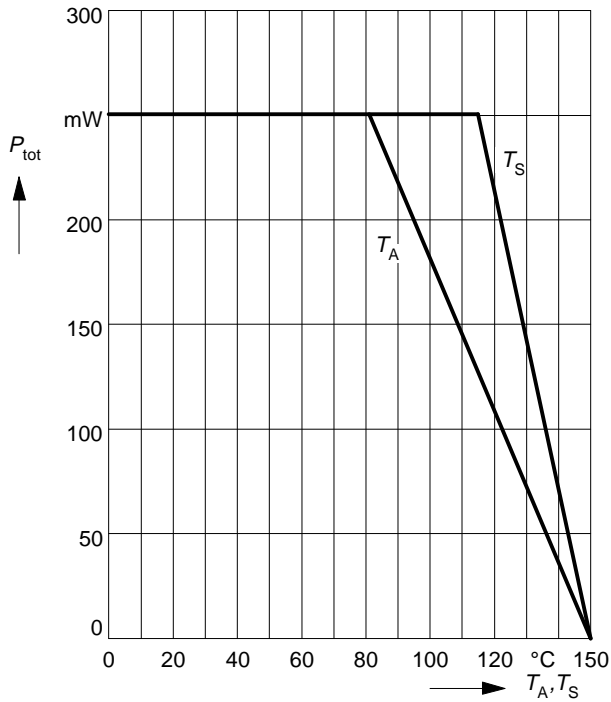
**Input off voltage**  $V_{i(off)} = f(I_C)$

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

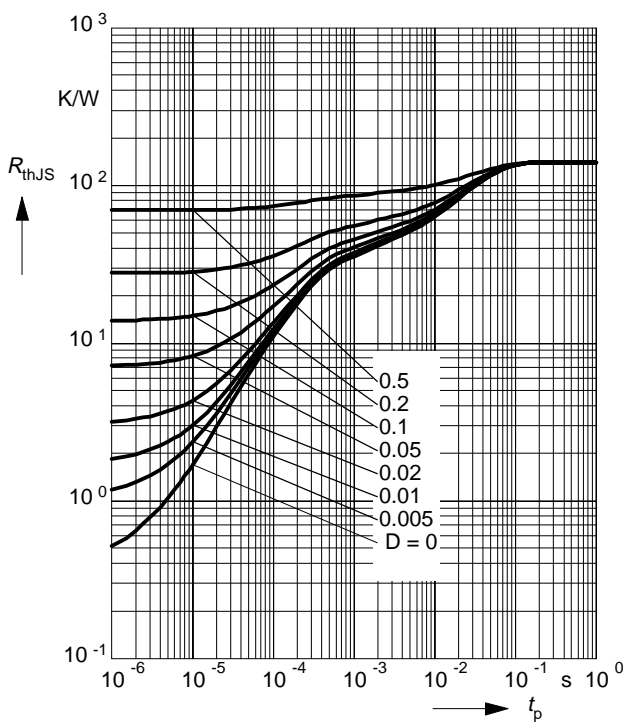


### Total power dissipation $P_{tot} = f(T_A^*; T_S)$

\* Package mounted on epoxy



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



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

