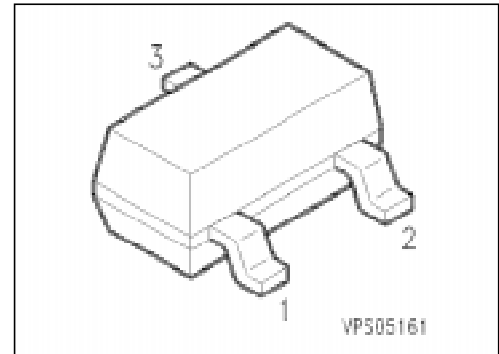


## NPN Silicon Switching Transistors

**BSS 79**  
**BSS 81**

- High DC current gain
- Low collector-emitter saturation voltage
- Complementary types: BSS 80, BSS 82 (PNP)



Type	Marking	Ordering Code (tape and reel)	Pin Configuration			Package <sup>1)</sup>
			1	2	3	
BSS 79 B	CEs	Q62702-S503	B	E	C	SOT-23
BSS 79 C	CFs	Q62702-S501				
BSS 81 B	CDs	Q62702-S555				
BSS 81 C	CGs	Q62702-S605				

### Maximum Ratings

Parameter	Symbol	Values		Unit
		BSS 79	BSS 81	
Collector-emitter voltage	$V_{CE0}$	40	35	V
Collector-base voltage	$V_{CB0}$	75		
Emitter-base voltage	$V_{EB0}$	6		
Collector current	$I_C$	800		mA
Peak collector current	$I_{CM}$	1		A
Base current	$I_B$	100		mA
Peak base current	$I_{BM}$	200		
Total power dissipation, $T_s = 77\text{ °C}$	$P_{tot}$	330		mW
Junction temperature	$T_j$	150		°C
Storage temperature range	$T_{stg}$	- 65 ... + 150		

### Thermal Resistance

Junction - ambient <sup>2)</sup>	$R_{th\ JA}$	≤ 290	K/W
Junction - soldering point	$R_{th\ JS}$	≤ 220	

<sup>1)</sup> For detailed information see chapter Package Outlines.

<sup>2)</sup> Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm<sup>2</sup> Cu.

## Electrical Characteristics

at  $T_A = 25\text{ °C}$ , unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC characteristics</b>					
Collector-emitter breakdown voltage $I_C = 10\text{ mA}$	$V_{(BR)CE0}$	40	–	–	V
BSS 79		35	–	–	
BSS 81			–	–	
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$	$V_{(BR)CB0}$	75	–	–	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$	$V_{(BR)EB0}$	6	–	–	
Collector-base cutoff current $V_{CB} = 60\text{ V}$ $V_{CB} = 60\text{ V}, T_A = 150\text{ °C}$	$I_{CB0}$	–	–	10	nA
Emitter-base cutoff current $V_{EB} = 3\text{ V}$	$I_{EB0}$	–	–	10	$\mu\text{A}$
DC current gain $I_C = 100\text{ }\mu\text{A}, V_{CE} = 10\text{ V}$	$h_{FE}$	20	–	–	–
BSS 79 B/81 B		35	–	–	
BSS 79 C/81 C		25	–	–	
$I_C = 1\text{ mA}, V_{CE} = 10\text{ V}$		50	–	–	
BSS 79 B/81 B		35	–	–	
BSS 79 C/81 C		75	–	–	
$I_C = 10\text{ mA}, V_{CE} = 10\text{ V}^{1)}$		40	–	120	
BSS 79 B/81 B		100	–	300	
BSS 79 C/81 C		25	–	–	
$I_C = 150\text{ mA}, V_{CE} = 10\text{ V}^{1)}$		40	–	–	
BSS 79 B/81 B					
BSS 79 C/81 C					
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 150\text{ mA}, I_B = 15\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$	$V_{CEsat}$	–	–	0.3 1.3	V
Base-emitter saturation voltage <sup>1)</sup> $I_C = 150\text{ mA}, I_B = 15\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$	$V_{BEsat}$	–	–	1.2 2.0	

<sup>1)</sup> Pulse test conditions:  $t \leq 300\text{ }\mu\text{s}, D = 2\%$ .

## Electrical Characteristics

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

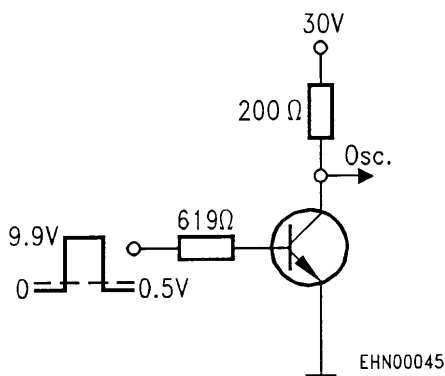
Parameter	Symbol	Values			Unit
		min.	typ.	max.	

## AC characteristics

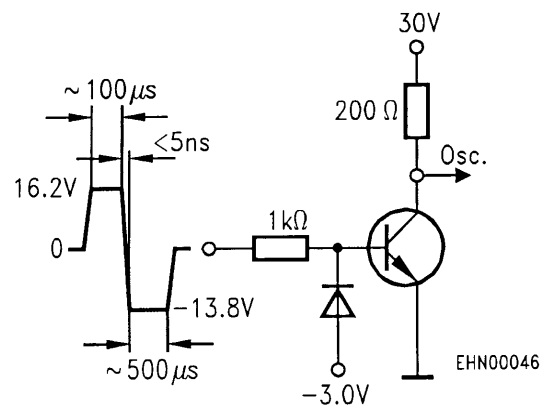
Transition frequency $I_C = 20\text{ mA}$ , $V_{CE} = 20\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	—	250	—	MHz
Open-circuit output capacitance $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{obo}$	—	6	—	pF
$V_{CC} = 30\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = I_{B2} = 15\text{ mA}$ , $V_{BE} = 0.5\text{ V}$					
Delay time	$t_d$	—	—	10	ns
Rise time	$t_r$	—	—	25	ns
Storage time	$t_{stg}$	—	—	250	ns
Fall time	$t_f$	—	—	60	ns

## Test circuits

### Delay and rise time



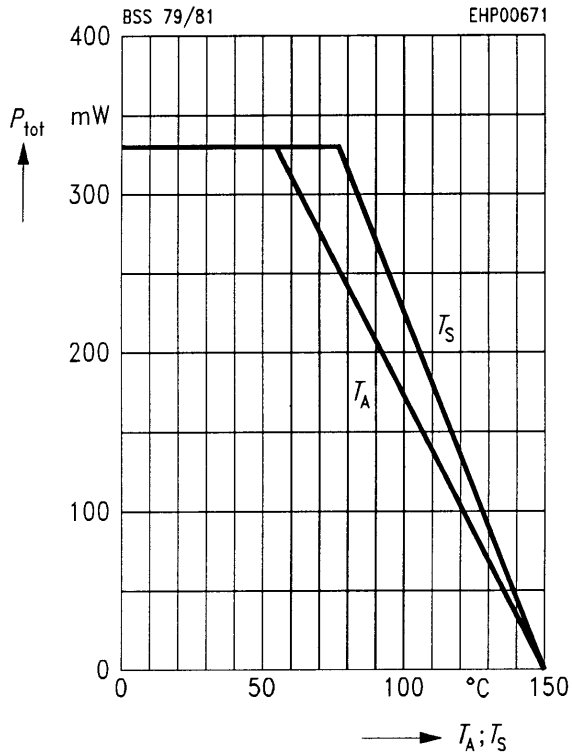
### Storage and fall time



Oscillograph:  $R > 100\text{ k}\Omega$   
 $C < 12\text{ pF}$   
 $t_r < 5\text{ ns}$

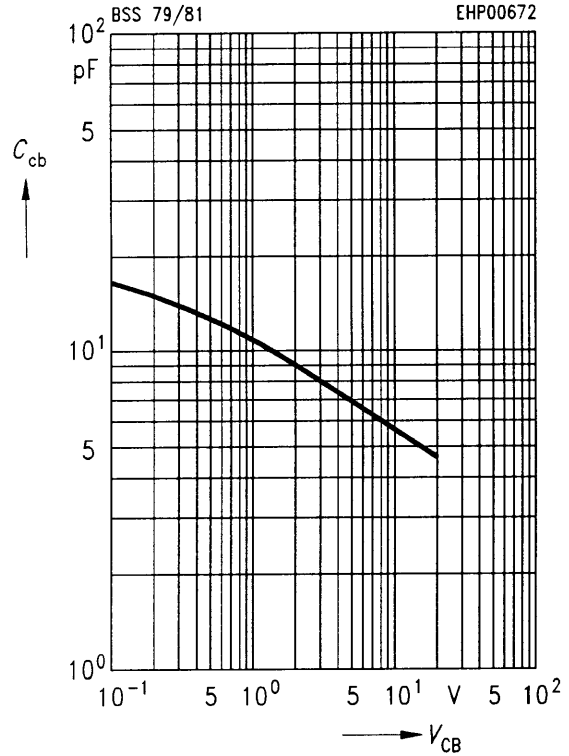
**Total power dissipation  $P_{tot} = f(T_A^*; T_S)$**

\* Package mounted on epoxy

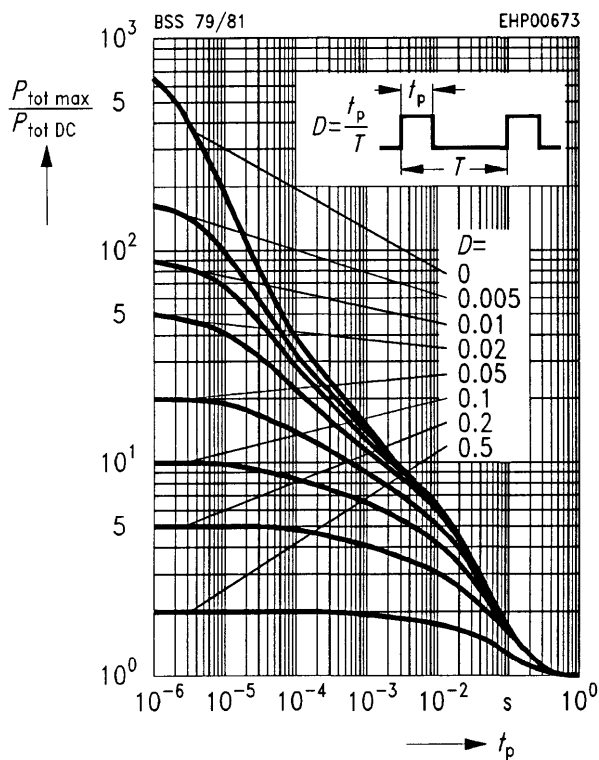


**Collector-base capacitance  $C_{cb} = f(V_{CB})$**

$f = 1 \text{ MHz}$

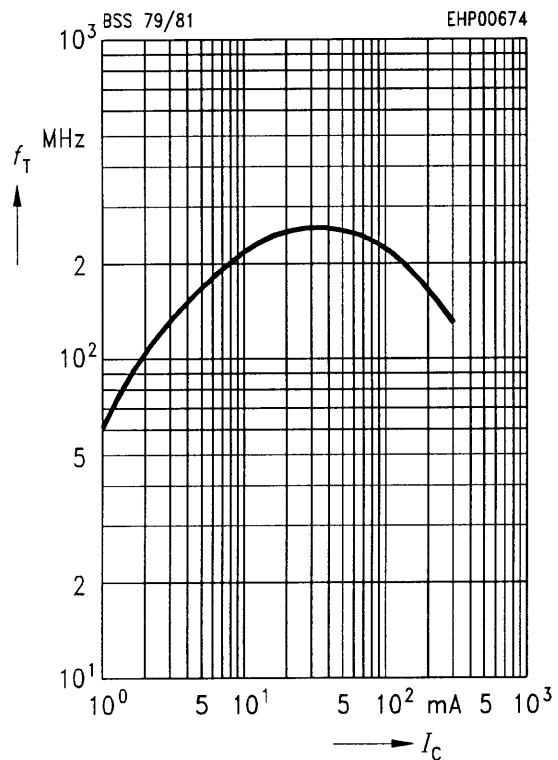


**Permissible pulse load  $P_{tot max}/P_{tot DC} = f(t_p)$**

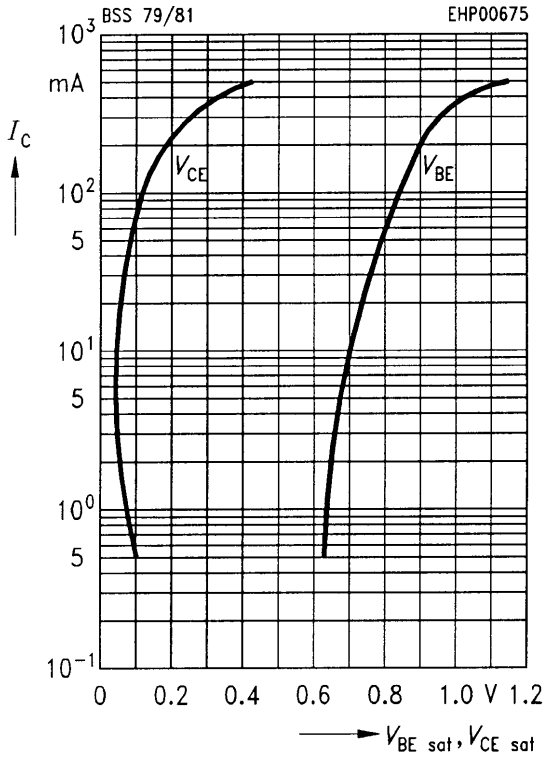


**Transition frequency  $f_T = f(I_C)$**

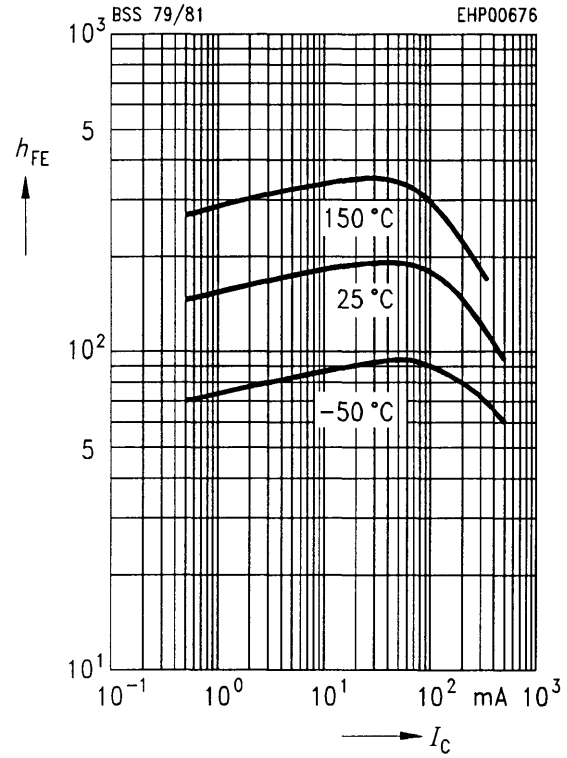
$V_{CE} = 20 \text{ V}$



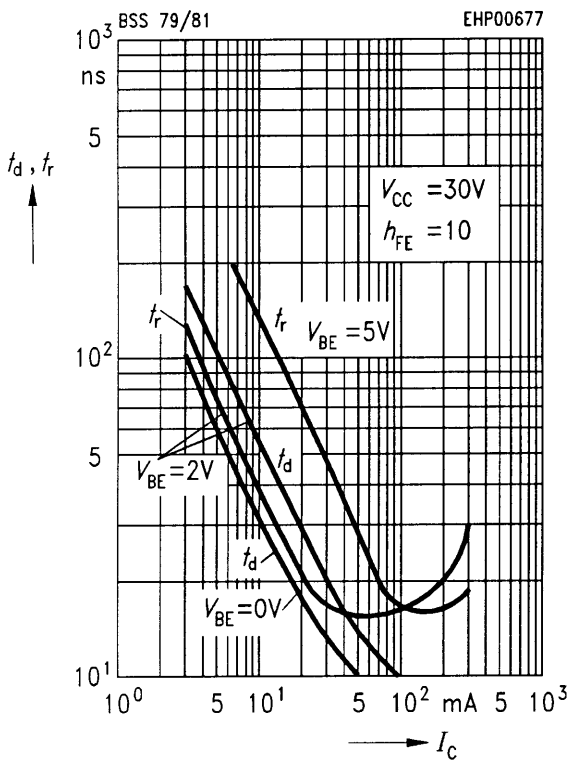
**Saturation voltage**  $I_C = f(V_{BE\ sat})$   
 $h_{FE} = 10$   $I_C = f(V_{CE\ sat})$



**DC current gain**  $h_{FE} = f(I_C)$   
 $V_{CE} = 10\ V$



**Delay time**  $t_d = f(I_C)$   
**Rise time**  $t_r = f(I_C)$



**Storage time**  $t_{stg} = f(I_C)$   
**Fall time**  $t_f = f(I_C)$

