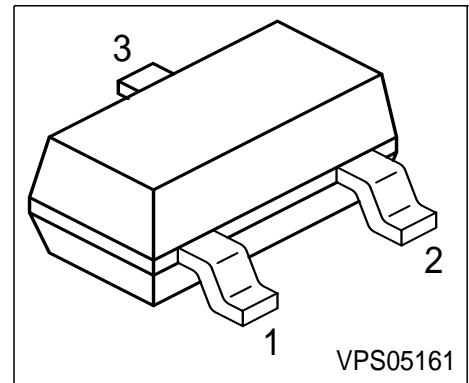


**NPN Silicon Switching Transistors**

- High DC current gain: 0.1mA to 500 mA
- Low collector-emitter saturation voltage
- Complementary types: BSS80, BSS82 (PNP)



Type	Marking	Pin Configuration			Package
BSS79B	CEs	1 = B	2 = E	3 = C	SOT23
BSS79C	CFs	1 = B	2 = E	3 = C	SOT23
BSS81B	CDs	1 = B	2 = E	3 = C	SOT23
BSS81C	CGs	1 = B	2 = E	3 = C	SOT23

**Maximum Ratings**

Parameter	Symbol	BSS79	BSS81	Unit
Collector-emitter voltage	$V_{CEO}$	40	35	V
Collector-base voltage	$V_{CBO}$	75		V
Emitter-base voltage	$V_{EBO}$	6		
DC 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	$T_{stg}$	-65 ... 150		

**Thermal Resistance**

Junction - soldering point <sup>1)</sup>	$R_{thJS}$	≤220	K/W
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<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 $I_C = 10\text{ mA}, I_B = 0$	$V_{(BR)CEO}$				V		
BSS79		40	-	-			
BSS81		35	-	-			
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	75	-	-			
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	6	-	-			
Collector cutoff current $V_{CB} = 60\text{ V}, I_E = 0$	$I_{CBO}$	-	-	10	nA		
Collector cutoff current $V_{CB} = 60\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$	$I_{CBO}$	-	-	10	$\mu\text{A}$		
Emitter cutoff current $V_{EB} = 3\text{ V}, I_C = 0$	$I_{EBO}$	-	-	10	nA		
DC current gain 1) $I_C = 100\text{ }\mu\text{A}, V_{CE} = 10\text{ V}$	$h_{FE}$	BSS79/81B	20	-	-	-	
		BSS79/81C	35	-	-		
$I_C = 1\text{ mA}, V_{CE} = 10\text{ V}$		BSS79/81B	25	-	-		
		BSS79/81C	50	-	-		
$I_C = 10\text{ mA}, V_{CE} = 10\text{ V}$		BSS79/81B	35	-	-		
		BSS79/81C	75	-	-		
$I_C = 150\text{ mA}, V_{CE} = 10\text{ V}$		BSS79/81B	40	-	120		
		BSS79/81C	100	-	300		
$I_C = 500\text{ mA}, V_{CE} = 10\text{ V}$		BSS79/81B	25	-	-		
		BSS79/82C	40	-	-		
Collector-emitter saturation voltage1) $I_C = 150\text{ mA}, I_B = 15\text{ mA}$		$V_{CEsat}$		-	-	0.3	V
$I_C = 500\text{ mA}, I_B = 50\text{ mA}$				-	-	1.3	
Base-emitter saturation voltage 1) $I_C = 150\text{ mA}, I_B = 15\text{ mA}$		$V_{BEsat}$		-	-	1.2	
$I_C = 500\text{ mA}, I_B = 50\text{ mA}$				-	-	2.0	

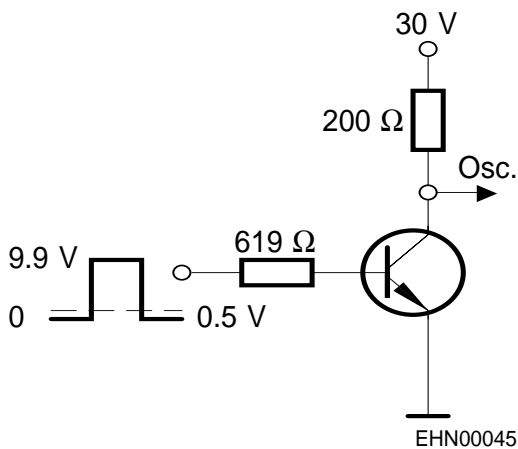
 1) Pulse test:  $t \leq 300\mu\text{s}$ ,  $D = 2\%$

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

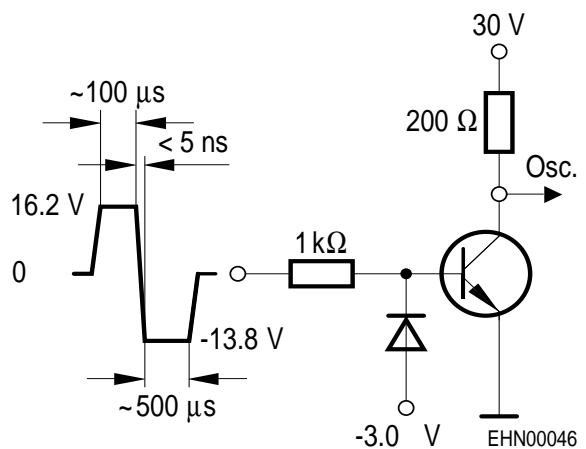
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Transition frequency $I_C = 20\text{ mA}$ , $V_{CE} = 20\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	-	250	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{cb}$	-	6	-	pF
Delay time $V_{CC} = 30\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = 15\text{ mA}$ , $V_{BE(off)} = 0.5\text{ V}$	$t_d$	-	-	10	ns
Rise time $V_{CC} = 30\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = 15\text{ mA}$ , $V_{BE(off)} = 0.5\text{ V}$	$t_r$	-	-	25	
Storage time $V_{CC} = 30\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = I_{B2} = 15\text{ mA}$	$t_{stg}$	-	-	250	
Fall time $V_{CC} = 30\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = I_{B2} = 15\text{ mA}$	$t_f$	-	-	60	

### Test circuits

#### Delay and rise time

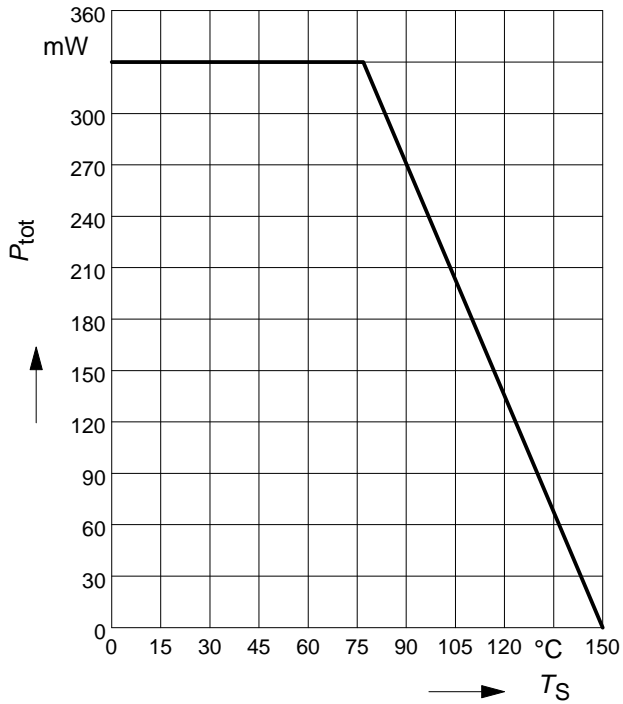


#### Storage and fall time



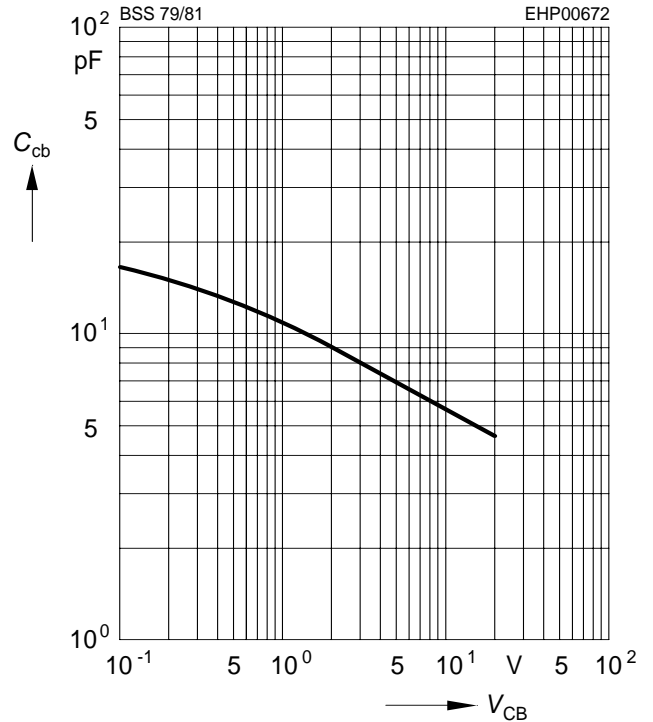
Oscilloscope:  $R > 100\text{ k}\Omega$   
 $C < 12\text{ pF}$   
 $t_f < 5\text{ ns}$

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



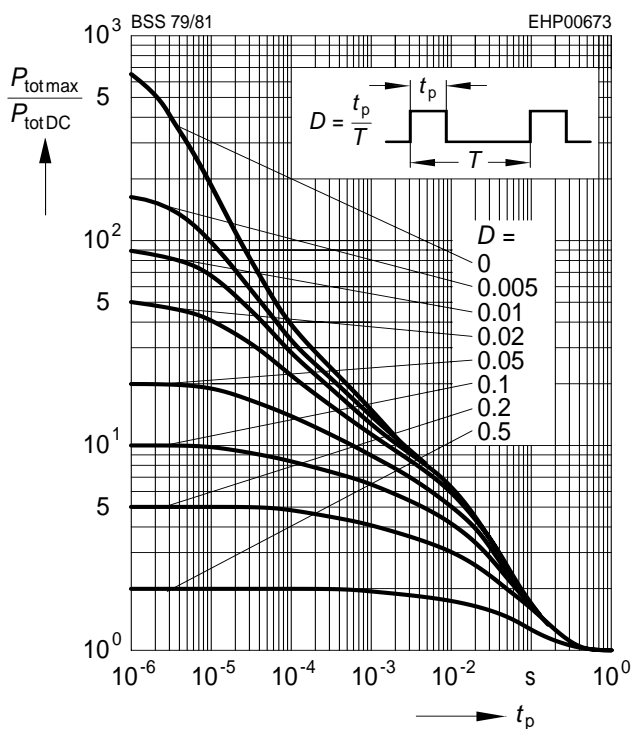
**Collector-base capacitance  $C_{CB} = f(V_{CB})$**

$f = 1\text{MHz}$



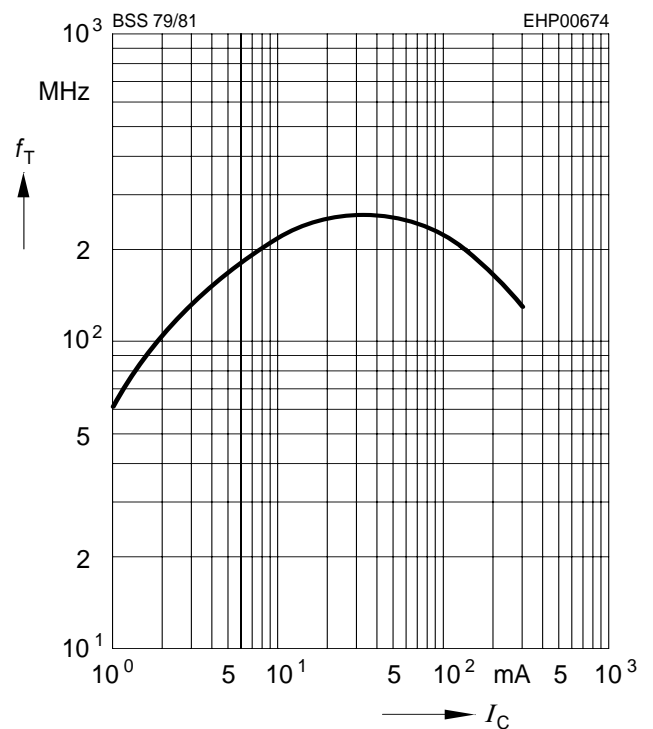
**Permissible pulse load**

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



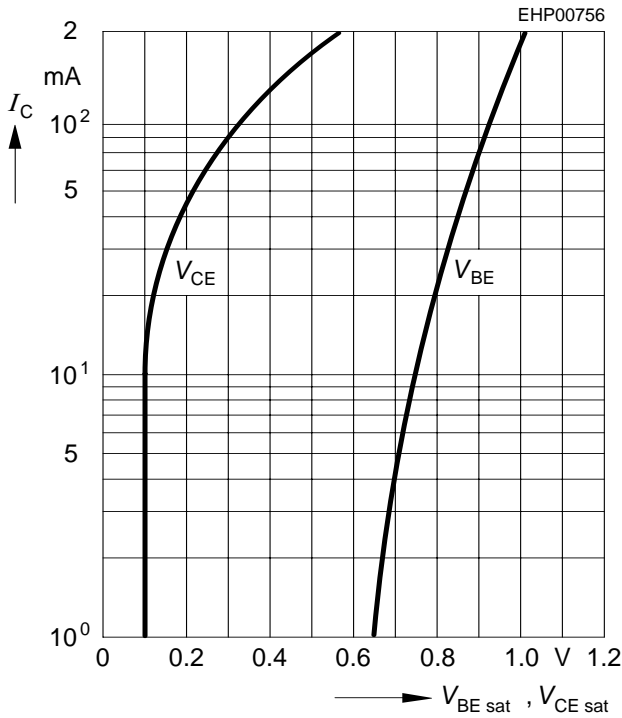
**Transition frequency  $f_T = f(I_C)$**

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



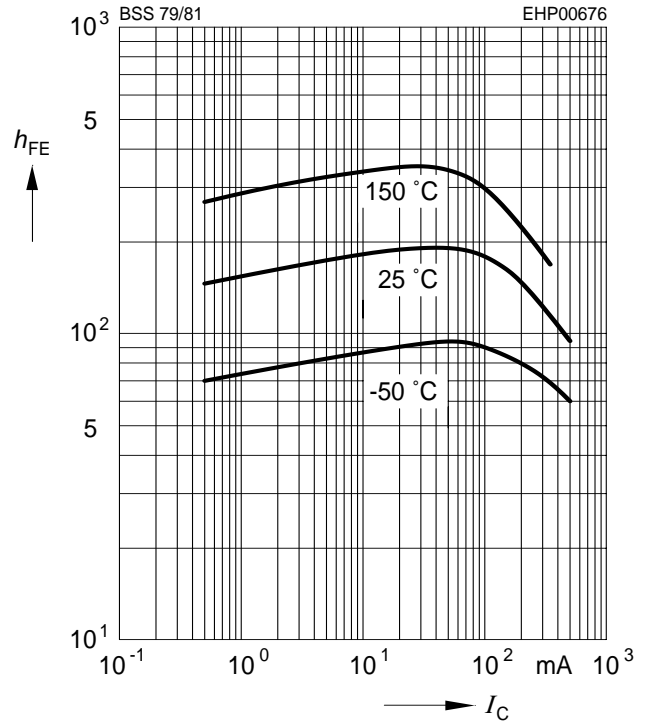
Saturation voltage  $I_C = f(V_{BEsat}, V_{CEsat})$

$h_{FE} = 10$



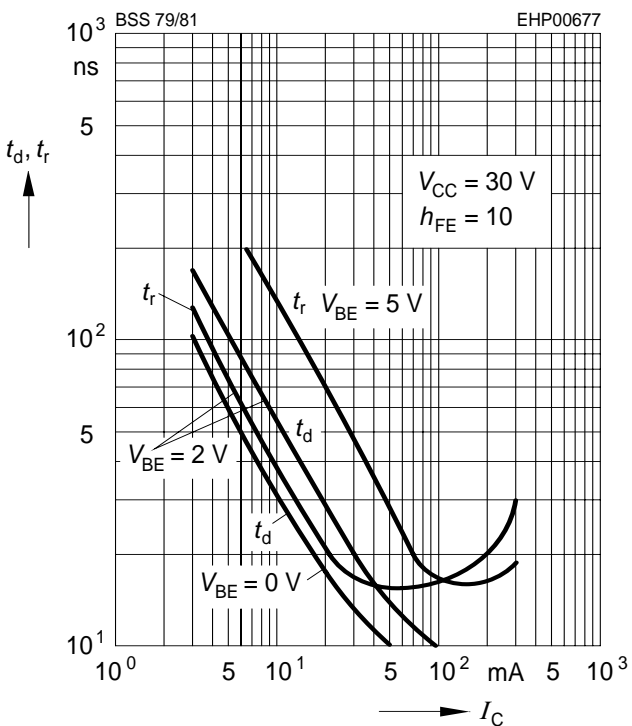
DC current gain  $h_{FE} = f(I_C)$

$V_{CE} = 10V$



Delay time  $t_d = f(I_C)$

Rise time  $t_r = f(I_C)$



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

Fall time  $t_f = f(I_C)$

