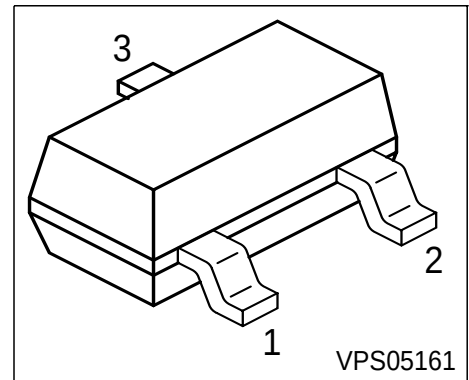


NPN Silicon Switching Transistors

- 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, $T_S = 77\text{ }^{\circ}\text{C}$	P_{tot}	330		mW
Junction temperature	T_j	150		$^{\circ}\text{C}$
Storage temperature	T_{stg}	-65 ... 150		

Thermal Resistance

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

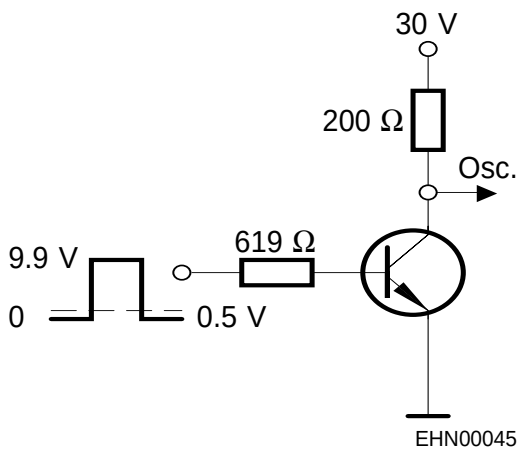
1) Pulse test: $t \leq 300\mu\text{s}$, $D = 2\%$

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

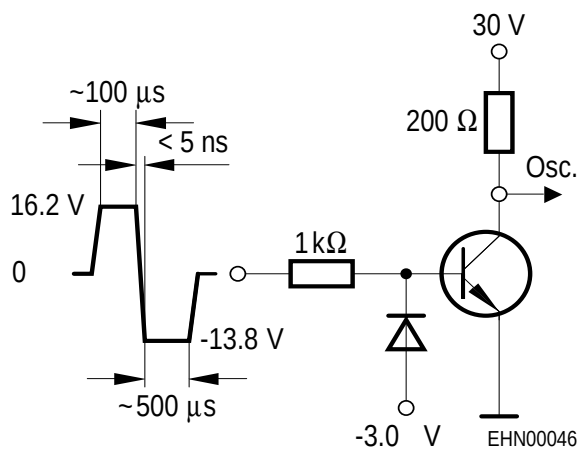
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency $I_C = 20\text{ mA}$, $V_{CE} = 20\text{ V}$, $f = 100\text{ MHz}$	f_T	-	250	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{cb}	-	6	-	pF
Delay time $V_{CC} = 30\text{ V}$, $I_C = 150\text{ mA}$, $I_{B1} = 15\text{ mA}$, $V_{BE(off)} = 0.5\text{ V}$	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

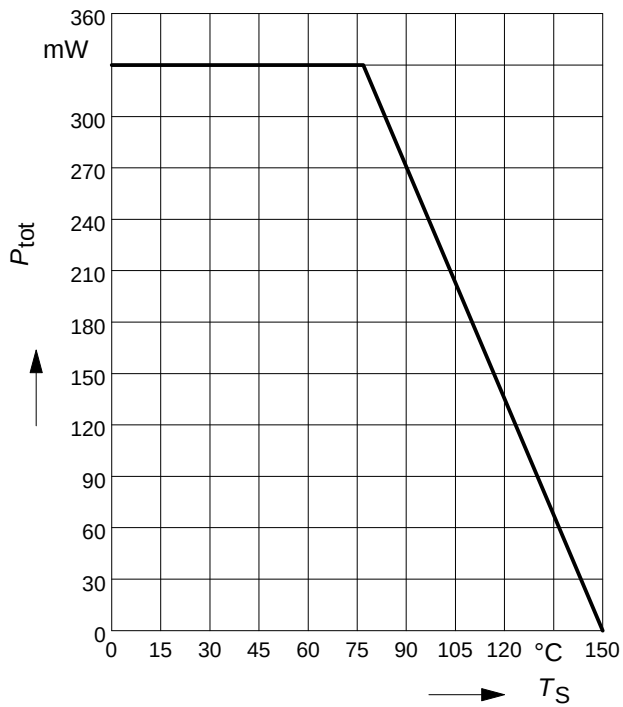


Storage and fall time

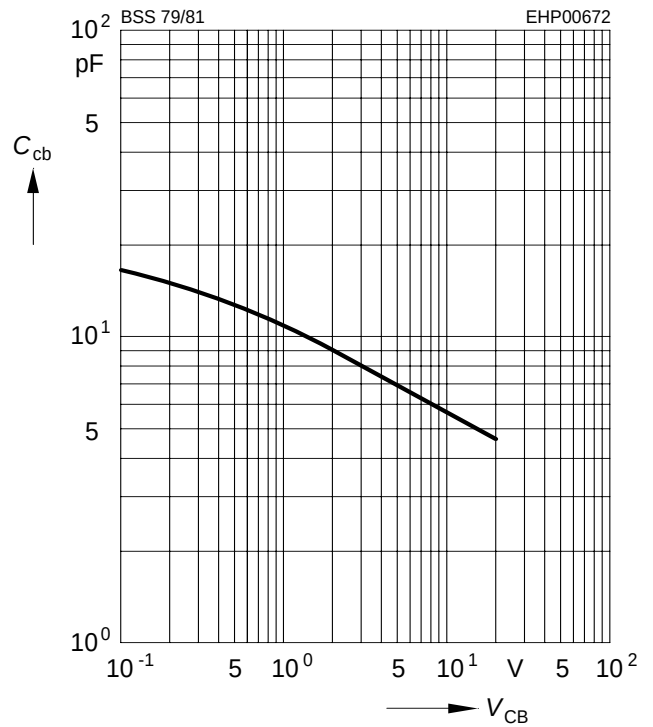


Oscillograph: $R > 100\text{ k}\Omega$
 $C < 12\text{ pF}$
 $t_r < 5\text{ ns}$

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

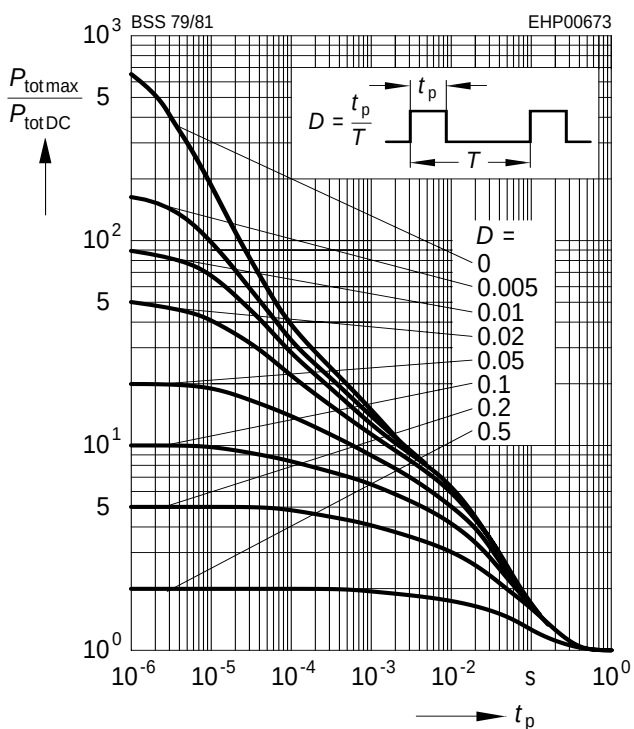


Collector-base capacitance $C_{\text{CB}} = f(V_{\text{CB}})$
 $f = 1\text{MHz}$



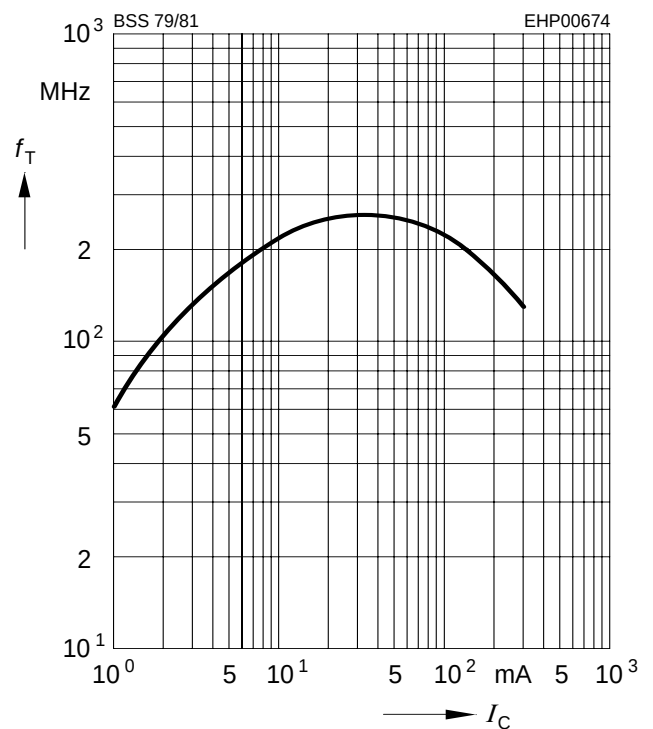
Permissible pulse load

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



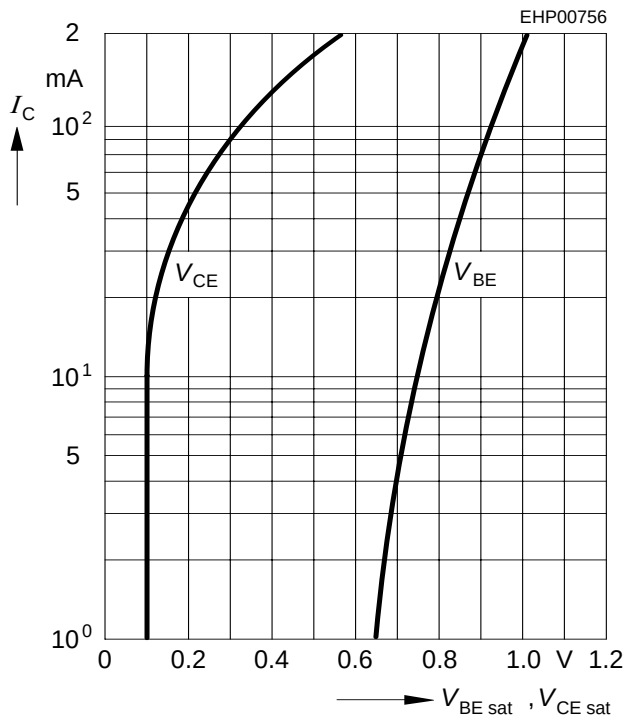
Transition frequency $f_T = f(I_C)$

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



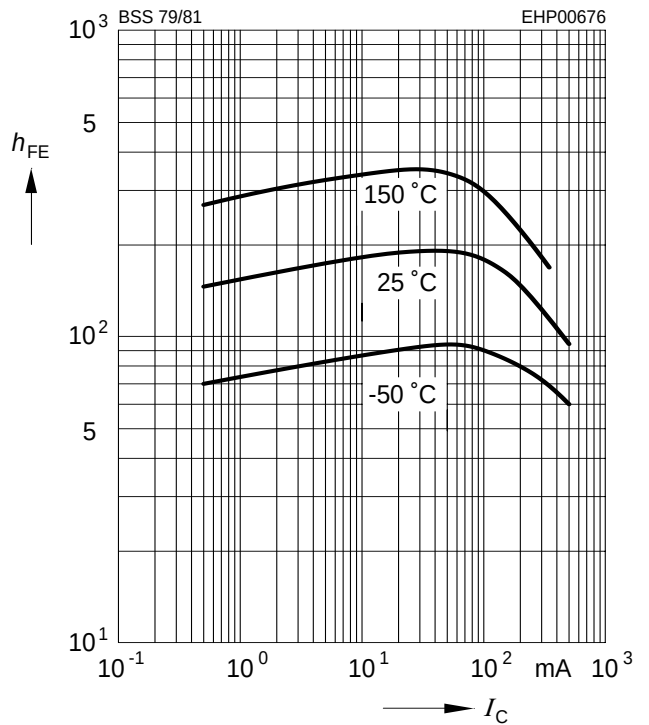
Saturation voltage $I_C = f(V_{BEsat}, V_{CEsat})$

$h_{FE} = 10$



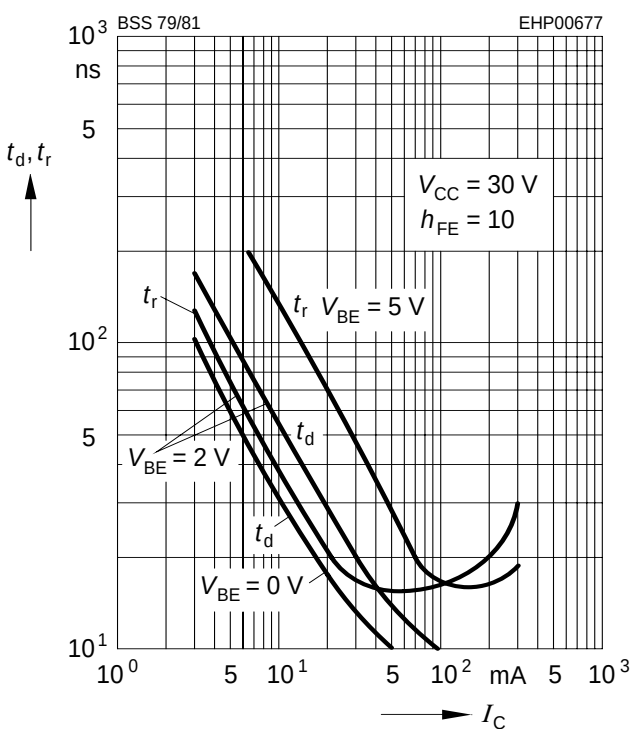
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 10V$



Delay time $t_d = f(I_C)$

Rise time $t_r = f(I_C)$



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

Fall time $t_f = f(I_C)$

