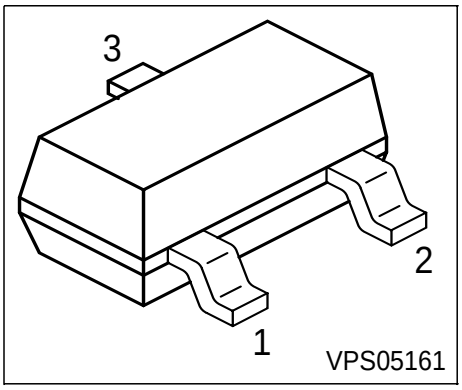
NPN Silicon Switching Transistors

- 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 °C	P_{tot}	330		mW
Junction temperature	T_j	150		°C
Storage temperature	T_{stg}	-65 ... 150		

Thermal Resistance

Junction - soldering point[1)]	R_{thJS}	≤220	K/W

[1]For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at T_A = 25°C, unless otherwise specified.

Parameter		Symbol	Values			Unit
			min.	typ.	max.	
DC Characteristics						
Collector-emitter breakdown voltage		$V_{(BR)CEO}$				V
I_C = 10 mA, I_B = 0	BSS79		40	-	-	
	BSS81		35	-	-	
Collector-base breakdown voltage		$V_{(BR)CBO}$	75	-	-	
I_C = 10 µA, I_E = 0						
Emitter-base breakdown voltage		$V_{(BR)EBO}$	6	-	-	
I_E = 10 µA, I_C = 0						
Collector cutoff current		I_{CBO}	-	-	10	nA
V_{CB} = 60 V, I_E = 0						
Collector cutoff current		I_{CBO}	-	-	10	µA
V_{CB} = 60 V, I_E = 0 , T_A = 150 °C						
Emitter cutoff current		I_{EBO}	-	-	10	nA
V_{EB} = 3 V, I_C = 0						
DC current gain 1)		h_{FE}				-
I_C = 100 µA, V_{CE} = 10 V	BSS79/81B		20	-	-	
	BSS79/81C		35	-	-	
I_C = 1 mA, V_{CE} = 10 V	BSS79/81B		25	-	-	
	BSS79/81C		50	-	-	
I_C = 10 mA, V_{CE} = 10 V	BSS79/81B		35	-	-	
	BSS79/81C		75	-	-	
I_C = 150 mA, V_{CE} = 10 V	BSS79/81B		40	-	120	
	BSS79/81C		100	-	300	
I_C = 500 mA, V_{CE} = 10 V	BSS79/81B		25	-	-	
	BSS79/82C		40	-	-	
Collector-emitter saturation voltage1)		V_{CEsat}				V
I_C = 150 mA, I_B = 15 mA			-	-	0.3	
I_C = 500 mA, I_B = 50 mA			-	-	1.3	
Base-emitter saturation voltage 1)		V_{BEsat}				
I_C = 150 mA, I_B = 15 mA			-	-	1.2	
I_C = 500 mA, I_B = 50 mA			-	-	2.0	

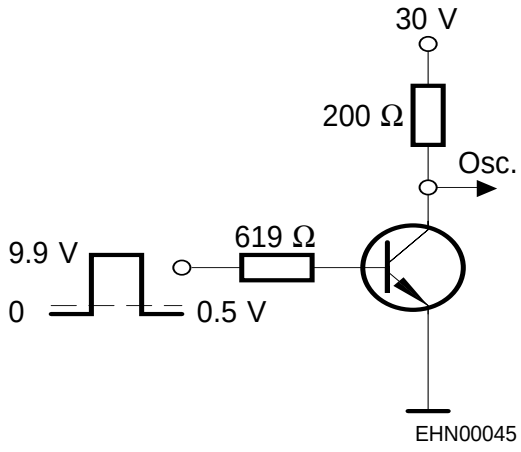
1) Pulse test: t ≤ 300µs, D = 2%

Electrical Characteristics at T_A = 25°C, unless otherwise specified.

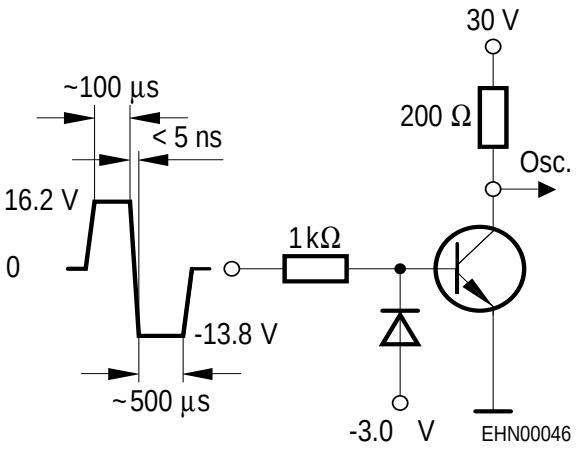
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency I_C = 20 mA, V_{CE} = 20 V, f = 100 MHz	f_T	-	250	-	MHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	6	-	pF
Delay time V_{CC} = 30 V, I_C = 150 mA, I_{B1} = 15 mA, $V_{BE(off)}$ = 0.5 V	t_d	-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

Test circuits

Delay and rise time

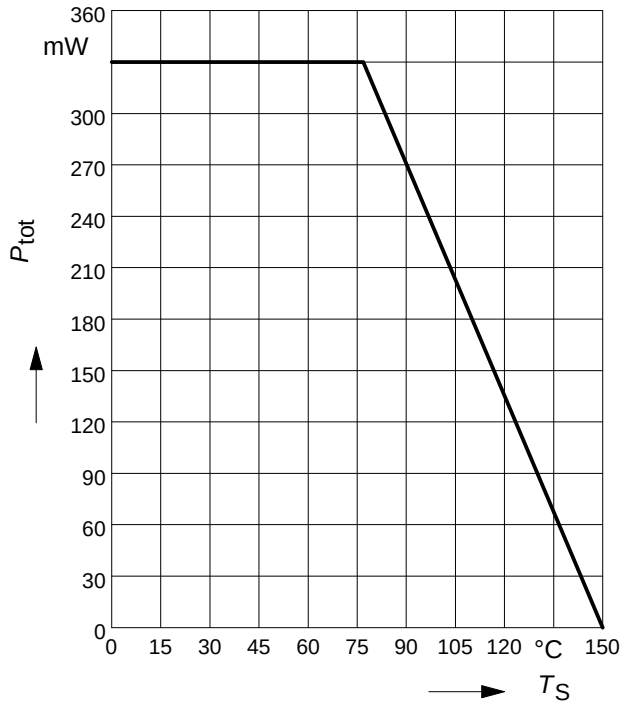


Storage and fall time



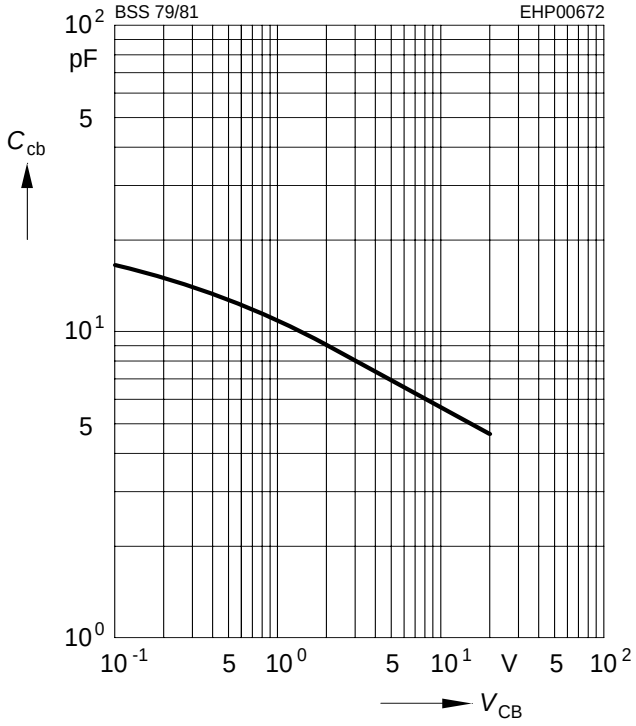
Oscillograph: R > 100kΩ
C < 12pF
t_r < 5ns

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



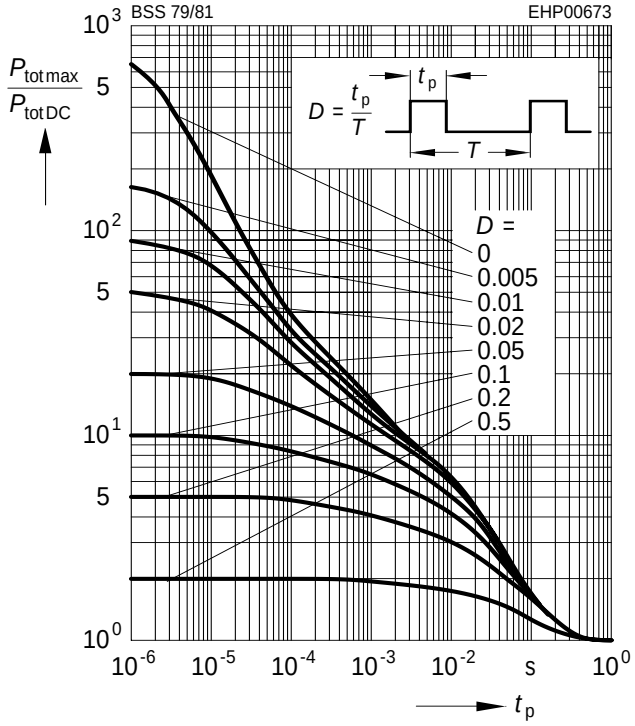
Collector-base capacitance $C_{CB} = f(V_{CB})$

f = 1MHz



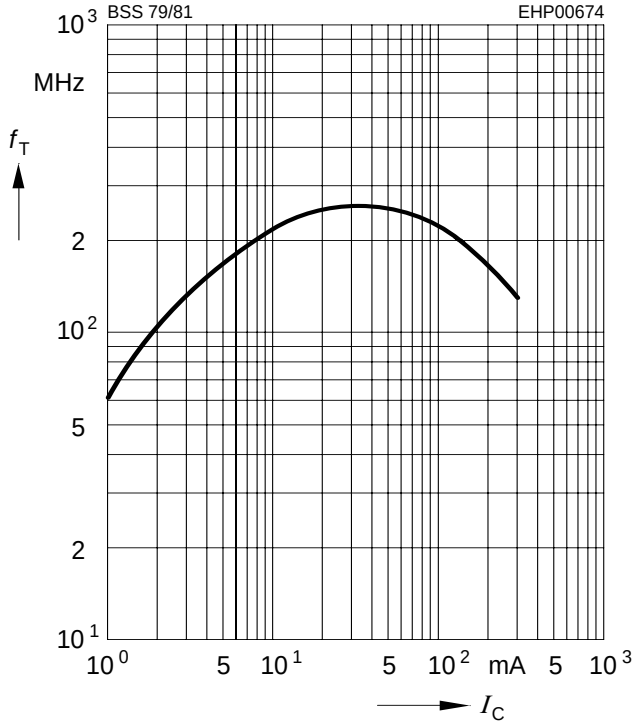
Permissible pulse load

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

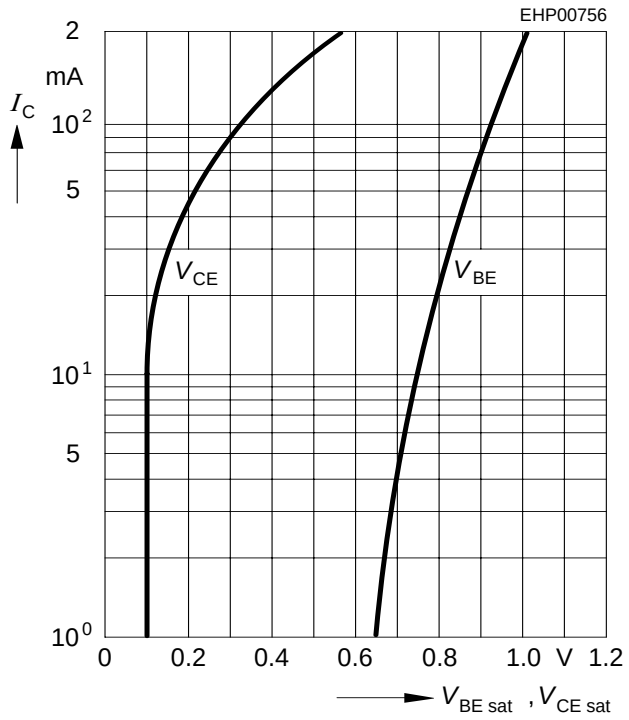


Transition frequency $f_T = f(I_C)$

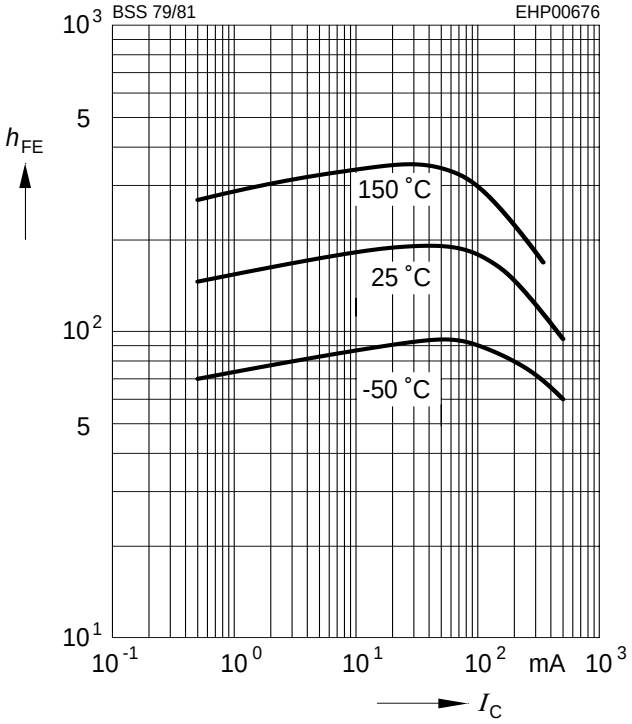
V_{CE} = 20V



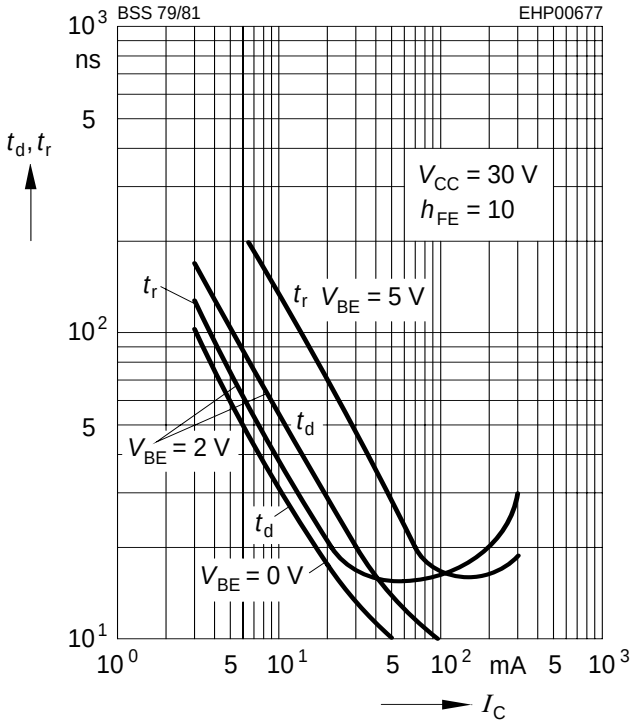
Saturation voltage $I_C = f(V_{BEsat}, V_{CEsat})$
$h_{FE} = 10$



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 $t_f = f(I_C)$