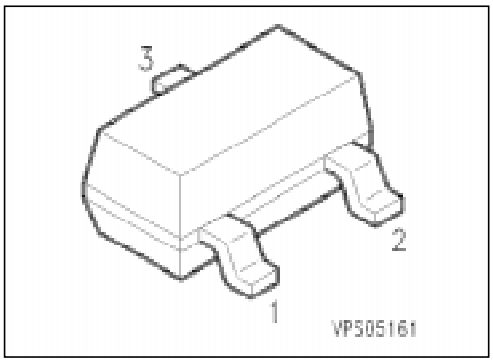
SIEMENS

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 1	2	3	Package[1]
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 BSS 79	BSS 81	Unit
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, $T_S = 77$ °C	P_{tot}	330		mW
Junction temperature	T_j	150		°C
Storage temperature range	T_{stg}	– 65 … + 150		

Thermal Resistance

Junction - ambient[2]	$R_{th\ JA}$	≤ 290	K/W
Junction - soldering point	$R_{th\ JS}$	≤ 220	

1) For detailed information see chapter Package Outlines.
2) Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm² Cu.

Electrical Characteristics

at T_A = 25 °C, unless otherwise specified.

Parameter		Symbol	Values			Unit
			min.	typ.	max.	
DC characteristics						
Collector-emitter breakdown voltage		$V_{(BR)CE0}$				V
I_C = 10 mA	BSS 79		40	–	–	
	BSS 81		35	–	–	
Collector-base breakdown voltage		$V_{(BR)CB0}$	75	–	–	
I_C = 10 µA						
Emitter-base breakdown voltage		$V_{(BR)EB0}$	6	–	–	
I_E = 10 µA						
Collector-base cutoff current		I_{CB0}				
V_{CB} = 60 V			–	–	10	nA
V_{CB} = 60 V, T_A = 150 °C			–	–	10	µA
Emitter-base cutoff current		I_{EB0}	–	–	10	nA
V_{EB} = 3 V						
DC current gain		h_{FE}				–
I_C = 100 µA, V_{CE} = 10 V	BSS 79 B/81 B		20	–	–	
	BSS 79 C/81 C		35	–	–	
I_C = 1 mA, V_{CE} = 10 V	BSS 79 B/81 B		25	–	–	
	BSS 79 C/81 C		50	–	–	
I_C = 10 mA, V_{CE} = 10 V[1)]	BSS 79 B/81 B		35	–	–	
	BSS 79 C/81 C		75	–	–	
I_C = 150 mA, V_{CE} = 10 V[1)]	BSS 79 B/81 B		40	–	120	
	BSS 79 C/81 C		100	–	300	
I_C = 500 mA, V_{CE} = 10 V[1)]	BSS 79 B/81 B		25	–	–	
	BSS 79 C/81 C		40	–	–	
Collector-emitter saturation voltage[1)]		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	

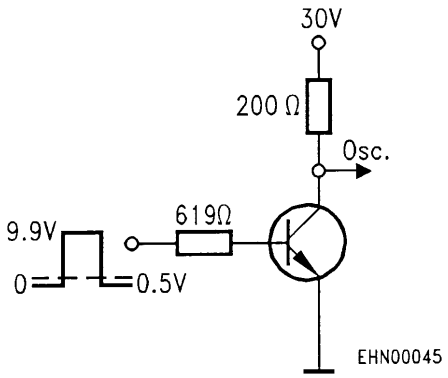
1) Pulse test conditions: $t \leq 300$ µs, D = 2 %.

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

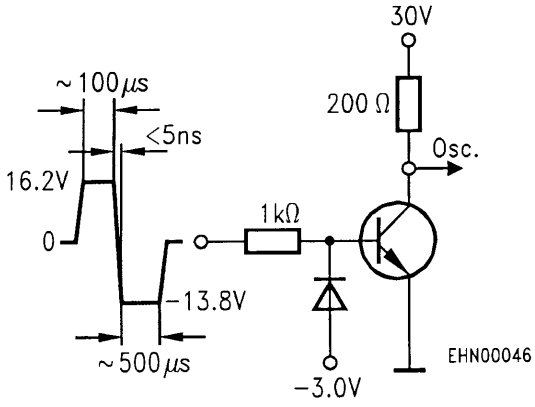
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC characteristics					
Transition frequency I_C = 20 mA, V_{CE} = 20 V, f = 100 MHz	f_t	–	250	–	MHz
Open-circuit output capacitance V_{CB} = 10 V, f = 1 MHz	C_{obo}	–	6	–	pF
V_{CC} = 30 V, I_C = 150 mA, I_{B1} = I_{B2} = 15 mA, V_{BE} = 0.5 V					
Delay 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

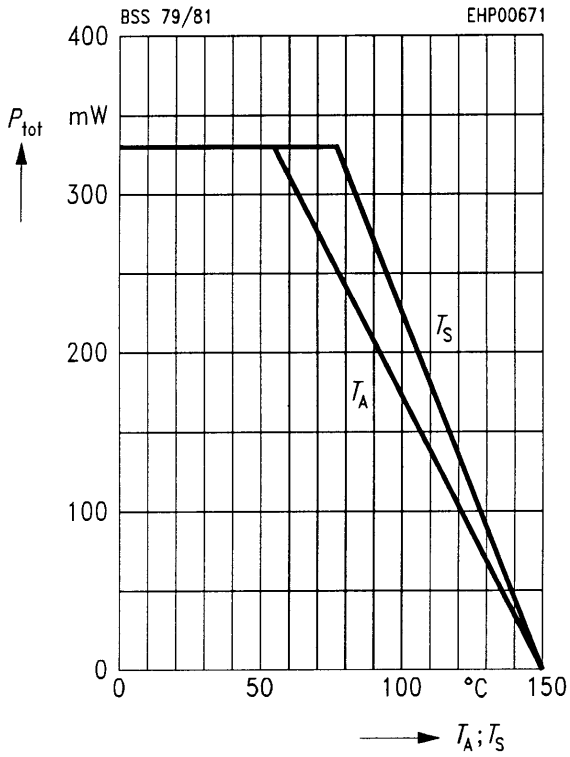


Storage and fall time

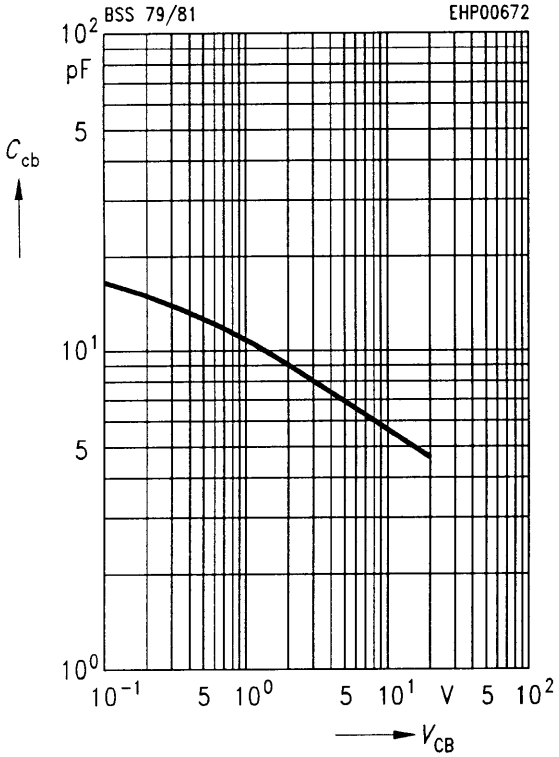


Oscillograph: R > 100 kΩ
C < 12 pF
t_r < 5 ns

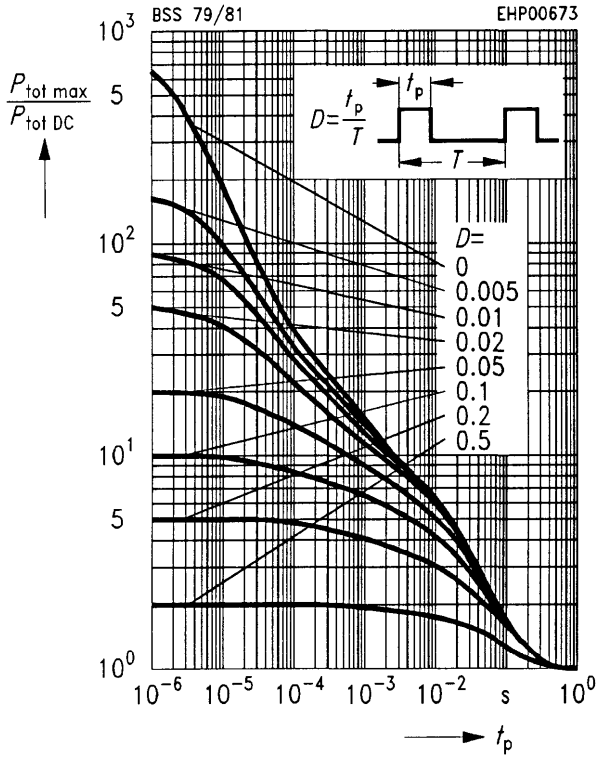
Total power dissipation $P_{tot} = f(T_A^*; T_S)$
* Package mounted on epoxy



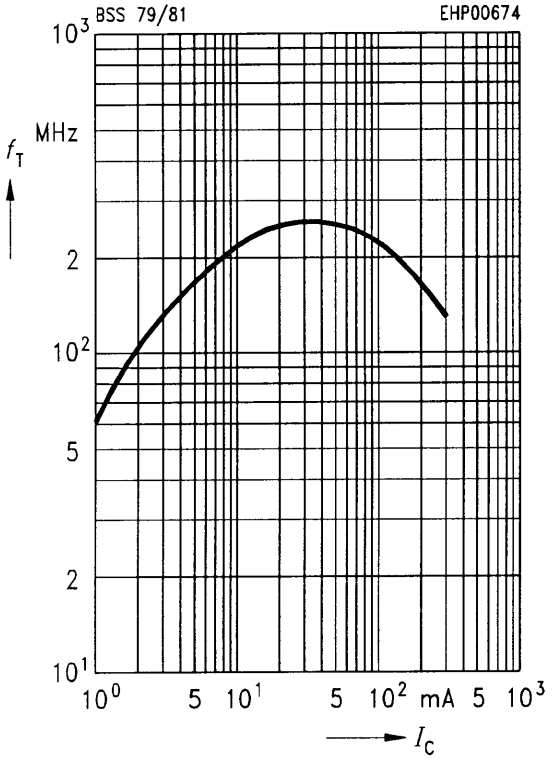
Collector-base capacitance $C_{cb} = f(V_{CB})$
f = 1 MHz



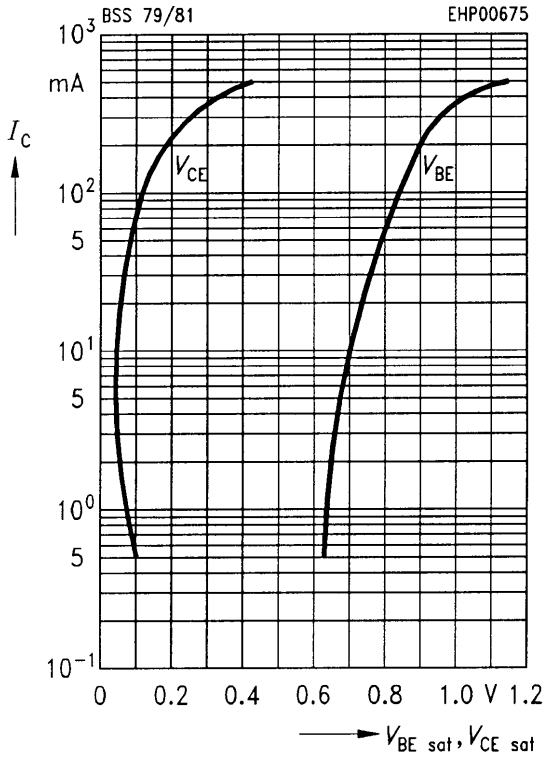
Permissible pulse load $P_{tot\,max}/P_{tot\,DC} = f(t_p)$



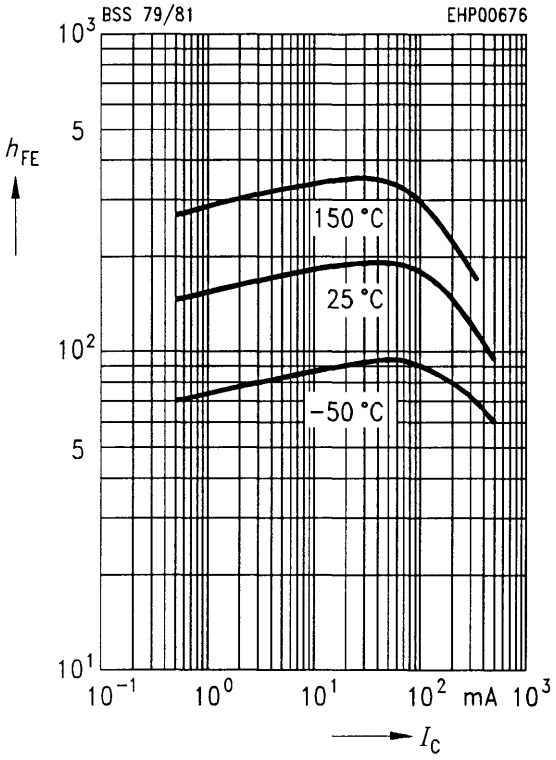
Transition frequency $f_T = f(I_C)$
V_{CE} = 20 V



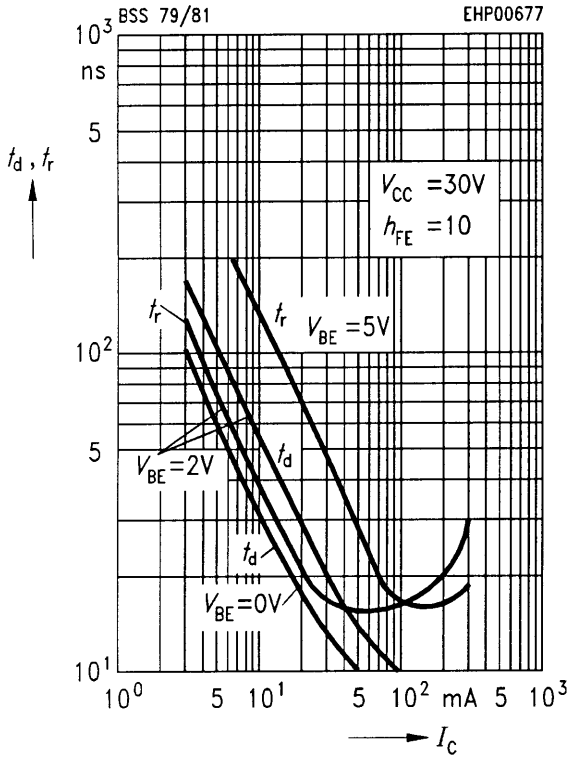
Saturation voltage $I_C = f(V_{BE\,sat})$
$h_{FE} = 10$ $I_C = f(V_{CE\,sat})$



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 $t_f = f(I_C)$