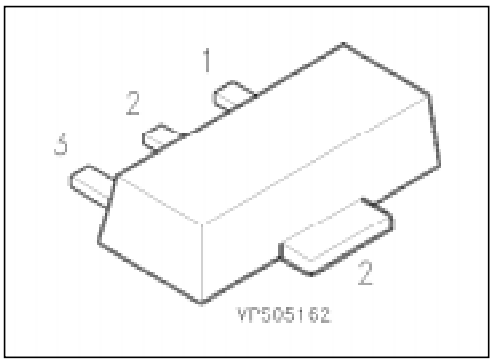
SIEMENS

NPN Silicon Switching Transistor — SXT 2222 A

- High current gain: 0.1 mA to 500 mA
- Low collector-emitter saturation voltage



Type	Marking	Ordering Code (tape and reel)	Pin Configuration 1	2	3	Package[1]
SXT 2222 A	2P	Q68000-A8330	B	C	E	SOT-89

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE0}	40	V
Collector-base voltage	V_{CB0}	75	
Emitter-base voltage	V_{EB0}	6	
Collector current	I_C	600	mA
Total power dissipation, T_S = 120 °C	P_{tot}	1	W
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	– 65 … + 150	

Thermal Resistance

Junction - ambient[2]	$R_{th\ JA}$	≤ 90	K/W
Junction - soldering point	$R_{th\ JS}$	≤ 30	

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 I_C = 10 mA	$V_{(BR)CE0}$	40	–	–	V
Collector-base breakdown voltage I_C = 10 µA	$V_{(BR)CB0}$	75	–	–	
Emitter-base breakdown voltage I_E = 10 µA	$V_{(BR)EB0}$	6	–	–	
Collector-base cutoff current V_{CB} = 60 V, I_E = 0 V_{CB} = 60 V, I_E = 0, T_A = 125 ˚C	I_{CB0}	 – –	 – –	 10 10	 nA µA
Collector cutoff current V_{CE} = 30 V, V_{BE} = 0.5 V	I_{CEX}	–	–	10	nA
Emitter-base cutoff current V_{EB} = 3 V, I_C = 0	I_{EB0}	–	–	10	
Base cutoff current V_{CE} = 30 V, V_{BE} = – 3 V	I_{BL}	–	–	20	
DC current gain I_C = 100 µA, V_{CE} = 10 V I_C = 1 mA, V_{CE} = 10 V I_C = 10 mA, V_{CE} = 10 V I_C = 10 mA, V_{CE} = 10 V, T_A = – 55 ˚C I_C = 150 mA, V_{CE} = 10 V I_C = 150 mA, V_{CE} = 1 V I_C = 500 mA, V_{CE} = 10 V	h_{FE}	 35 50 75 35 100 50 40	 – – – – – – –	 – – – – 300 – –	–
Collector-emitter saturation voltage[1)] I_C = 150 mA, I_B = 15 mA I_C = 500 mA, I_B = 50 mA	V_{CEsat}	 – –	 – –	 0.3 1.0	V
Base-emitter saturation voltage[1)] I_C = 150 mA, I_B = 15 mA I_C = 500 mA, I_B = 50 mA	V_{BEsat}	 0.6 –	 – –	 1.2 2.0	

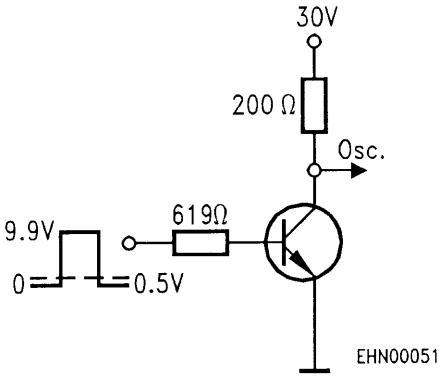
1) Pulse test conditions: $t \leq 300$ µs, $D \leq 2$ %.

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

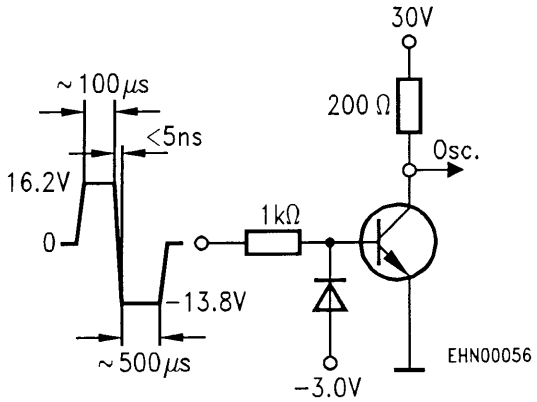
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC characteristics					
Transition frequency I_C = 50 mA, V_{CE} = 20 V, f = 100 MHz	f_T	300	–	–	MHz
Output capacitance V_{CB} = 10 V, f = 1 MHz	C_{obo}	–	–	8	pF
Input capacitance V_{EB} = 2 V, f = 1 MHz	C_{ibo}	–	–	25	
Input impedance I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz I_C = 10 mA, V_{CE} = 10 V, f = 1 kHz	h_{ie}	 2 0.25	 – –	 8 1.25	kΩ
Voltage feedback ratio I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz I_C = 10 mA, V_{CE} = 10 V, f = 1 kHz	h_{re}	 – –	 – –	 8 4	10^{-4}
Small-signal current gain I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz I_C = 10 mA, V_{CE} = 10 V, f = 1 kHz	h_{fe}	 50 75	 – –	 300 375	–
Output admittance I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz I_C = 10 mA, V_{CE} = 10 V, f = 1 kHz	h_{oe}	 5 25	 – –	 35 200	µS
Collector-base time constant I_E = 20 mA, V_{CB} = 20 V, f = 31.8 MHz	$r_b'C_c$	–	–	150	ps
Noise figure I_C = 100 µA, V_{CE} = 10 V, R_S = 1 kΩ, f = 1 kHz	NF	–	–	4	dB
Switching times V_{CC} = 30 V, V_{BE} = 0.5 V, I_C = 150 mA, I_{B1} = 15 mA V_{CC} = 30 V, I_C = 150 mA, I_{B1} = I_{B2} = 15 mA	 t_d t_r t_s t_f	 – – – –	 – – – –	 10 25 225 60	 ns ns ns ns

Test circuits

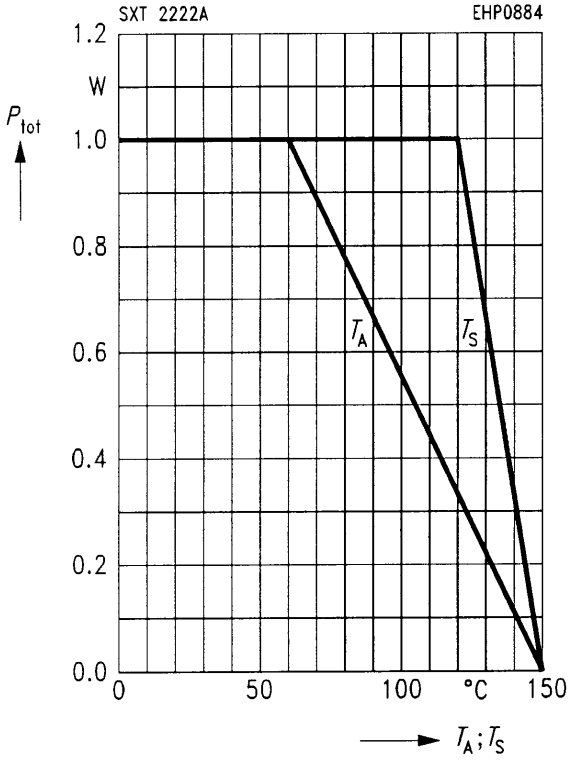
Delay and rise time



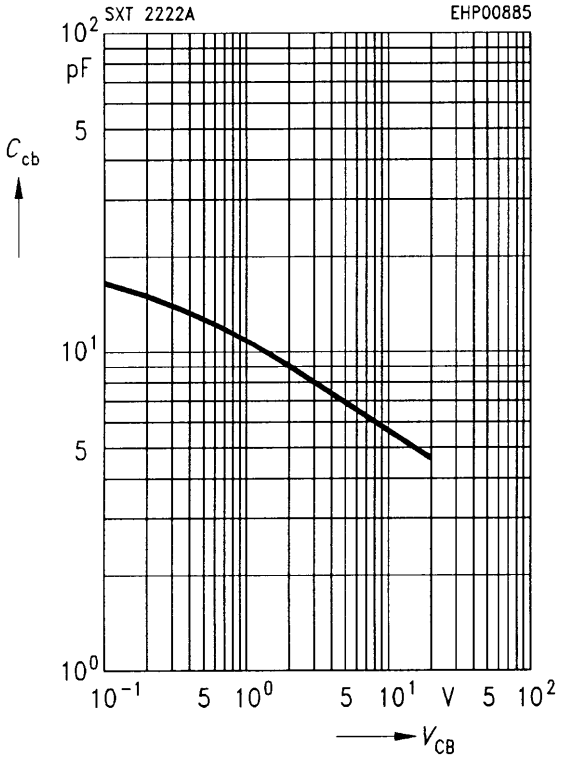
Storage and fall time



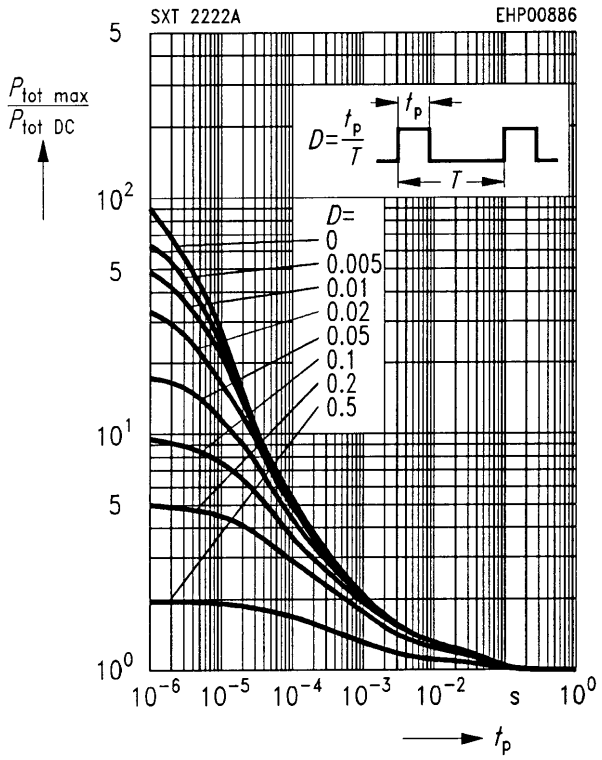
Total power dissipation $P_{tot} = f(T_A^*; T_S)$
* Package mounted on epoxy



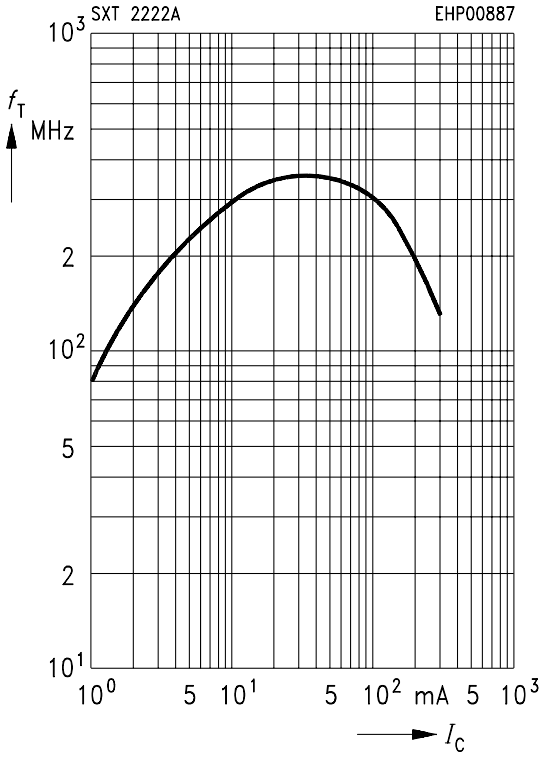
Collector-base capacitance
$C_{cb} = f(V_{CB})$
f = 1 MHz



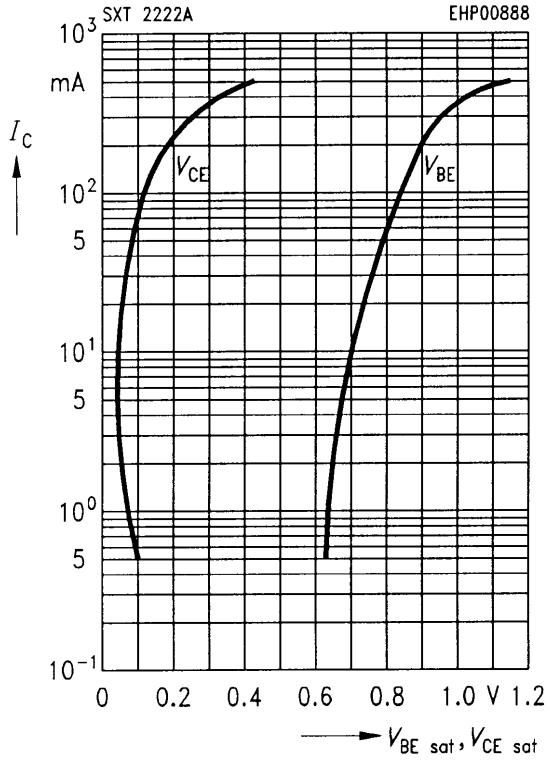
Permissible pulse load $P_{tot\,max} / P_{tot\,DC} = f(t_p)$



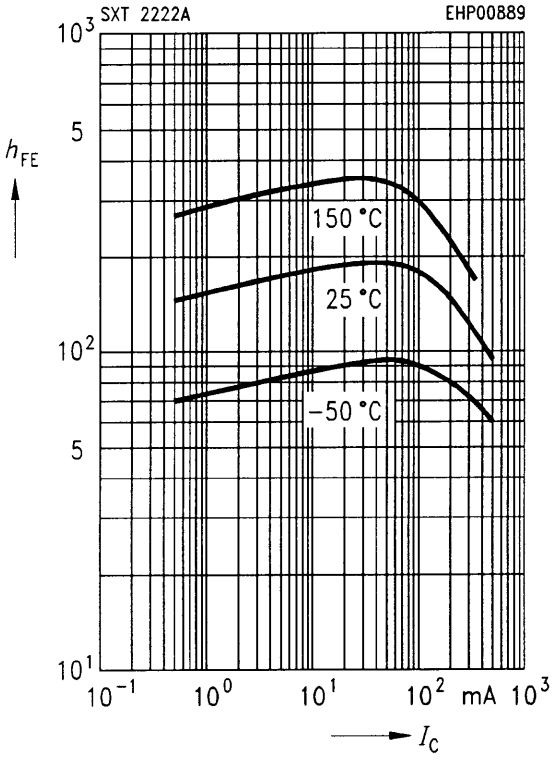
Transition frequency $f_T = f(I_C)$
V_{CE} = 20 V



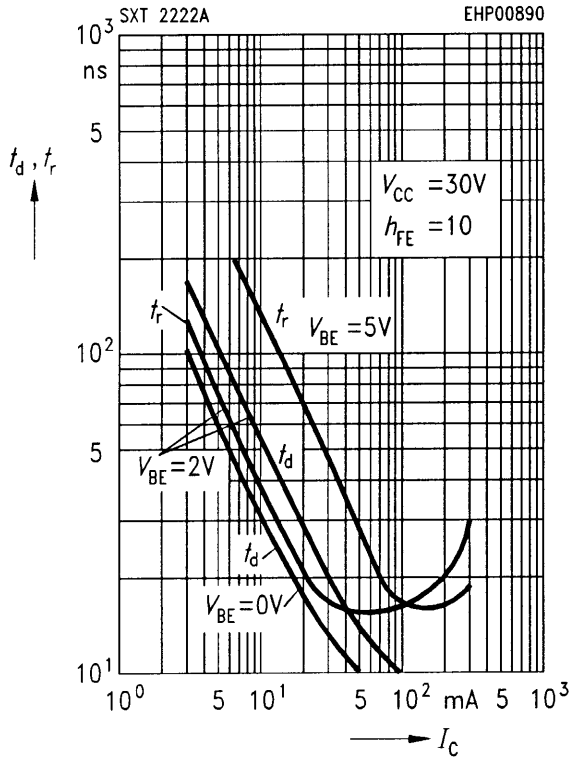
Saturation voltage $I_C = f(V_{BE\,sat}, V_{CE\,sat})$
$h_{FE} = 10$



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 $t_s = f(I_C)$
Fall time $t_f = f(I_C)$