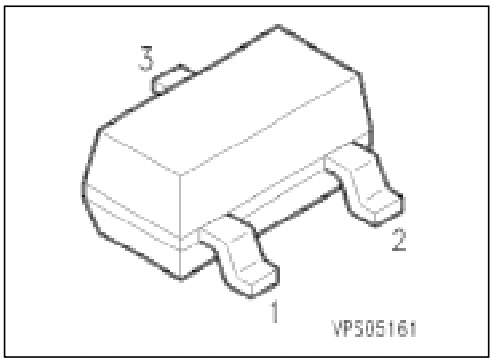
SIEMENS

PNP Silicon Transistors for High Voltages

SMBTA 92
SMBTA 93

- High breakdown voltage
- Low collector-emitter saturation voltage
- Complementary types: SMBTA 42, SMBTA 43 (NPN)



Type	Marking	Ordering Code (tape and reel)	Pin Configuration 1	2	3	Package[1]
SMBTA 92 SMBTA 93	s2D s2E	Q68000-A6479 Q68000-A6483	B	E	C	SOT-23

Maximum Ratings

Parameter	Symbol	Values SMBTA 92	SMBTA 93	Unit
Collector-emitter voltage	V_{CE0}	300	200	V
Collector-base voltage	V_{CB0}	300	200	
Emitter-base voltage	V_{EB0}	5		
Collector current	I_C	500		mA
Base current	I_B	100		
Total power dissipation, T_S = 74 ˚C	P_{tot}	360		mW
Junction temperature	T_j	150		˚C
Storage temperature range	T_{stg}	– 65 … + 150		

Thermal Resistance

Junction - ambient[2]	$R_{th\ JA}$	≤ 280	K/W
Junction - soldering point	$R_{th\ JS}$	≤ 210	

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

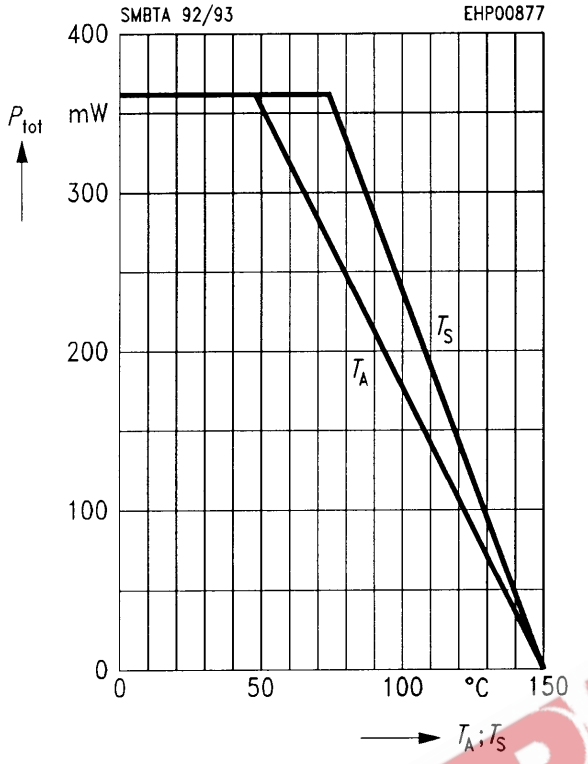
Electrical Characteristics

at T_A = 25 °C, unless otherwise specified.

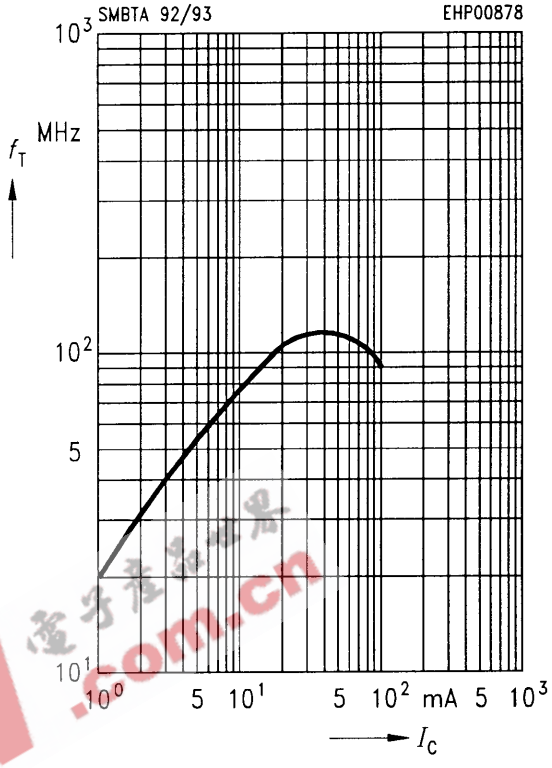
Parameter		Symbol	Values			Unit
			min.	typ.	max.	
DC characteristics						
Collector-emitter breakdown voltage		$V_{(BR)CE0}$				V
I_C = 1 mA	SMBTA 92		300	–	–	
	SMBTA 93		200	–	–	
Collector-base breakdown voltage		$V_{(BR)CB0}$				
I_C = 100 µA	SMBTA 92		300	–	–	
	SMBTA 93		200	–	–	
Emitter-base breakdown voltage		$V_{(BR)EB0}$	5	–	–	
I_E = 100 µA						
Collector-base cutoff current		I_{CB0}				
V_{CB} = 200 V	SMBTA 92		–	–	250	nA
V_{CB} = 160 V	SMBTA 93		–	–	250	nA
V_{CB} = 200 V, T_A = 150 °C	SMBTA 92		–	–	20	µA
V_{CB} = 160 V, T_A = 150 °C	SMBTA 93		–	–	20	µA
Emitter-base cutoff current		I_{EB0}	–	–	100	nA
V_{EB} = 3 V						
DC current gain		h_{FE}				–
I_C = 1 mA, V_{CE} = 10 V			25	–	–	
I_C = 10 mA, V_{CE} = 10 V[1)]			40	–	–	
I_C = 30 mA, V_{CE} = 10 V[1)]	SMBTA 92		25	–	–	
	SMBTA 93		25	–	–	
Collector-emitter saturation voltage[1)]		V_{CEsat}				V
I_C = 20 mA, I_B = 2 mA	SMBTA 92		–	–	0.5	
	SMBTA 93		–	–	0.4	
Base-emitter saturation voltage[1)]		V_{BEsat}	–	–	0.9	
I_C = 20 mA, I_B = 2 mA						
AC characteristics						
Transition frequency		f_t	50	–	–	MHz
I_C = 10 mA, V_{CE} = 20 V, f = 100 MHz						
Output capacitance		C_{obo}				pF
V_{CB} = 20 V, f = 1 MHz	SMBTA 92		–	–	6	
	SMBTA 93		–	–	8	

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

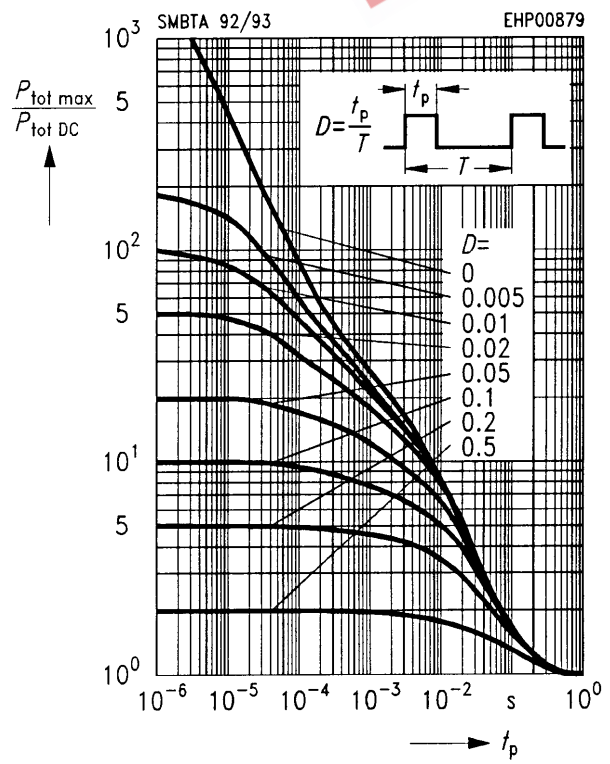
Total power dissipation $P_{tot} = f(T_A^*; T_S)$
* Package mounted on epoxy



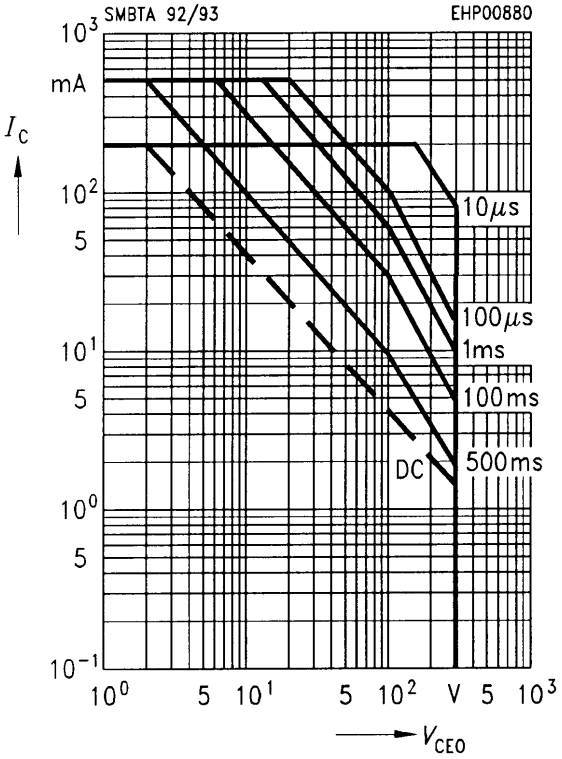
Transition frequency $f_T = f(I_C)$
V_{CE} = 20 V, f = 100 MHz



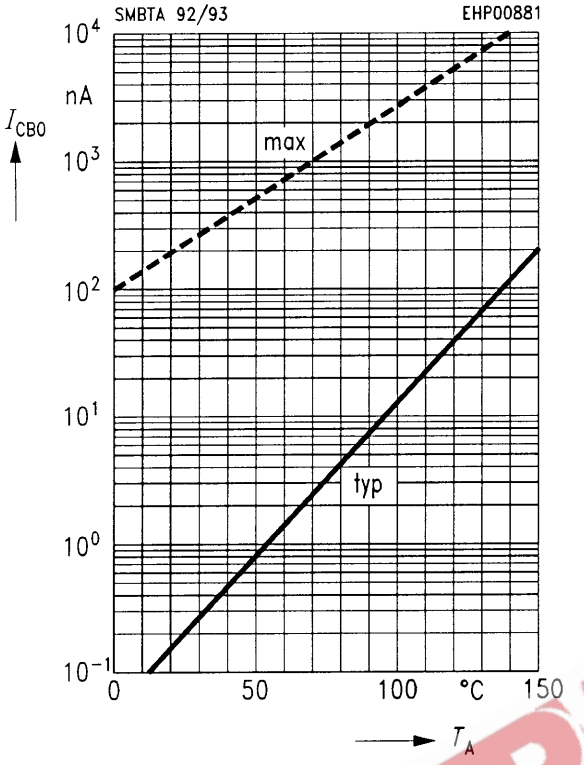
Permissible pulse load $P_{tot\,max}/P_{tot\,DC} = f(t_p)$



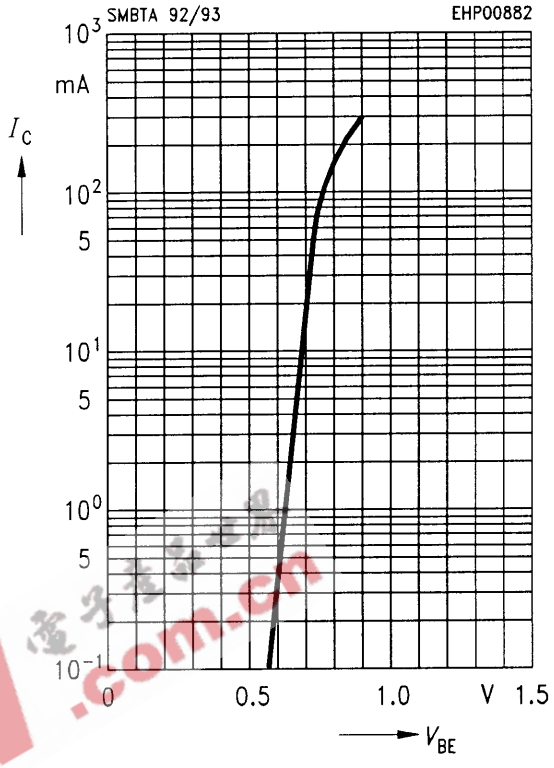
Operating range $I_C = f(V_{CE0})$
T_A = 25 °C, D = 0



Collector cutoff current $I_{CB0} = f(T_A)$
V_{CB} = 160 V



Collector current $I_C = f(V_{BE})$
V_{CE} = 10 V



DC current gain $h_{FE} = f(I_C)$
V_{CE} = 10 V