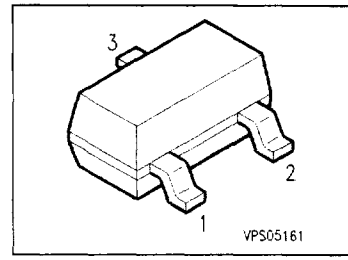
SIEMENS

NPN Silicon Darlington Transistors

SMBTA 13
SMBTA 14

- High DC current gain
- High collector current
- Collector-emitter saturation voltage



Type	Marking	Ordering Code (tape and reel)	Pin Configuration 1	2	3	Package[1]
SMBTA 13	s1M	Q68000-A6475	B	E	C	SOT-23
SMBTA 14	s1N	Q68000-A6476				

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CEO}	30	V
Collector-base voltage	V_{CBO}	30	
Emitter-base voltage	V_{EBO}	10	
Collector current	I_C	300	mA
Peak collector current	I_{CM}	500	
Base current	I_B	100	
Peak base current	I_{BM}	200	
Total power dissipation, T_S = 81 °C	P_{tot}	330	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	– 65 ... + 150	

Thermal Resistance

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

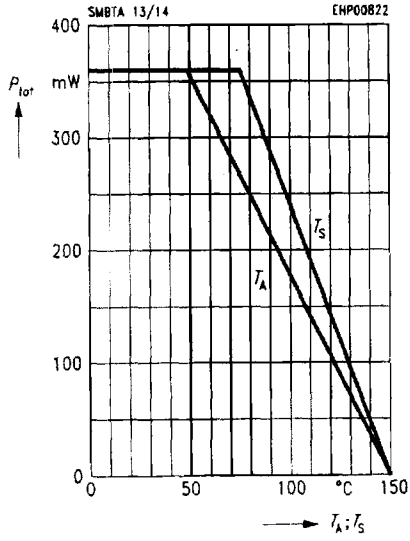
1) For detailed information see chapter Package Outlines.
2) Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm² Cu.

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

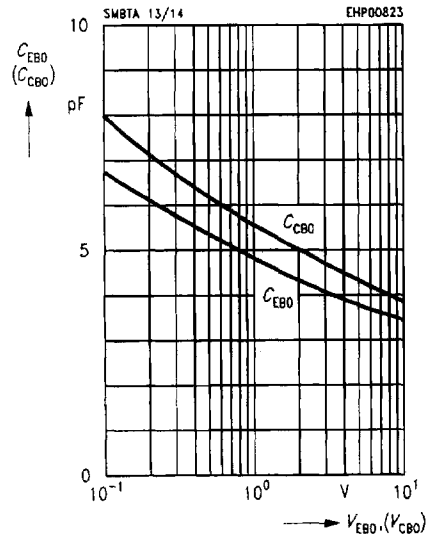
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC characteristics					
Collector-emitter breakdown voltage I_C = 10 µA	$V_{(BR)CE0}$	30	–	–	V
Collector-base breakdown voltage I_C = 10 µA	$V_{(BR)CB0}$	30	–	–	
Emitter-base breakdown voltage I_E = 10 µA	$V_{(BR)EB0}$	10	–	–	
Collector-base cutoff current V_{CB} = 30 V	I_{CB0}	–	–	100	nA
Emitter-base cutoff current V_{EB} = 10 V	I_{EB0}	–	–	100	
DC current gain	h_{FE}				–
I_C = 10 mA, V_{CE} = 5 V[1] SMBTA 13		5000	–	–	
SMBTA 14		10000	–	–	
I_C = 100 mA, V_{CE} = 5 V[1] SMBTA 13		10000	–	–	
SMBTA 14		20000	–	–	
Collector-emitter saturation voltage[1] I_C = 100 mA, I_B = 0.1 mA	V_{CEsat}	–	–	1.5	V
Base-emitter saturation voltage[1] I_C = 100 mA, I_B = 0.1 mA	V_{BEsat}	–	–	2	
AC characteristics					
Transition frequency I_C = 50 mA, V_{CE} = 5 V, f = 20 MHz	f_t	125	–	–	MHz

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

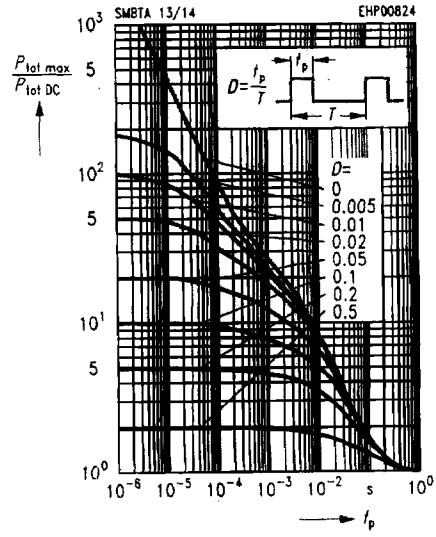
Total power dissipation $P_{tot} = f(T_A^*; T_S)$
* Package mounted on epoxy



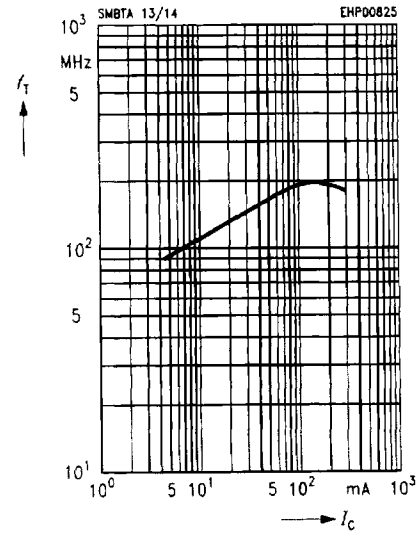
Capacitance $C_{CBO} = f(V_{CBO})$
$C_{EBO} = f(V_{EBO})$
f = 1 MHz



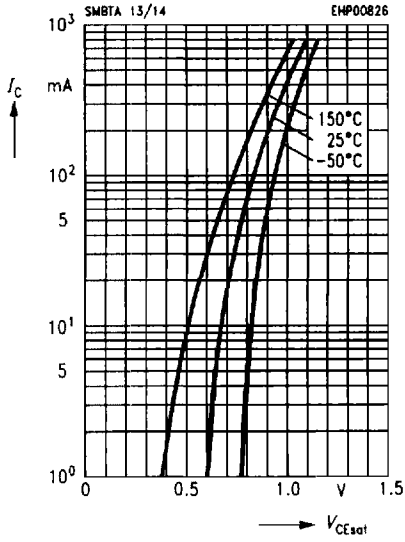
Permissible pulse load $P_{tot\,max} / P_{tot\,DC} = f(t_P)$



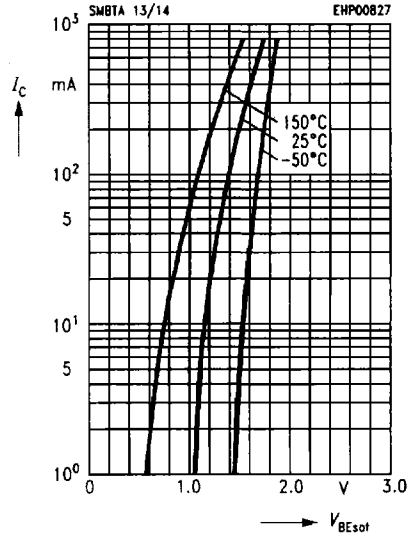
Transition frequency $f_T = f(I_C)$
V_{CE} = 5 V, f = 20 MHz



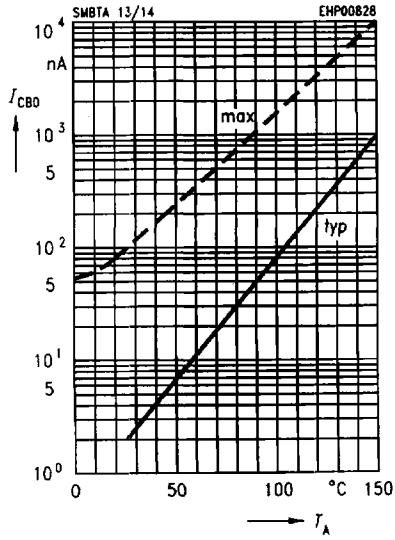
Base-emitter saturation voltage
$I_C = f(V_{BE\,sat})$
$h_{FE} = 1000$



Collector-emitter saturation voltage
$I_C = f(V_{CE\,sat})$
$h_{FE} = 1000$



Collector cutoff current $I_{CB0} = f(T_A)$
$V_{CB} = 30$ V



DC current gain $h_{FE} = f(I_C)$
$V_{CE} = 5$ V