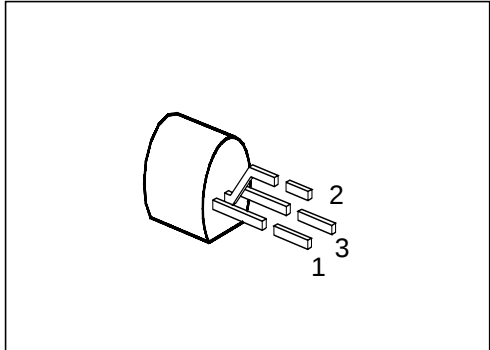


PNP Silicon Darlington Transistor

BC 516

- High current gain
- High collector current
- Complementary type: BC 517 (NPN)



Type	Marking	Ordering Code	Pin Configuration			Package ¹⁾
			1	2	3	
BC 516	—	Q62702-C944	C	B	E	TO-92

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE0}	30	V
Collector-base voltage	V_{CB0}	40	
Emitter-base voltage	V_{EB0}	10	
Collector current	I_C	500	mA
Peak collector current	I_{CM}	800	
Base current	I_B	100	
Peak base current	I_{BM}	200	
Total power dissipation, $T_c = 66\text{ °C}$	P_{tot}	625	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	– 65 ... + 150	

Thermal Resistance

Junction - ambient	$R_{th\ JA}$	≤ 200	K/W
Junction - case ²⁾	$R_{th\ JC}$	≤ 135	

¹⁾ For detailed information see chapter Package Outlines.

²⁾ Mounted on Al heat sink 15 mm × 25 mm × 0.5 mm.

Electrical Characteristics

at $T_A = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics

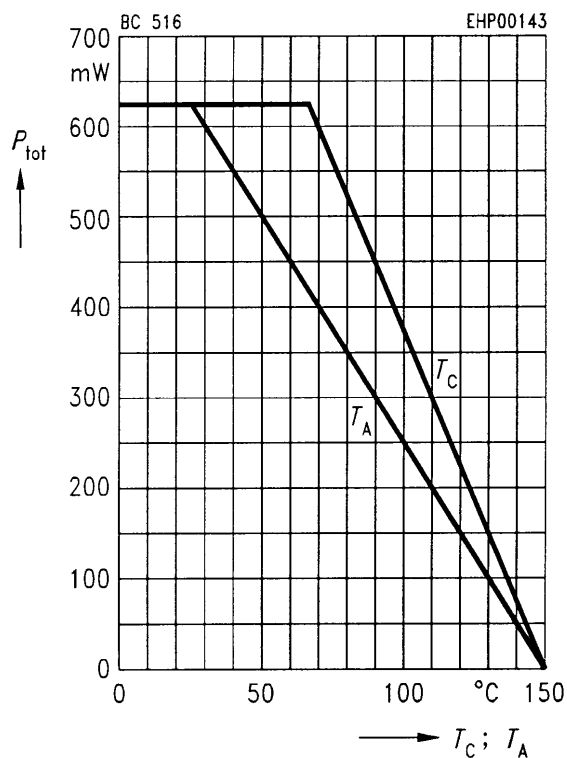
Collector-emitter breakdown voltage $I_C = 10\text{ mA}$	$V_{(BR)CE0}$	30	—	—	V
Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CB0}$	40	—	—	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$	$V_{(BR)EB0}$	10	—	—	
Collector cutoff current $V_{CB} = 30\text{ V}$ $V_{CB} = 30\text{ V}, T_A = 150\text{ °C}$	I_{CB0}	— —	— —	100 10	nA μA
Emitter cutoff current $V_{EB} = 4\text{ V}$	I_{EB0}	—	—	100	μA
DC current gain $I_C = 20\text{ mA}; V_{CE} = 2\text{ V}$	h_{FE}	30 000	—	—	—
Collector-emitter saturation voltage ¹⁾ $I_C = 100\text{ mA}; I_B = 0.1\text{ mA}$	V_{CEsat}	—	—	1	V
Base-emitter voltage ¹⁾ $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	V_{BE}	—	—	1.4	

AC characteristics

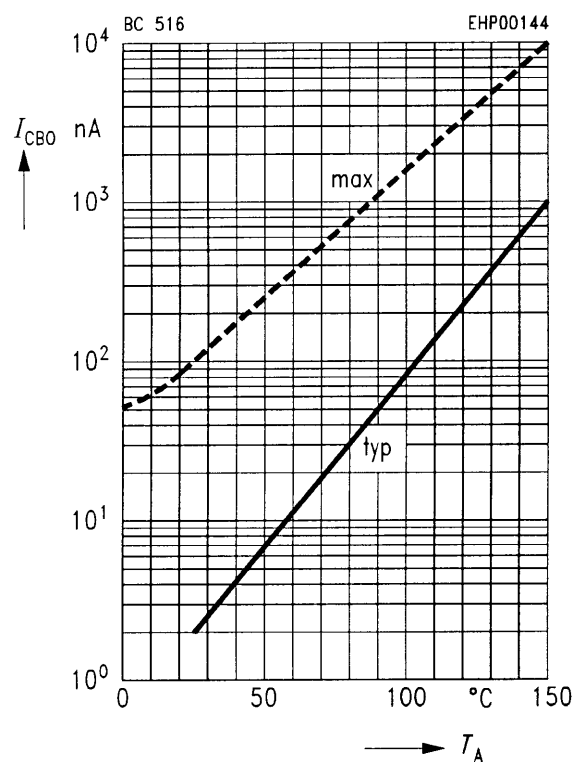
Transition frequency $I_C = 50\text{ mA}, V_{CE} = 5\text{ V}, f = 20\text{ MHz}$	f_T	—	200	—	MHz
Output capacitance $V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	C_{obo}	—	3.5	—	pF

¹⁾ Pulse test: $t \leq 300\text{ }\mu\text{s}, D \leq 2\text{ %}$.

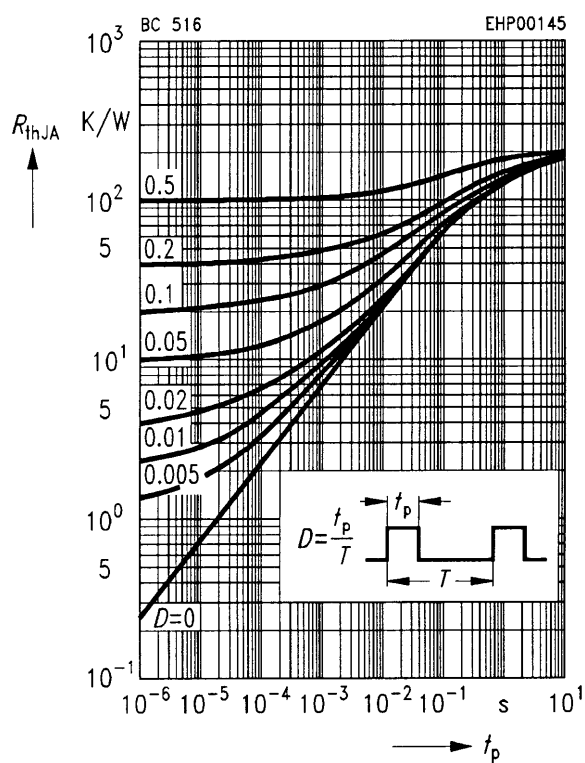
Total power dissipation $P_{\text{tot}} = f(T_A; T_C)$



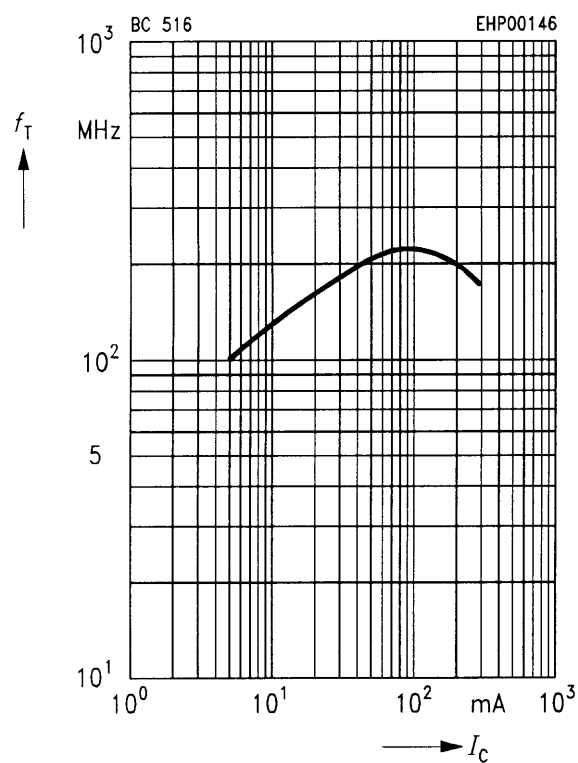
Collector cutoff current $I_{\text{CB0}} = f(T_A)$
 $V_{\text{CB}} = 30 \text{ V}$



Permissible pulse load $R_{\text{thJA}} = f(t_p)$



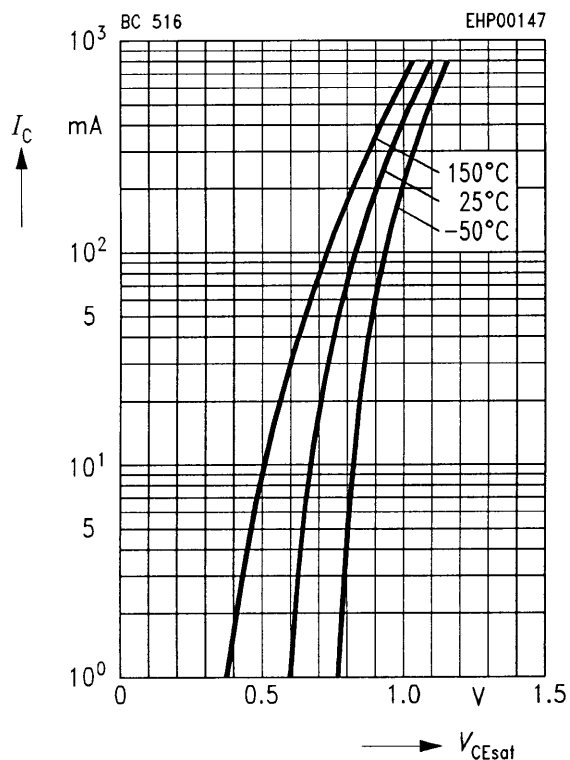
Transition frequency $f_T = f(I_C)$
 $V_{\text{CE}} = 5 \text{ V}$



Collector-emitter saturation voltage

$$I_C = f(V_{CEsat})$$

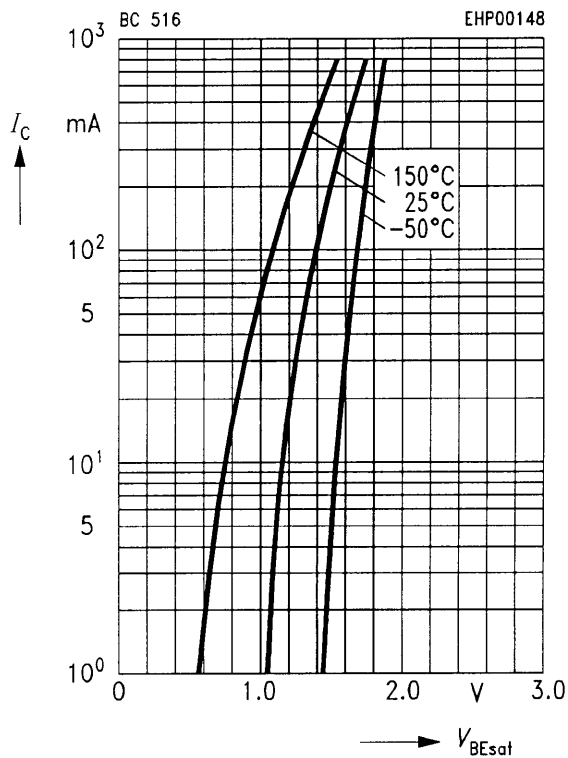
$$h_{FE} = 1000$$



Base-emitter saturation voltage

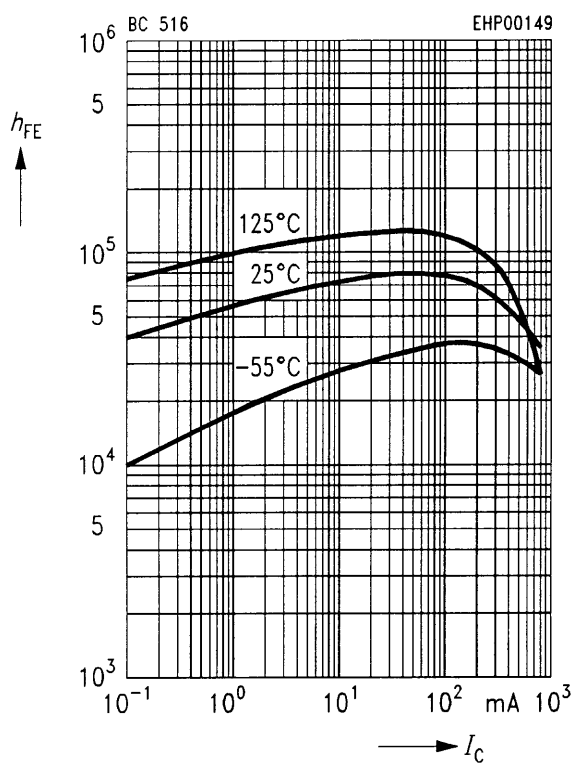
$$I_C = f(V_{BEsat})$$

$$h_{FE} = 1000$$



DC current gain $h_{FE} = f(I_C)$

$$V_{CE} = 2 \text{ V}$$



Capacitance $C = f(V_{EB}, V_{CB})$

