

SOT-223 Plastic-Encapsulate Transistors

BCP56-16

NPN Silicon AF Transistors

FEATURES

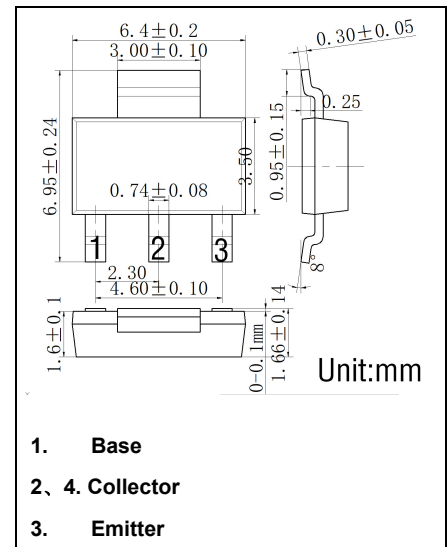
- High current (max. 1 A)
- Low voltage (max. 80 V).

APPLICATIONS

- Switching.

DESCRIPTION

NPN medium power transistor in a SOT223 plastic package. PNP complements: BCP51, BCP52 and BCP53.



Maximum Ratings

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	BCP54		—	45	V
	BCP55		—	60	V
	BCP56		—	100	V
V_{CEO}	collector-emitter voltage	open base			
	BCP54		—	45	V
	BCP55		—	60	V
	BCP56		—	80	V
V_{EBO}	emitter-base voltage	open collector	—	5	V
I_C	collector current (DC)		—	1	A
I_{CM}	peak collector current		—	1.5	A
I_{BM}	peak base current		—	0.2	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$; note 1	—	1.33	W
T_{stg}	storage temperature		−65	+150	$^{\circ}\text{C}$
T_j	junction temperature		—	150	$^{\circ}\text{C}$
T_{amb}	operating ambient temperature		−65	+150	$^{\circ}\text{C}$

Note

1. Device mounted on printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm². For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	94	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		13	K/W

Note

1. Device mounted on printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm². For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

Electrical Characteristics

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

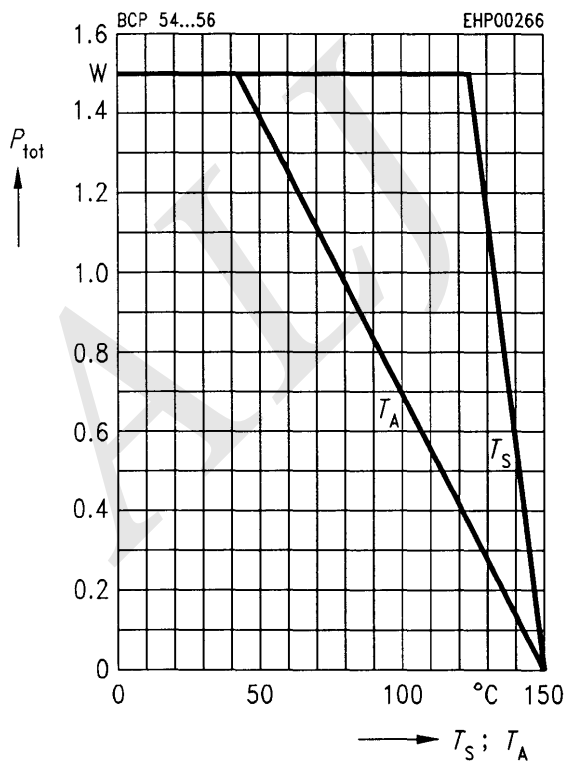
Symbol	Parameter	Values			Unit
		min.	typ.	max.	
DC characteristics					
$V_{(BR)CE0}$	Collector-emitter breakdown voltage $I_C = 10\text{ mA}$, $I_B = 0$ BCP 54 BCP 55 BCP 56	45 60 80	— — —	—	V
$V_{(BR)CB0}$	Collector-base breakdown voltage ¹⁾ $I_C = 100\text{ }\mu\text{A}$, $I_B = 0$ BCP 54 BCP 55 BCP 56	45 60 100	— — —	—	
$V_{(BR)EB0}$	Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$, $I_C = 0$	5	—	—	
I_{CB0}	Collector-base cutoff current $V_{CB} = 30\text{ V}$, $I_E = 0$ $V_{CB} = 30\text{ V}$, $I_E = 0$, $T_A = 150\text{ }^{\circ}\text{C}$	— —	— —	100 20	nA μA
I_{EB0}	Emitter-base cutoff current $V_{EB} = 5\text{ V}$	—	—	10	μA
h_{FE}	DC current gain $I_C = 5\text{ mA}$, $V_{CE} = 2\text{ V}$ $I_C = 150\text{ mA}$, $V_{CE} = 2\text{ V}$ BCP 54/BCP 55/BCP 56 BCP 54/BCP 55/BCP 56-10 BCP 54/BCP 55/BCP 56-16 $I_C = 500\text{ mA}$, $V_{CE} = 2\text{ V}$	25 40 63 100 25	— — 100 160 —	— 250 160 250 —	—
V_{CEsat}	Collector-emitter saturation voltage ¹⁾ $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	—	—	0.5	V
V_{BE}	Base-emitter voltage ¹⁾ $I_C = 500\text{ mA}$, $V_{CE} = 2\text{ V}$	—	—	1	
AC characteristics					
f_T	Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$	—	100	—	MHz

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

Typical Characteristics

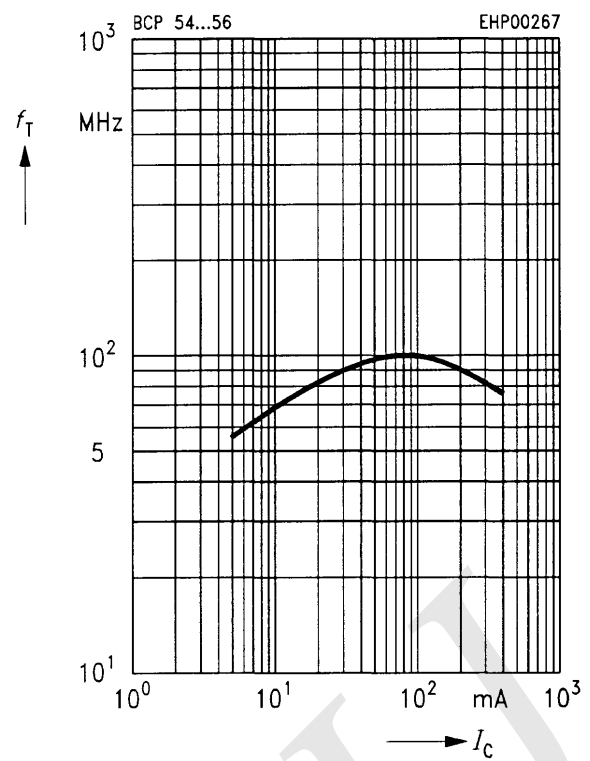
Total power dissipation $P_{\text{tot}} = f(T_A^*; T_S)$

* Package mounted on epoxy



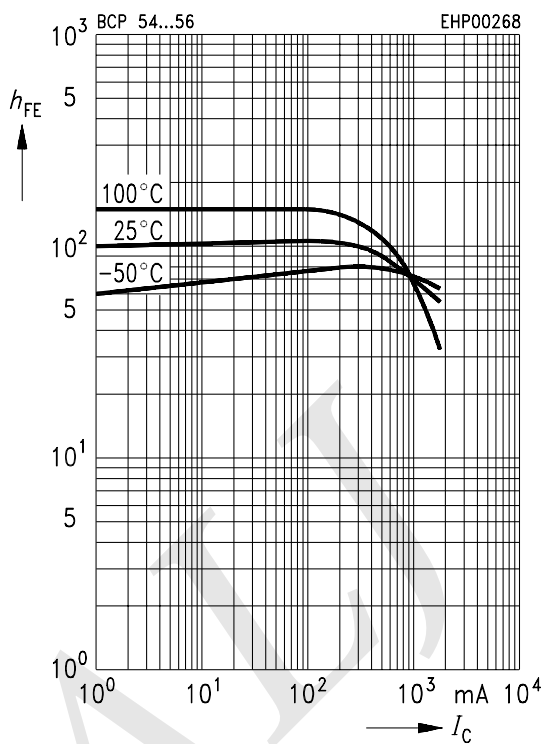
Transition frequency $f_T = f(I_C)$

$V_{CE} = 10 \text{ V}$



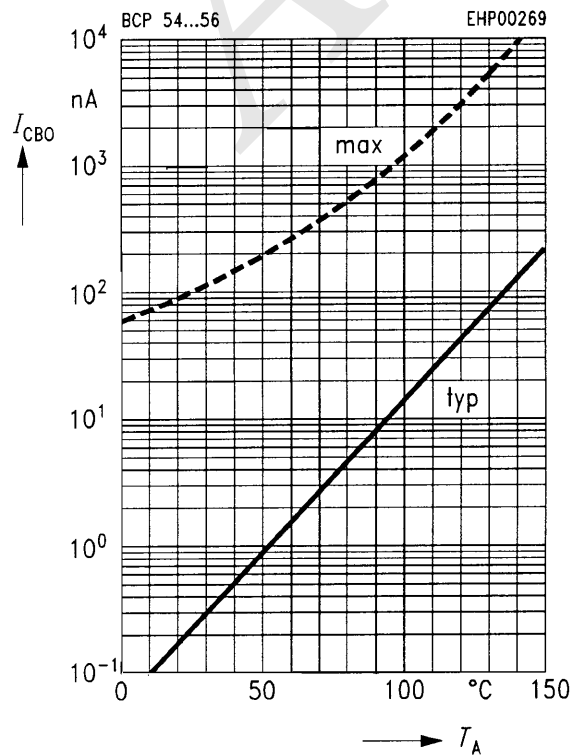
DC current gain $h_{FE} = f(I_C)$

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



Collector cutoff current $I_{CB0} = f(T_A)$

$V_{CB} = 30 \text{ V}$

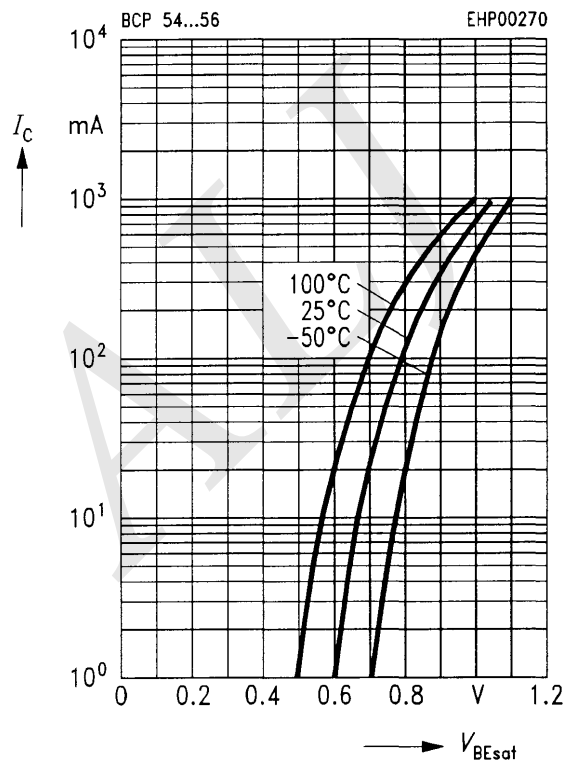


Typical Characteristics

Base-emitter saturation voltage

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

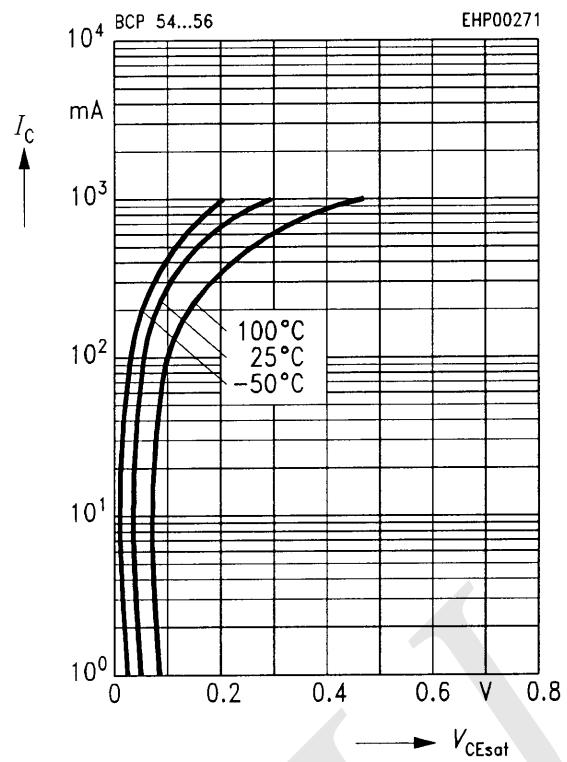
$$h_{FE} = 10$$



Collector-emitter saturation voltage

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

$$h_{FE} = 10$$



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

