SOT-223 Plastic-Encapsulate Transistors

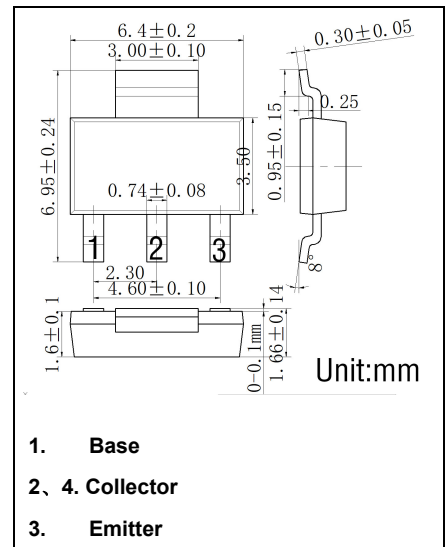## BCP56-16

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.

Unit:mm

1. **Base**
2、4. **Collector**
3. **Emitter**

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		$T_{amb} \leq 25\ °C$; note 1	–	1.33	W
T_{stg}	storage temperature			–65	+150	°C
T_j	junction temperature			–	150	°C
T_{amb}	operating ambient temperature			–65	+150	°C

Note

1. Device mounted on printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm^2. For other mounting conditions, see *"Thermal considerations for SOT223 in the General Part of associated Handbook".*
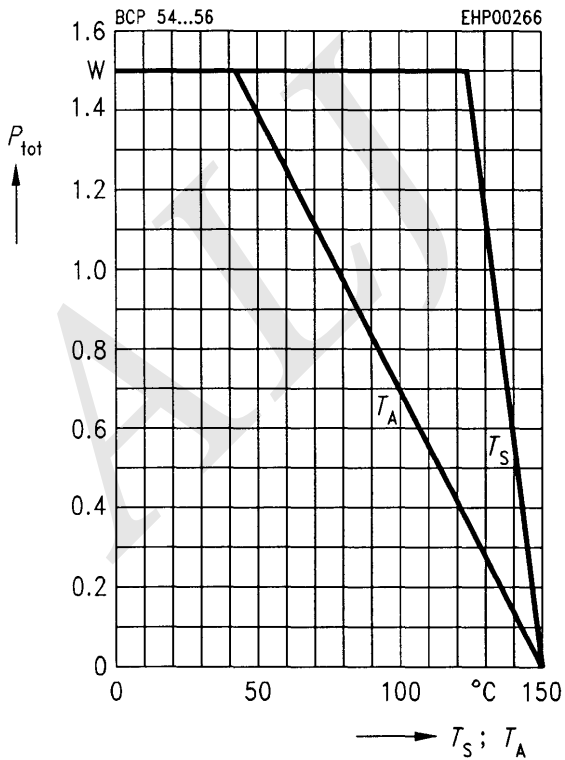
THERMAL CHARACTERISTICS

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 cm^2. For other mounting conditions, see *"Thermal considerations for SOT223 in the General Part of associated Handbook".*

Electrical Characteristics

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

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

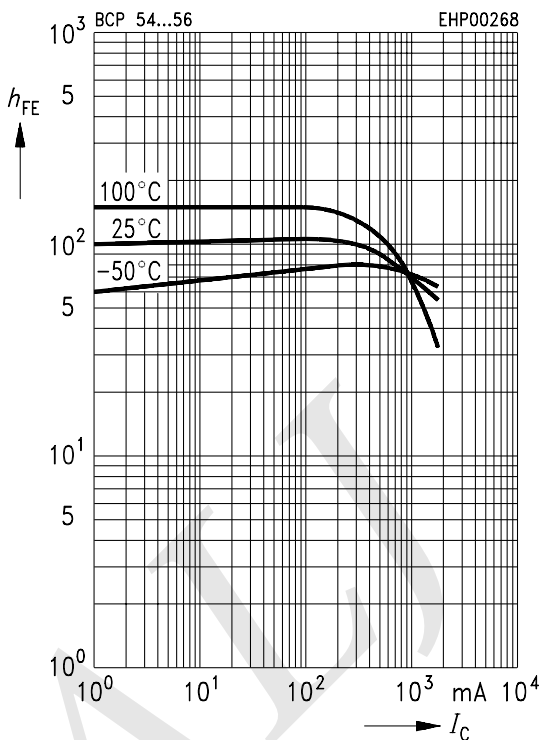[1] Pulse test conditions: $t \le 300\ \mu s$, $D = 2\ \%$.

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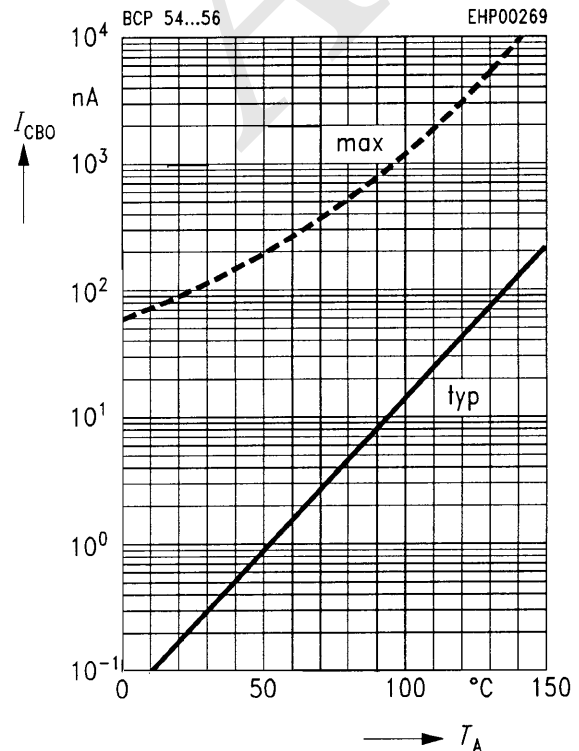* Package mounted on epoxy

Transition frequency $f_T = f(I_C)$
$V_{CE} = 10$ V
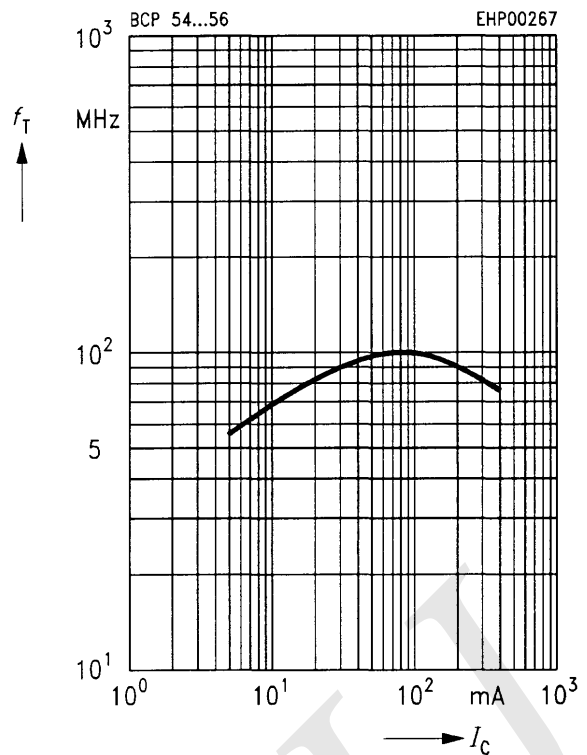
DC current gain $h_{FE} = f(I_C)$
$V_{CE} = 2$ V

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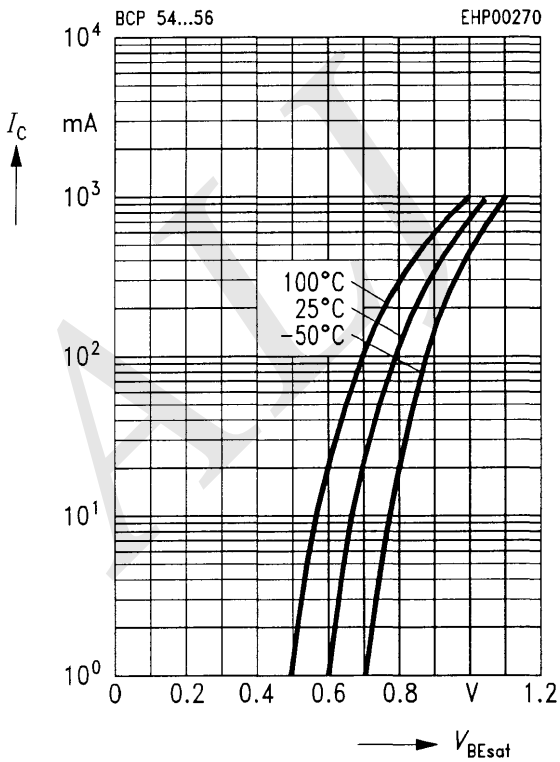$V_{CB} = 30$ V

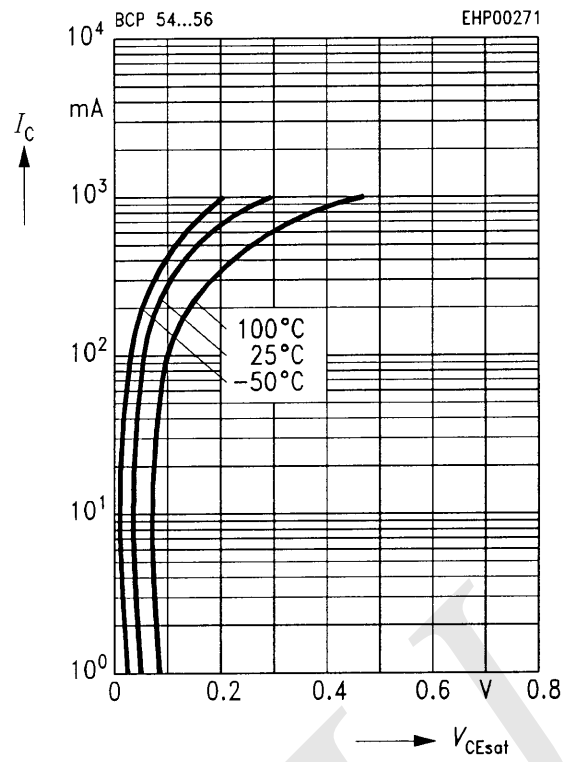## Base-emitter saturation voltage
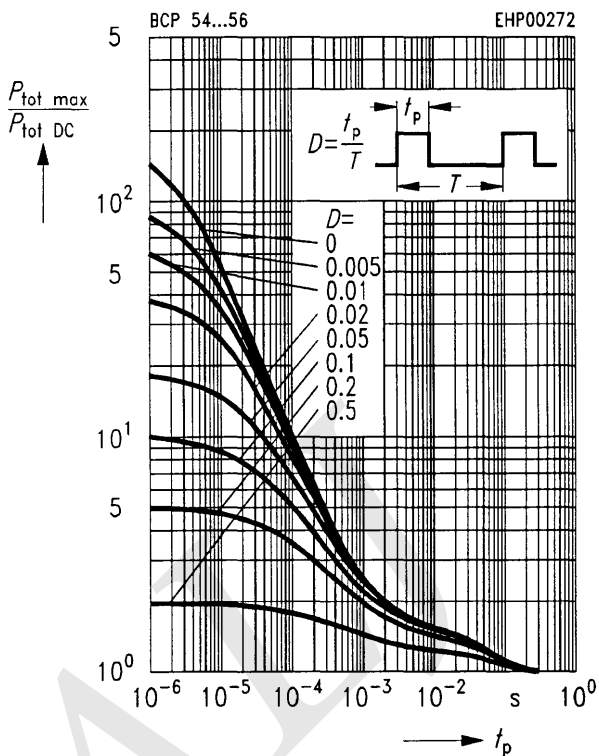
$I_C = f(V_{BEsat})$

$h_{FE} = 10$

Collector-emitter saturation voltage

$I_C = f(V_{CEsat})$

$h_{FE} = 10$

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

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