

## SILICON PLANAR EPITAXIAL TRANSISTORS

General purpose p-n-p transistors in plastic TO-92 envelopes, especially suitable for use in driver stages of audio amplifiers.

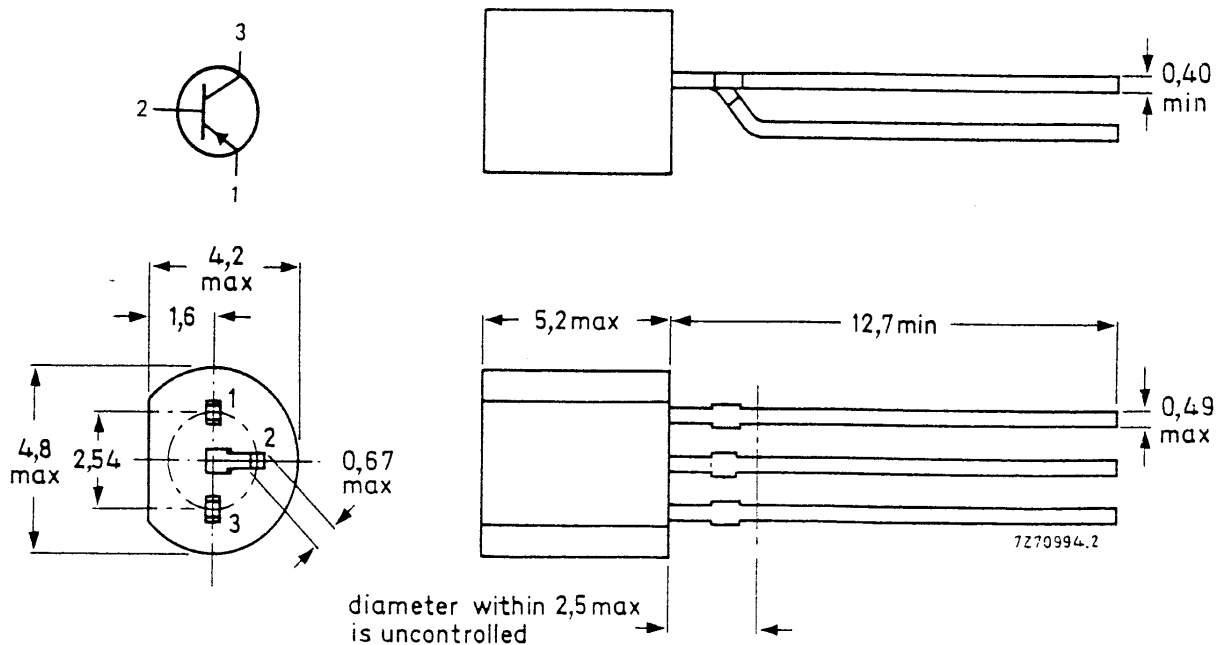
## QUICK REFERENCE DATA

		BC556	BC557	BC558	
Collector-emitter voltage (+ $V_{BE} = 0$ V)	$-V_{CES}$ max.	80	50	30	V
Collector-emitter voltage (open base)	$-V_{CEO}$ max.	65	45	30	V
D.C. current gain $-I_C = 2$ mA; $-V_{CE} = 5$ V	$h_{FE} >$	75	75	75	
	$h_{FE} <$	475	800	800	
Collector current (peak value)	$-I_{CM}$ max.		200		mA
Total power dissipation up to $T_{amb} = 25$ °C	$P_{tot}$ max.		500		mW
Junction temperature	$T_j$ max.		150		°C
Transition frequency at $f = 35$ MHz $-I_C = 10$ mA; $-V_{CE} = 5$ V	$f_T$ typ.		200		MHz
Noise figure at $R_S = 2$ k $\Omega$ $-I_C = 200$ $\mu$ A; $-V_{CE} = 5$ V $f = 1$ kHz; $B = 200$ Hz	F typ.		2		dB

## MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.



# BC556 to 558

## RATINGS

Limiting values in accordance with the Absolute Maximum Values for the Semiconductor (JEDEC 101-1)

			BC556	BC557	BC558	
Collector-base voltage (open emitter)	$-V_{CB0}$	max.	80	50	30	V
Collector-emitter voltage ( $V_{BE} = 0$ )	$-V_{CES}$	max.	80	50	30	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	65	45	30	V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5	5	5	V
Collector current (d.c.)	$-I_C$	max.		100		mA
Collector current (peak value)	$-I_{CM}$	max.		200		mA
Emitter current (peak value)	$I_{EM}$	max.		200		mA
Base current (peak value)	$-I_{BM}$	max.		200		mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	$P_{tot}$	max.		500		mW
Storage temperature	$T_{stg}$			-65 to +150		$^{\circ}\text{C}$
Junction temperature	$T_j$	max.		150		$^{\circ}\text{C}$

## THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=		250		K/W
From junction to case	$R_{th\ j-c}$	=		150		K/W

## CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Collector cut-off current $I_E = 0$ ; $-V_{CB} = 30\text{ V}$ ; $T_j = 25\text{ }^{\circ}\text{C}$	$-I_{CBO}$	typ. <		1 15		nA nA
$T_j = 150\text{ }^{\circ}\text{C}$	$-I_{CBO}$	<		4		$\mu\text{A}$
Base-emitter voltage* $-I_C = 2\text{ mA}$ ; $-V_{CE} = 5\text{ V}$	$-V_{BE}$	typ.		650		mV
$-I_C = 10\text{ mA}$ ; $-V_{CE} = 5\text{ V}$	$-V_{BE}$	<		600 to 750		mV
Saturation voltages** $-I_C = 10\text{ mA}$ ; $-I_B = 0,5\text{ mA}$	$-V_{CEsat}$	typ. <		60 300		mV mV
	$-V_{BEsat}$	typ.		750		mV
$-I_C = 100\text{ mA}$ ; $-I_B = 5\text{ mA}$	$-V_{CEsat}$	typ. <		180 650		mV mV
	$-V_{BEsat}$	typ.		930		mV

\*  $-V_{BE}$  decreases by about 2 mV/K with increasing temperature.

\*\*  $-V_{BEsat}$  decreases by about 1,7 mV/K with increasing temperature.

Collector capacitance at  $f = 1 \text{ MHz}$

$I_E = I_e = 0; -V_{CE} = 10 \text{ V}$

$C_C$	typ.	4	pF
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Transition frequency at  $f = 35 \text{ MHz}$

$-I_C = 10 \text{ mA}; -V_{CE} = 5 \text{ V}$

$f_T$	typ.	200	MHz
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Small-signal current gain at  $f = 1 \text{ kHz}$

$-I_C = 2 \text{ mA}; -V_{CE} = 5 \text{ V}$

$h_{fe}$		75 to 900	
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Noise figure at  $R_S = 2 \text{ k}\Omega$

$-I_C = 200 \mu\text{A}; -V_{CE} = 5 \text{ V}$

$f = 1 \text{ kHz}; B = 200 \text{ Hz}$

$F$	typ.	2	dB
	<	10	dB

D.C. current gain

$-I_C = 2 \text{ mA}; -V_{CE} = 5 \text{ V}$

	BC556	BC557 BC558	BC556A BC557A BC558A	BC556B BC557B BC558B	BC557C BC558C
$h_{FE} >$	75	75	125	220	420
$h_{FE} <$	475	800	250	475	800

# BC556 to 558

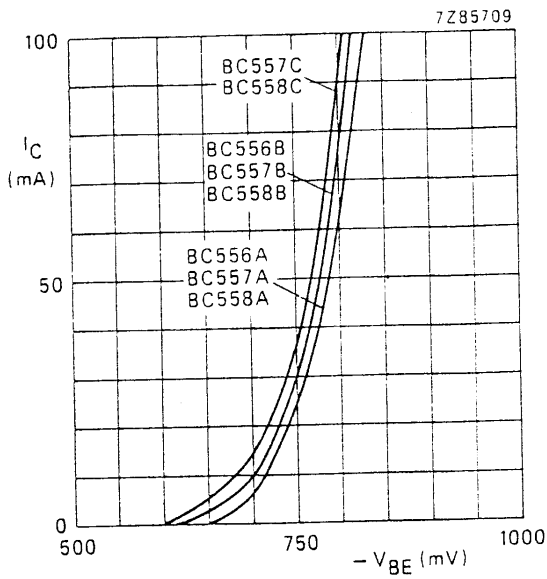


Fig. 2  $-V_{CE} = 5 \text{ V}; T_j = 25 \text{ }^\circ\text{C}.$

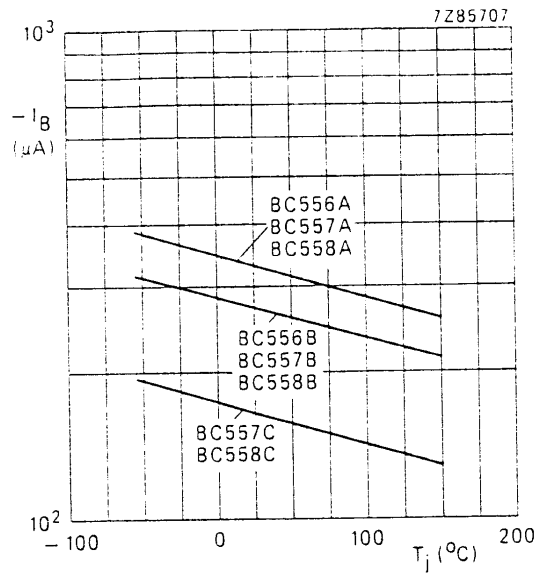


Fig. 3  $-V_{CE} = 5 \text{ V}; I_C = 50 \text{ mA}.$

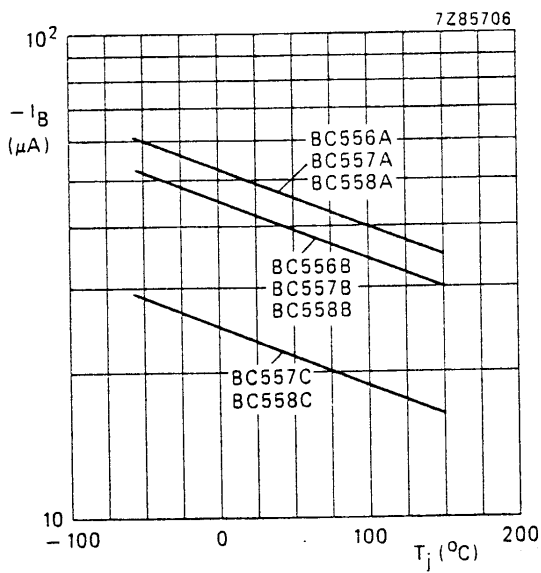


Fig. 4  $-V_{CE} = 5 \text{ V}; I_C = 10 \text{ mA}.$

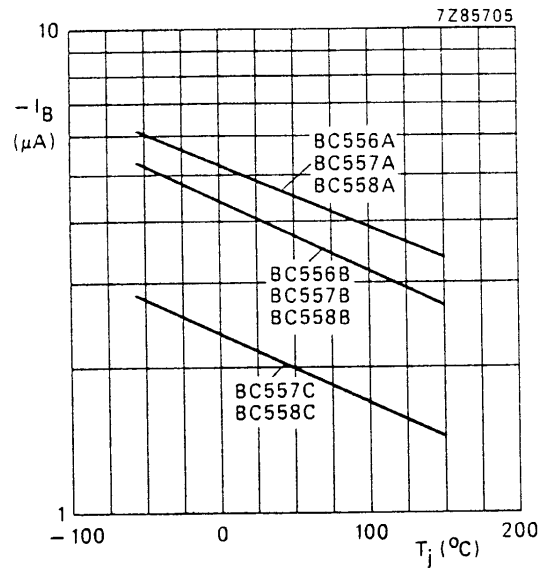


Fig. 5  $-V_{CE} = 5 \text{ V}; I_C = 1 \text{ mA}.$

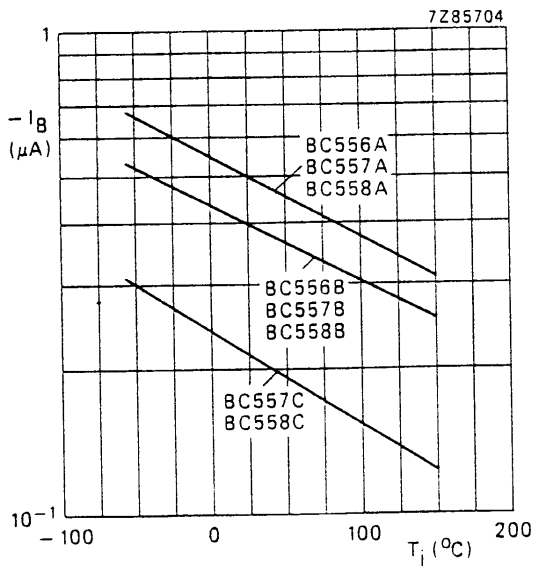


Fig. 6  $-V_{CE} = 5 \text{ V}; I_C = 0,1 \text{ mA}.$

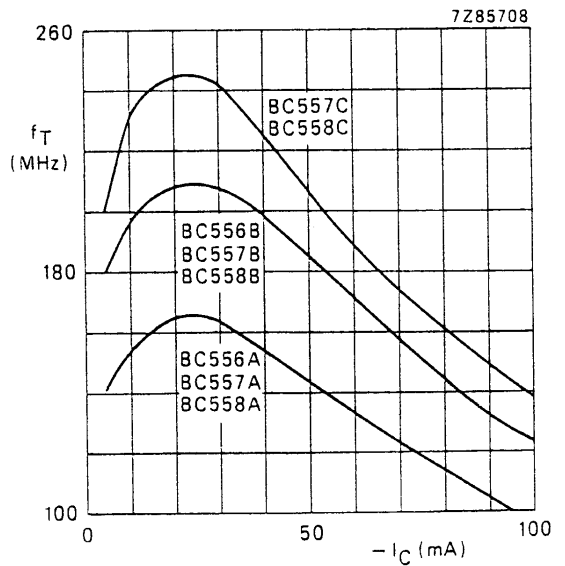


Fig. 7  $-V_{CE} = 5 \text{ V}; T_j = 25 \text{ }^\circ\text{C}; f = 35 \text{ MHz}.$

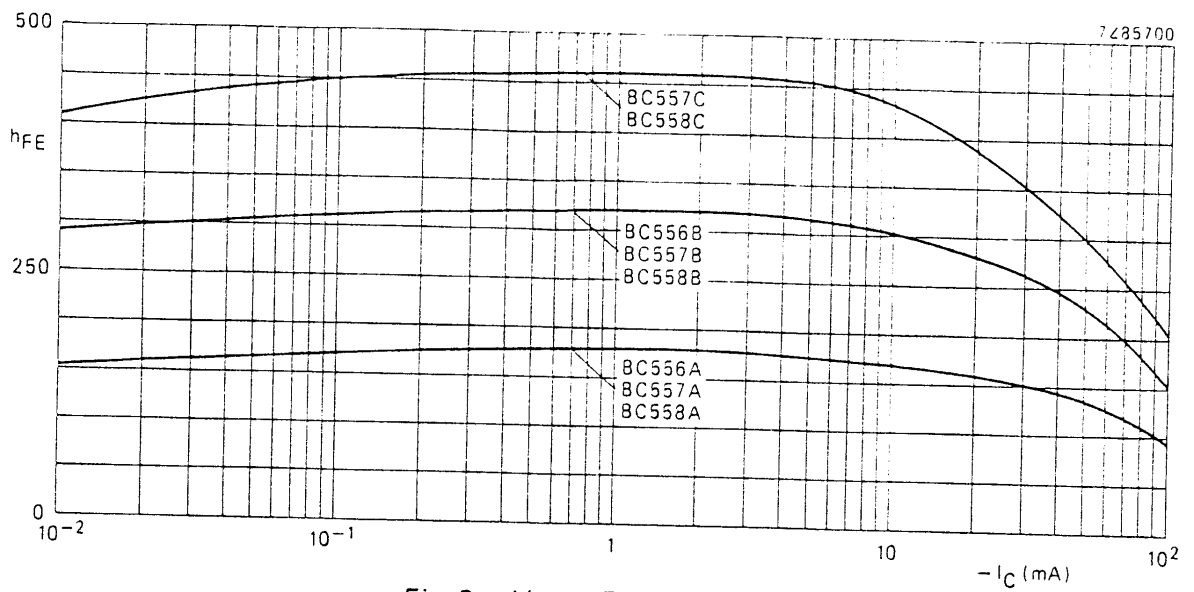


Fig. 8  $-V_{CE} = 5 \text{ V}; T_j = 25 \text{ }^\circ\text{C}.$

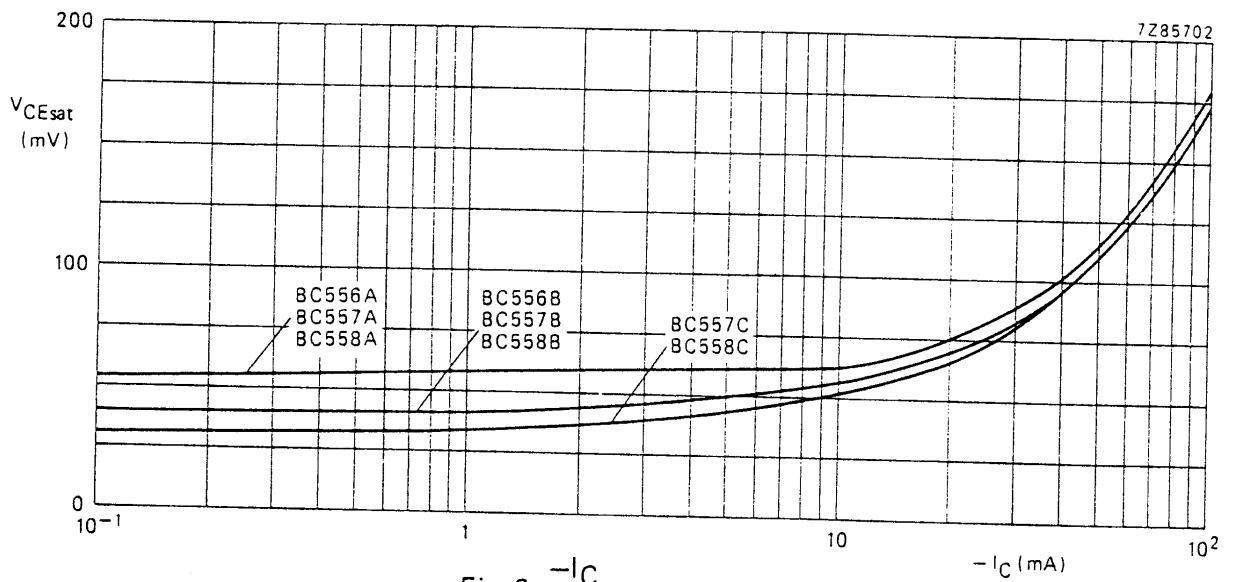


Fig. 9  $\frac{-I_C}{-I_B} = 20; T_j = 25 \text{ }^\circ\text{C}.$

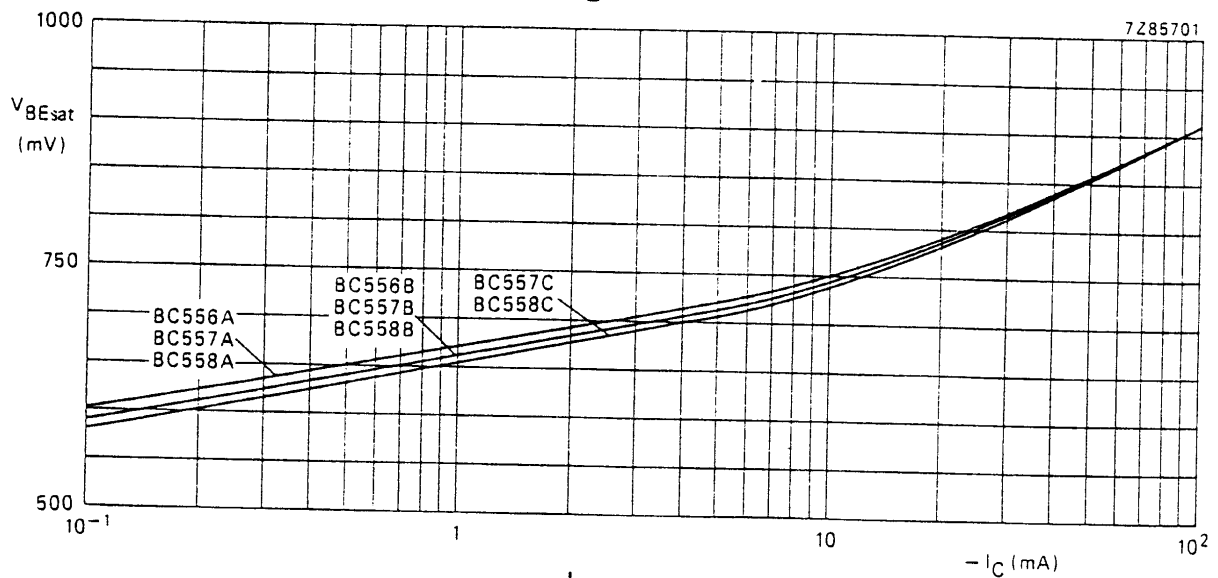


Fig. 10  $\frac{-I_C}{-I_B} = 20; T_j = 25 \text{ }^\circ\text{C}.$

# BC556 to 558

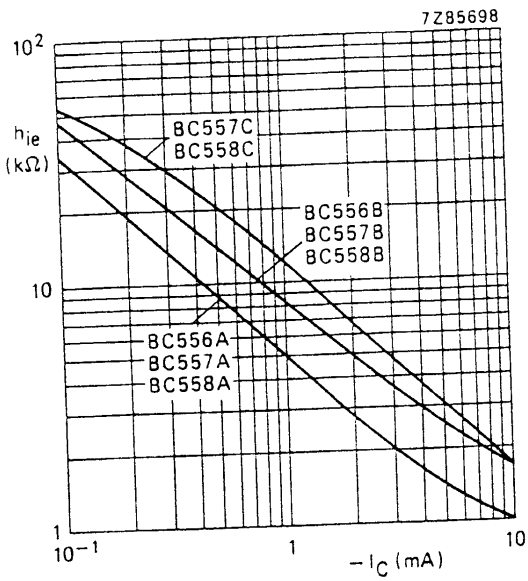


Fig. 11.

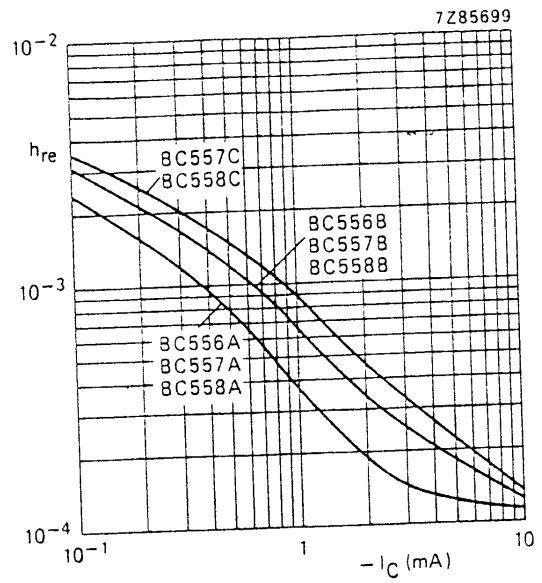


Fig. 12.

For Figs 11, 12, 13 and 14 the following conditions apply:  $-V_{CE} = 5 \text{ V}$ ;  $f = 1 \text{ kHz}$ ;  $T_j = 25 \text{ }^\circ\text{C}$ .

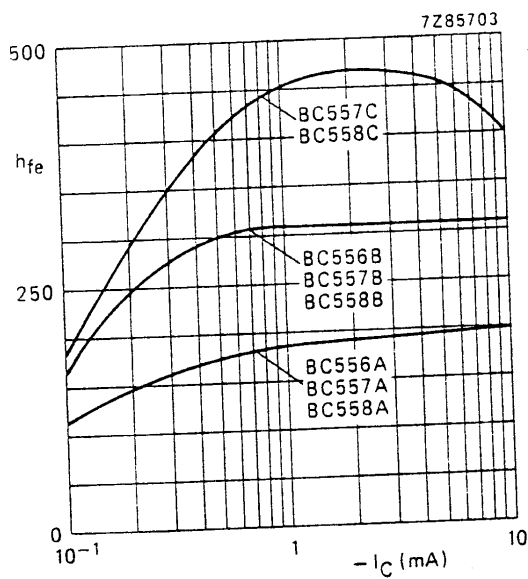


Fig. 13.

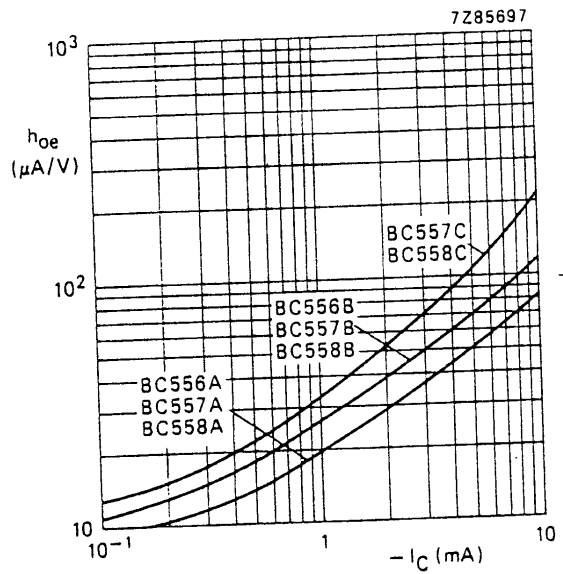


Fig. 14.

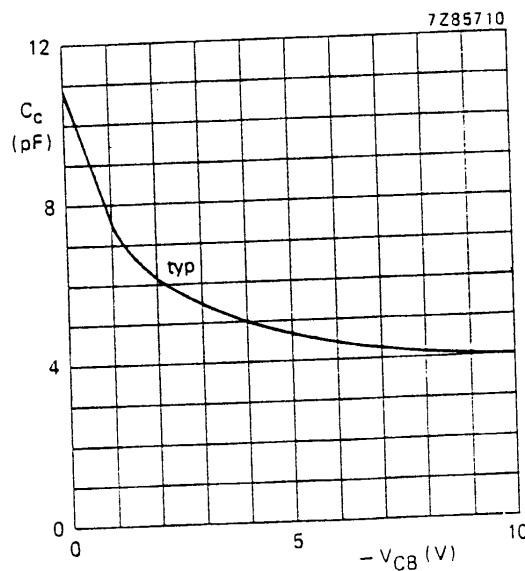


Fig. 15  $f = 1 \text{ MHz}$ ;  $T_j = 25 \text{ }^\circ\text{C}$ .