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.

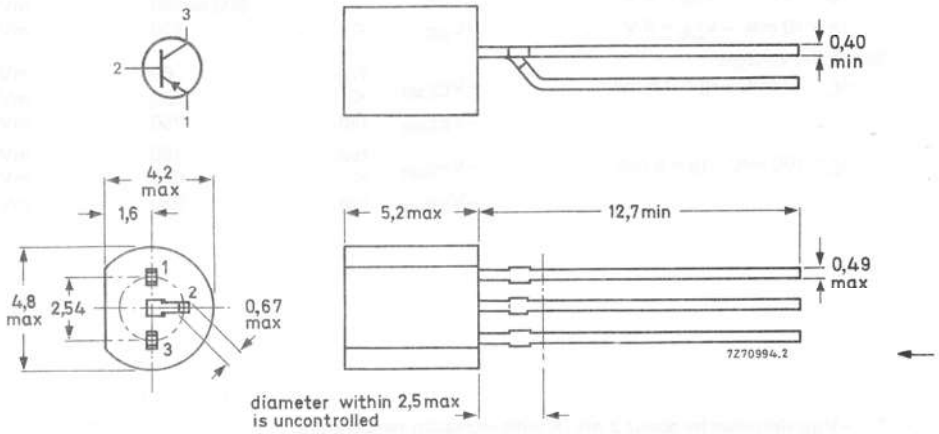
QUICK REFERENCE DATA

			BC556	BC557	BC558	
Collector-emitter voltage (+ V_{BE} = 1 V)	$-V_{CEX}$	max.	80	50	30	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	65	45	30	V
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
Small-signal current gain $-I_C$ = 2 mA; $-V_{CE}$ = 5 V; f = 1 kHz	h_{fe}			75 to 900		
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 kΩ $-I_C$ = 200 μA; $-V_{CE}$ = 5 V f = 1 kHz; B = 200 Hz	F	<		10		dB

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			BC556	BC557	BC558	
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	80	50	30	V
Collector-emitter voltage (+ V_{BE} = 1 V)	$-V_{CEX}$	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 °C	P_{tot}	max.		500		mW
Storage temperature	T_{stg}			−65 to + 150		°C
Junction temperature	T_j	max.		150		°C

THERMAL RESISTANCE

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

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

Collector cut-off current						
I_E = 0; $-V_{CB}$ = 30 V; T_j = 25 °C	$-I_{CBO}$	typ.		1		nA
	$-I_{CBO}$	<		15		nA
T_j = 150 °C	$-I_{CBO}$	<		4		μA
Base-emitter voltage*						
$-I_C$ = 2 mA; $-V_{CE}$ = 5 V	$-V_{BE}$	typ.		650		mV
				600 to 750		mV
$-I_C$ = 10 mA; $-V_{CE}$ = 5 V	$-V_{BE}$	<		820		mV
Saturation voltages**						
$-I_C$ = 10 mA; $-I_B$ = 0,5 mA	$-V_{CEsat}$	typ.		60		mV
	$-V_{CEsat}$	<		300		mV
	$-V_{BEsat}$	typ.		750		mV
$-I_C$ = 100 mA; $-I_B$ = 5 mA	$-V_{CEsat}$	typ.		180		mV
	$-V_{CEsat}$	<		650		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.

Knee voltage				
$-I_C$ = 10 mA; $-I_B$ = value for which		typ.	250	mV
$-I_C$ = 11 mA at $-V_{CE}$ = 1 V	$-V_{CEK}$	<	600	mV

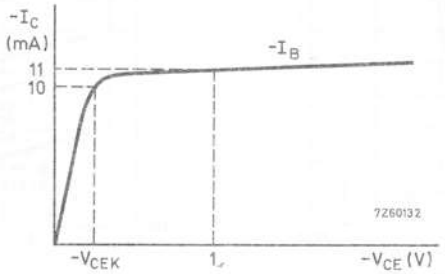


Fig. 2.

Collector capacitance at f = 1 MHz				
$I_E = I_e = 0$; $-V_{CE}$ = 10 V	C_c	typ.	4	pF
Transition frequency at f = 35 MHz				
$-I_C$ = 10 mA; $-V_{CE}$ = 5 V	f_T	typ.	200	MHz
Small-signal current gain at f = 1 kHz				
$-I_C$ = 2 mA; $-V_{CE}$ = 5 V	h_{fe}		75 to 900	
Noise figure at R_S = 2 kΩ				
$-I_C$ = 200 μA; $-V_{CE}$ = 5 V		typ.	2	dB
f = 1 kHz; B = 200 Hz	F	<	10	dB

			BC556 BC557 BC558	BC556A BC557A BC558A	BC556B BC557B BC558B	BC557C BC558C
D.C. current gain						
$-I_C$ = 2 mA; $-V_{CE}$ = 5 V	h_{FE}	>	75	125	220	420
		<	900	250	475	800

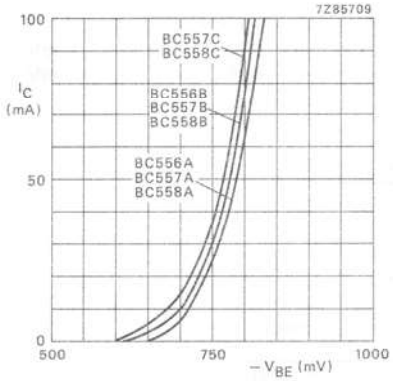


Fig. 3 $-V_{CE} = 5$ V; $T_j = 25$ °C.

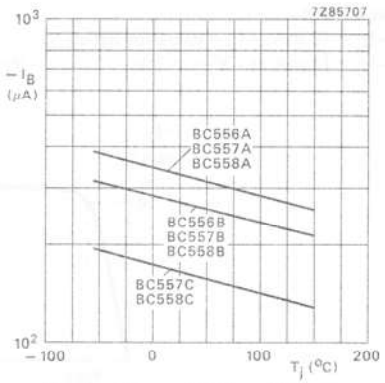


Fig. 4 $-V_{CE} = 5$ V; $I_C = 50$ mA.

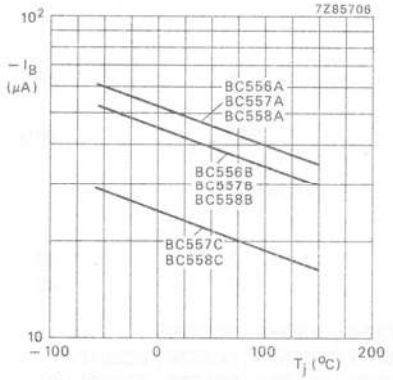


Fig. 5 $-V_{CE} = 5$ V; $I_C = 10$ mA.

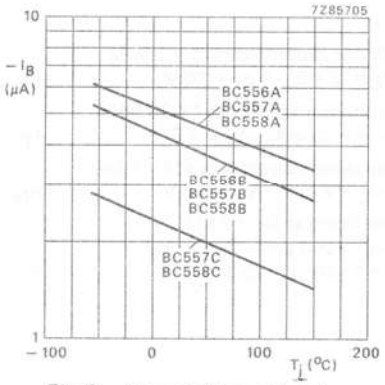


Fig. 6 $-V_{CE} = 5$ V; $I_C = 1$ mA.

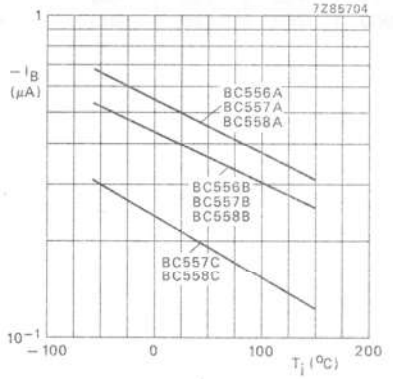


Fig. 7 $-V_{CE} = 5$ V; $I_C = 0{,}1$ mA.

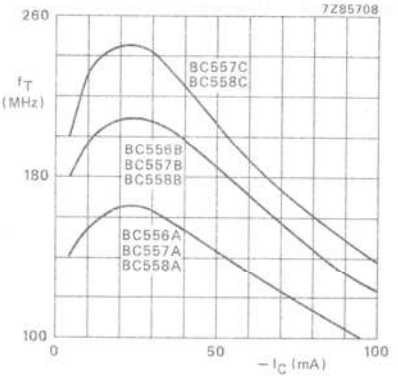


Fig. 8 $-V_{CE} = 5$ V; $T_j = 25$ °C; f = 35 MHz.

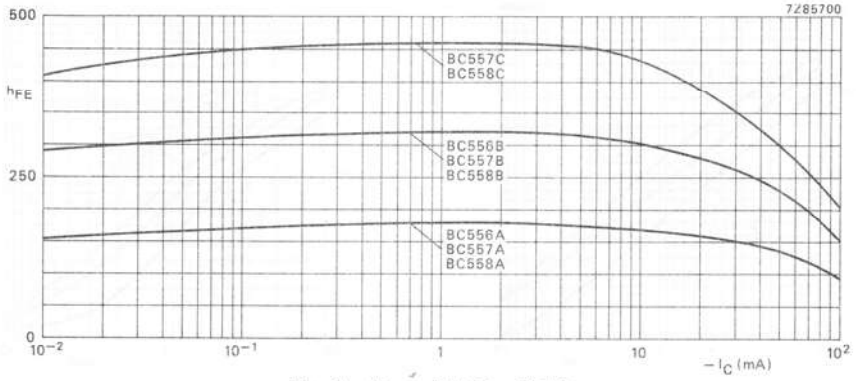


Fig. 9 $-V_{CE} = 5$ V; $T_j = 25$ °C.

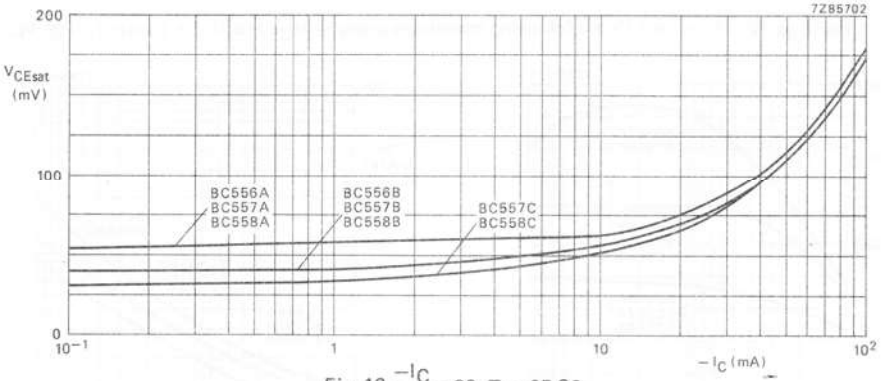


Fig. 10 $\frac{-I_C}{-I_B} = 20$; $T_j = 25$ °C.

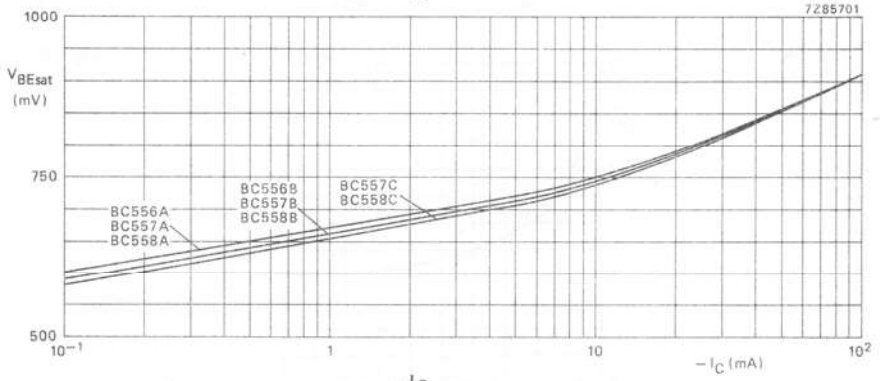


Fig. 11 $\frac{-I_C}{-I_B} = 20$; $T_j = 25$ °C.

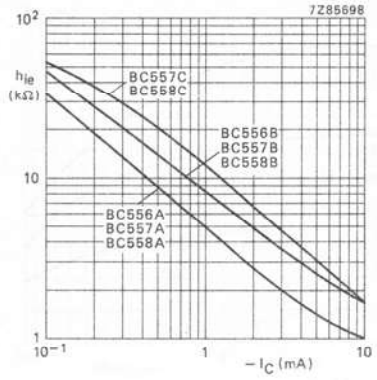


Fig. 12.

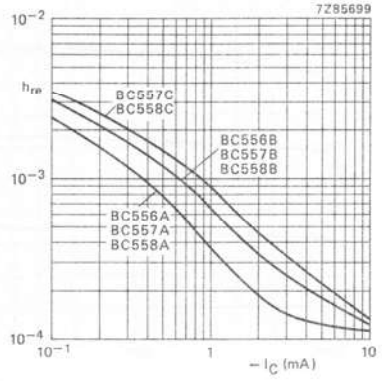


Fig. 13.

For Figs 12, 13, 14 and 15 the following conditions apply: $-V_{CE}$ = 5 V; f = 1 kHz; T_j = 25 °C.

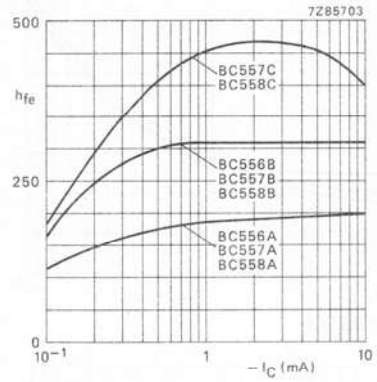


Fig. 14.

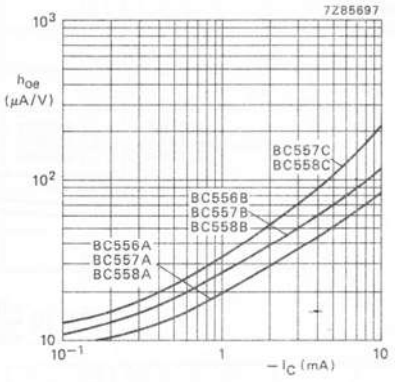


Fig. 15.

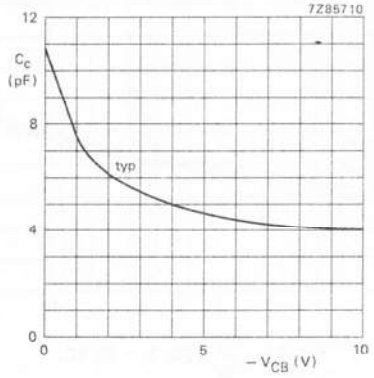


Fig. 16 f = 1 MHz; T_j = 25 °C.