

A.F. SILICON PLANAR EPITAXIAL TRANSISTORS



P-N-P transistors in TO-18 metal envelopes with the collector connected to the case.

The **BC177** is a high-voltage type and primarily intended for use in driver stages of audio amplifiers and in signal processing circuits of television receivers.

The **BC178** is suitable for a multitude of low-voltage applications e.g. driver stages or audio preamplifiers and in signal processing circuits of television receivers.

The **BC179** is primarily intended for low-noise input stages in tape recorders, hi-fi amplifiers and other audio-frequency equipment.

Moreover, they are intended as complementary types for the BC107, BC108 and BC109.

QUICK REFERENCE DATA

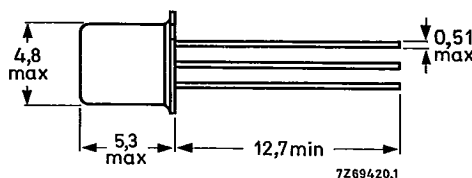
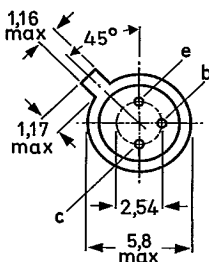
			BC177	BC178	BC179	
Collector-emitter voltage (+ $V_{BE} = 1\text{ V}$)	$-V_{CEX}$	max.	50	30	25	V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	45	25	20	V
Collector current (peak value)	$-I_{CM}$	max.	200	200	200	mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.	300	300	300	mW
Junction temperature	T_j	max.	175	175	175	$^{\circ}\text{C}$
Small-signal current gain at $T_j = 25\text{ }^{\circ}\text{C}$ $-I_C = 2\text{ mA}$; $-V_{CE} = 5\text{ V}$; $f = 1\text{ kHz}$	h_{fe}	$>$ $<$	125 500	125 500	125 500	
Transition frequency at $f = 35\text{ MHz}$ $-I_C = 10\text{ mA}$; $-V_{CE} = 5\text{ V}$	f_T	typ.	150	150	150	MHz
Noise figure at $R_S = 2\text{ k}\Omega$ $-I_C = 200\text{ }\mu\text{A}$; $-V_{CE} = 5\text{ V}$ $f = 30\text{ Hz}$ to 15 kHz	F	typ. $<$	— —	— —	1,2 4,0	dB
$f = 1\text{ kHz}$; $B = 200\text{ Hz}$	F	$<$	10	10	4,0	dB

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-18.

Collector
connected
to case



7269420.1

Accessories: 56246 (distance disc).

Qualification approved to CECC 50 002-012/013/014

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RATINGS

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

			BC177	BC178	BC179
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	50	30	25 V
Collector-emitter voltage (+ $V_{BE} = 1$ V)	$-V_{CEX}$	max.	50	30	25 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	45	25	20 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
Total power dissipation up to $T_{amb} = 25$ °C	P_{tot}	max.	300		mW
Storage temperature range	T_{stg}		-65 to + 150		°C
Junction temperature	T_j	max.	175		°C

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th j-a}$	=	0,5	K/mW
From junction to case	$R_{th j-c}$	=	0,2	K/mW

CHARACTERISTICS

 $T_j = 25$ °C unless otherwise specified

Collector cut-off current $I_E = 0$; $-V_{CB} = 20$ V	$-I_{CBO}$	typ.	1	nA
		<	100	nA
$T_j = 150$ °C	$-I_{CBO}$	<	10	μ A
Base-emitter voltage* $-I_C = 2$ mA; $-V_{CE} = 5$ V	$-V_{BE}$	typ.	650	mV
			600 to 750	mV
Saturation voltages $-I_C = 10$ mA; $-I_B = 0,5$ mA	$-V_{CEsat}$	typ.	75	mV
		<	300	mV
	$-V_{BEsat}$	typ.	700	mV
$-I_C = 100$ mA; $-I_B = 5$ mA	$-V_{CEsat}$	typ.	250	mV
	$-V_{BEsat}$	typ.	850	mV
Collector capacitance at $f = 1$ MHz $I_E = I_e = 0$; $-V_{CB} = 10$ V	C_c	typ.	4,0	pF
Transition frequency at $f = 35$ MHz $-I_C = 10$ mA; $-V_{CE} = 5$ V	f_T	typ.	150	MHz

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

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Noise figure at $R_S = 2 \text{ k}\Omega$ $-I_C = 200 \mu\text{A}; -V_{CE} = 5 \text{ V}$ $f = 30 \text{ Hz to } 15 \text{ kHz}$

F

typ.
<

BC177

BC178

BC179

1,2 dB

4 dB

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

F

typ.
<2
102
101 dB
4 dB

D.C. current gain

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

typ.

BC177
BC178BC177A
BC178A
BC179ABC177B
BC178B
BC179B

140

180

290

Small signal current gain at $f = 1 \text{ kHz}$ $-I_C = 2 \text{ mA}; -V_{CE} = 5 \text{ V}$ h_{fe} >
<125
500125
500125
500

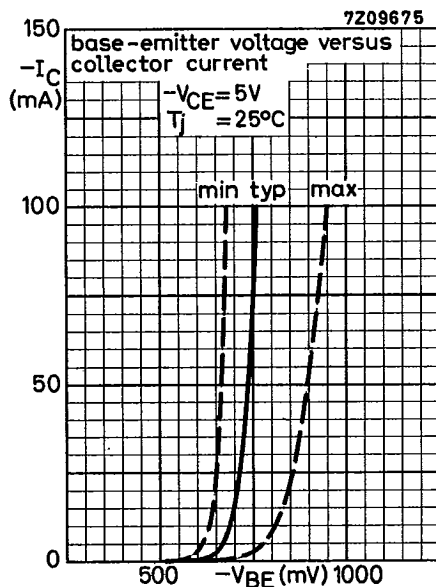


Fig. 2.

Typical behaviour of collector current versus collector-emitter voltage

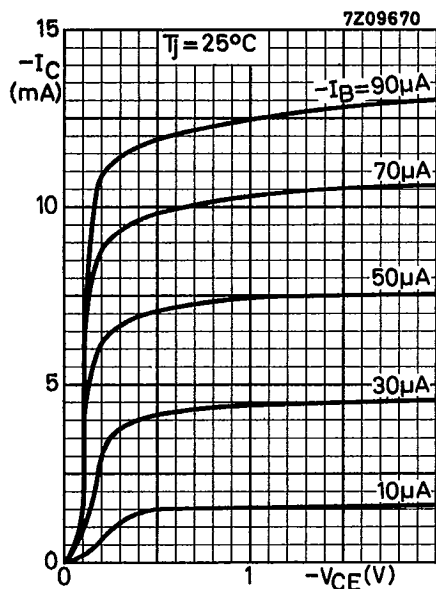


Fig. 3.

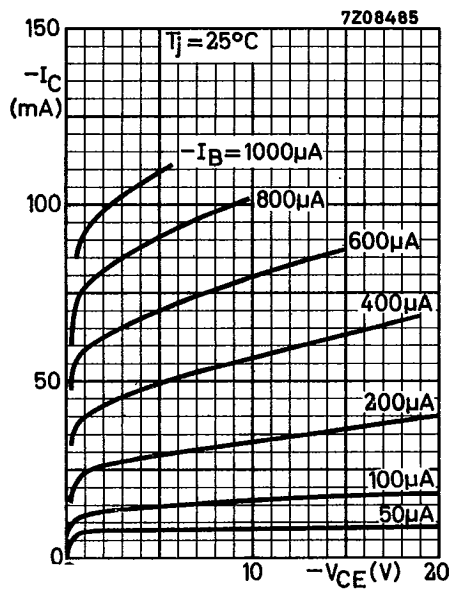


Fig. 4.

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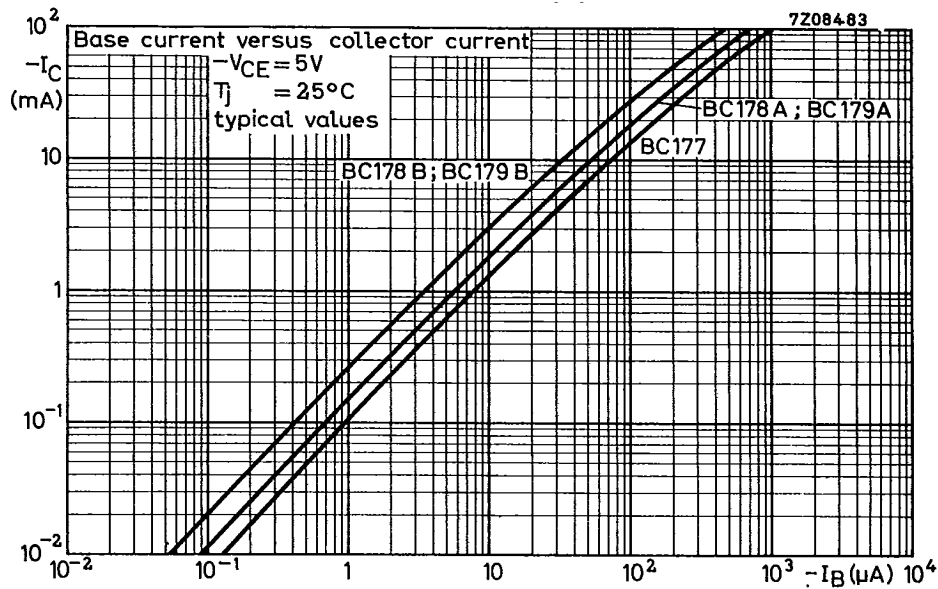


Fig. 5.

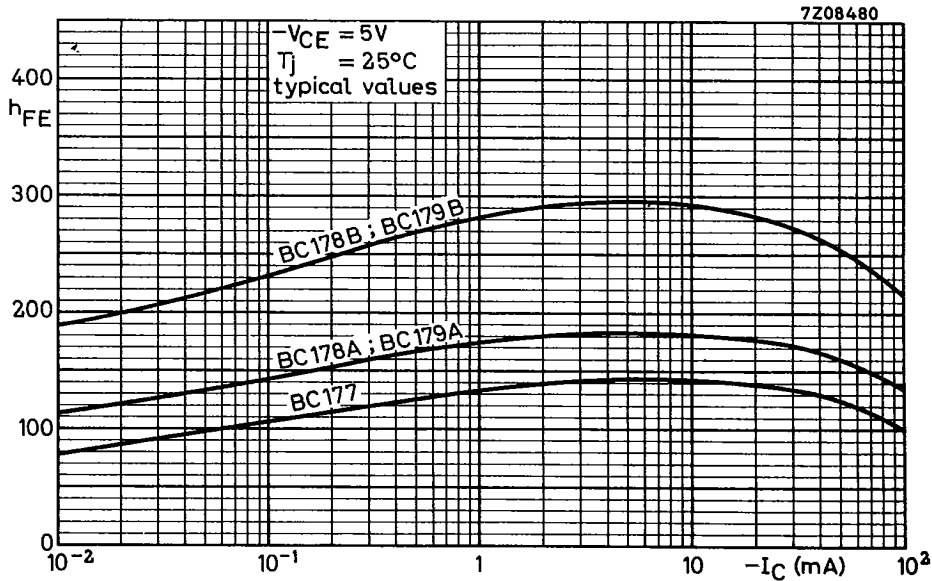


Fig. 6.

BC177 to 179

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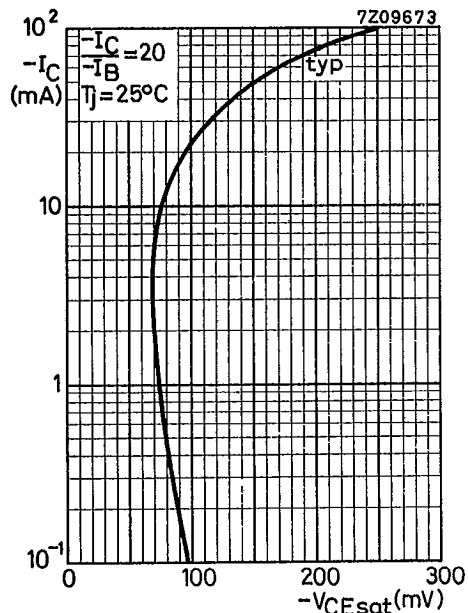


Fig. 7.

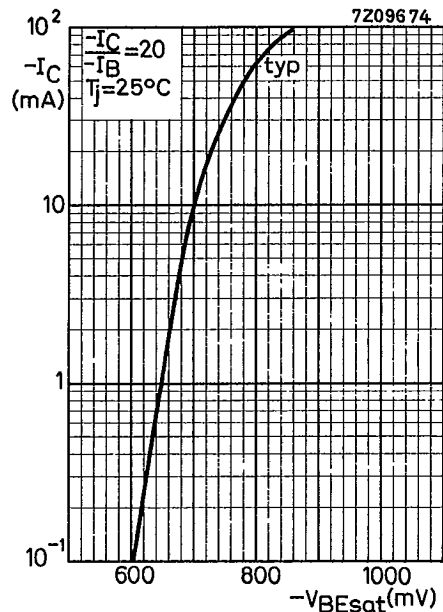


Fig. 8.

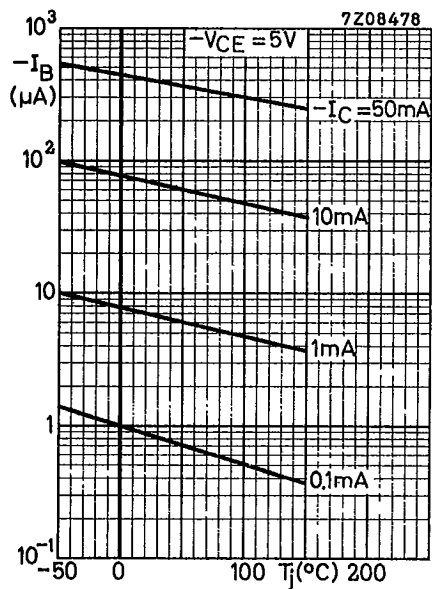


Fig. 9.

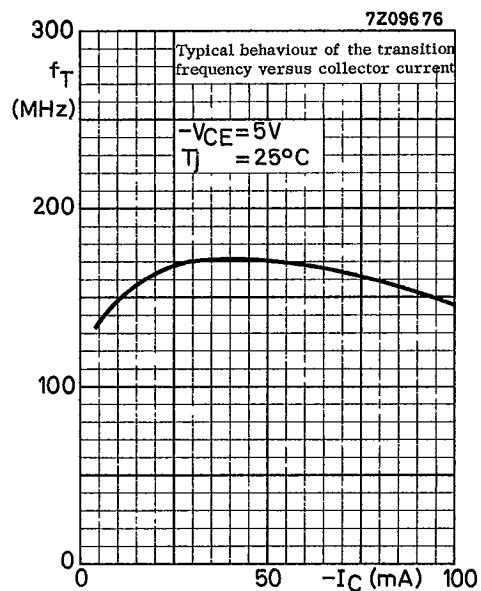


Fig. 10.

Typical behaviour of base current versus junction temperature.

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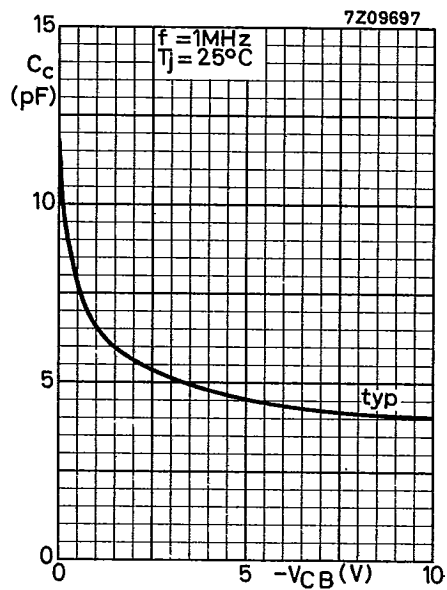


Fig. 11.

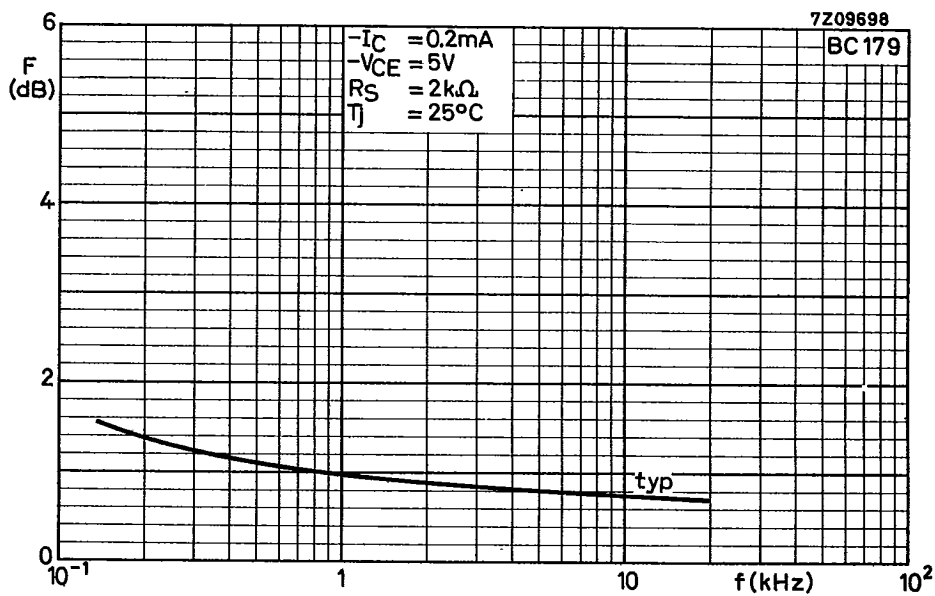


Fig. 12.

Curves of constant noise figure

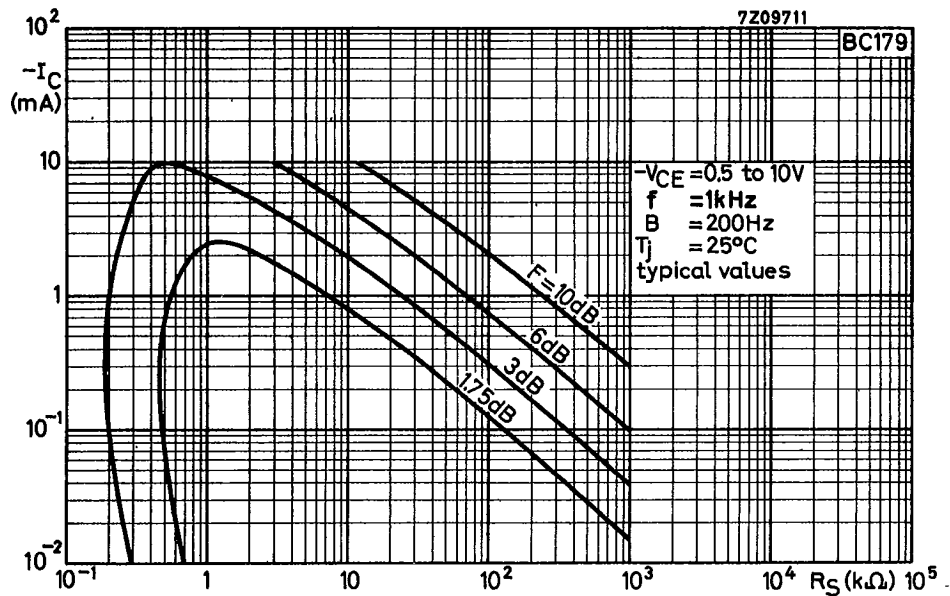


Fig. 13.

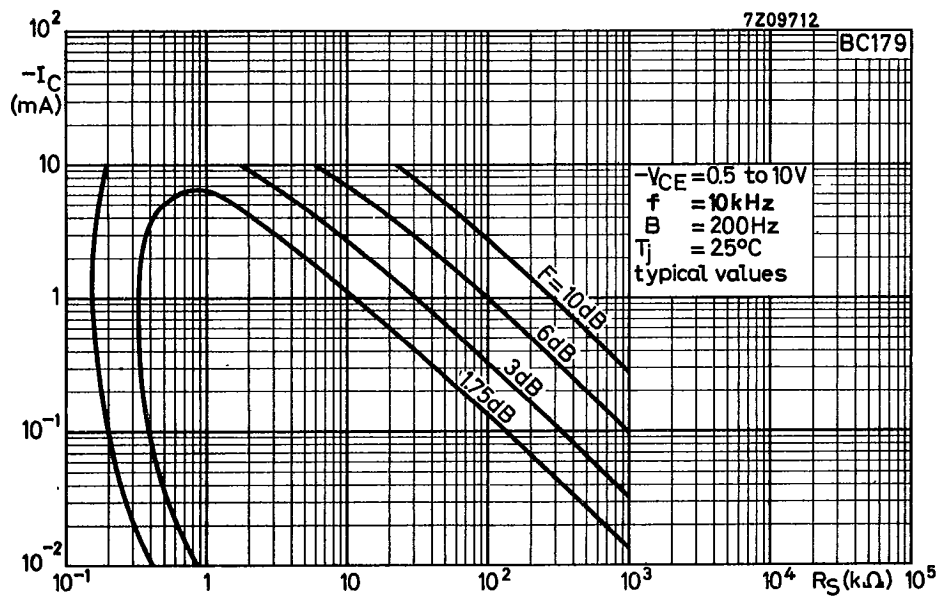


Fig. 14.

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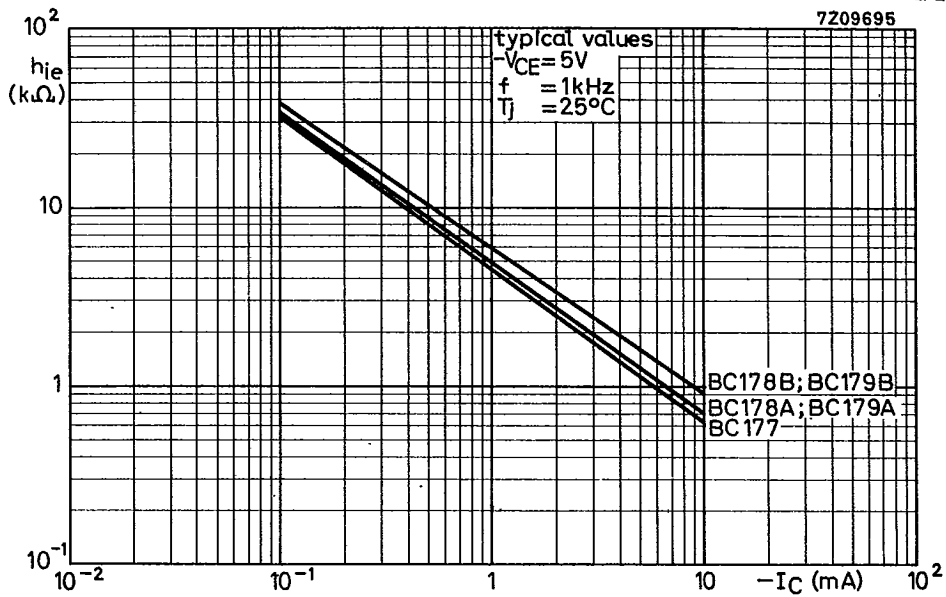


Fig. 15.

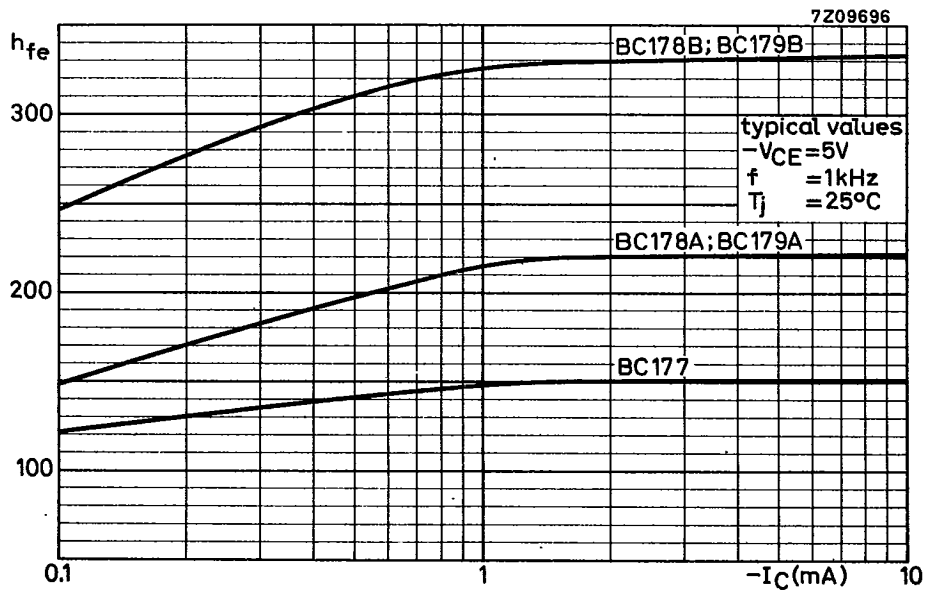


Fig. 16.

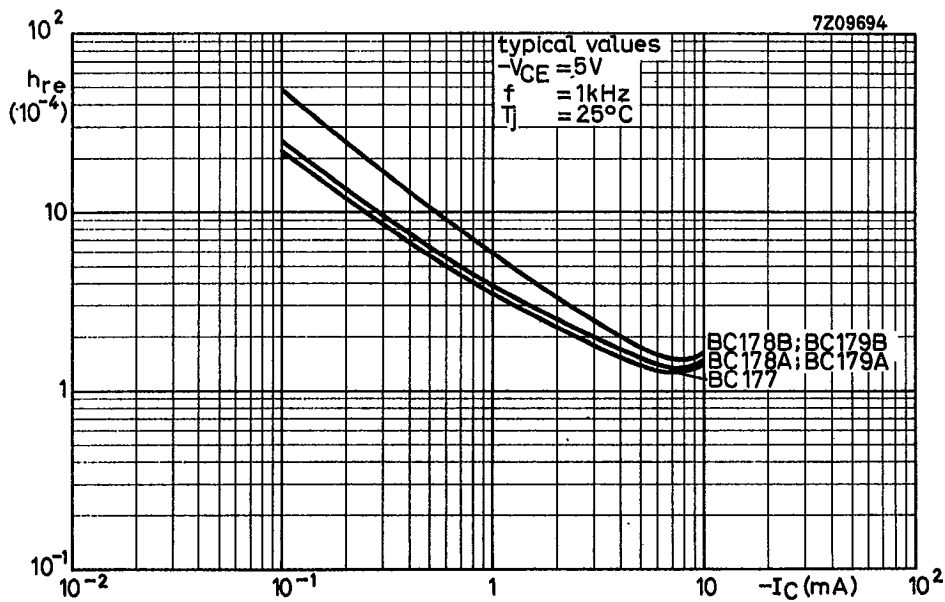


Fig. 17.

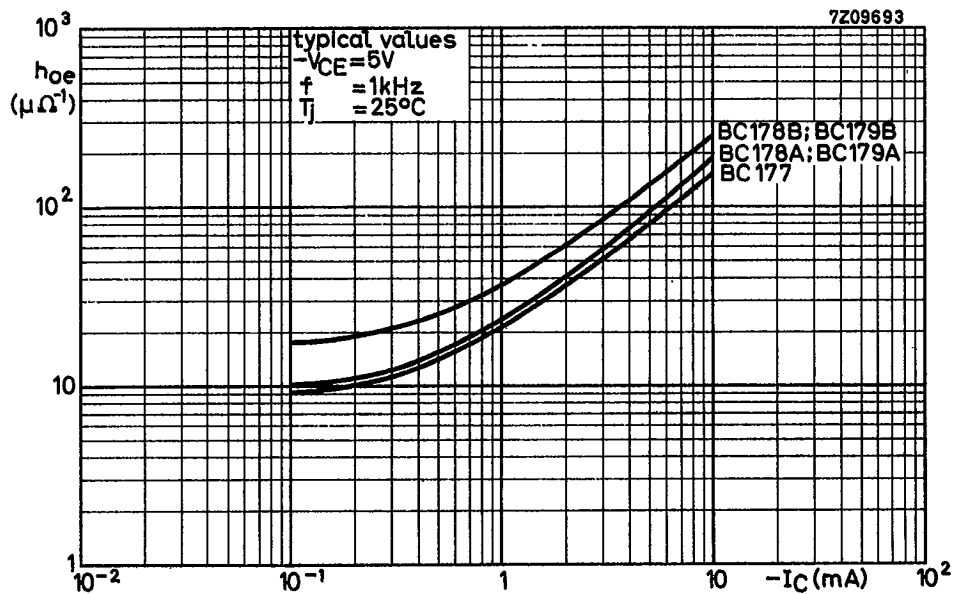


Fig. 18.

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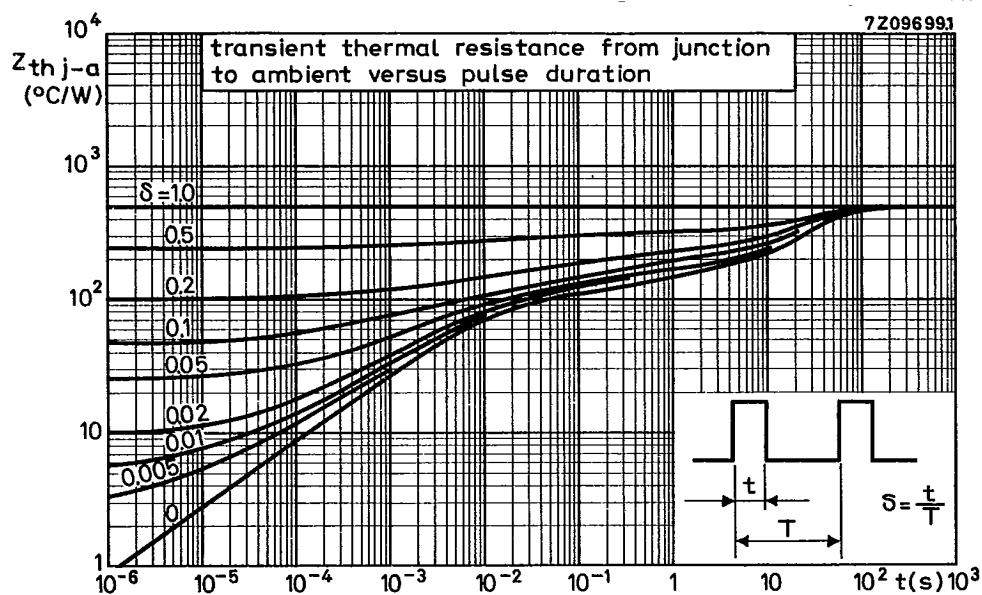


Fig. 19.