

P-N-P SILICON PLANAR EPITAXIAL TRANSISTORS

BC157
BC158
BC159

P-N-P silicon planar epitaxial transistors in plastic encapsulation with three rigid self-locking strips suitable for insertion in printed circuit boards using standard grids.

The BC157 is primarily intended for use in audio driver stages and television signal processing circuits.

The BC158 is a general purpose l.f. transistor.

The BC159 is primarily intended for low noise audio input stages.

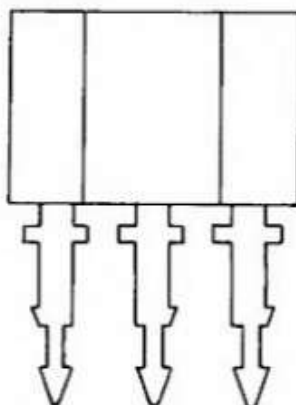
QUICK REFERENCE DATA

	BC157	BC158	BC159	
$-V_{CEX}$ max. ($+V_{BE} = 1V$)	50	30	25	V
$-V_{CEO}$ max.	45	25	20	V
$-I_{CM}$ max.	200	200	200	mA
P_{tot} max. ($T_{amb} \leq 25^{\circ}C$)	350	350	350	mW
T_j max.	125	125	125	$^{\circ}C$
h_{fe} ($-I_C = 2mA$, $-V_{CE} = 5V$, $f = 1kHz$) min.	75	75	125	
max.	260	500	500	
f_T typ. ($-I_C = 10mA$, $-V_{CE} = 5V$, $f = 35MHz$)	150	150	150	MHz
N ($-I_C = 200\mu A$, $-V_{CE} = 5V$, $R_S = 2k\Omega$)				
$f = 30Hz$ to $15kHz$ typ.	-	-	1.2	dB
max.	-	-	4.0	dB
$f = 1kHz$, $B = 200Hz$ max.	10	10	4.0	dB

Unless otherwise stated data are applicable to all types

OUTLINE AND DIMENSIONS

For details see page 5



Front View
Scale 3:1

D5542

N.B. Devices in this Data Sheet should be ordered by the type number followed by Reference 0220.

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RATINGS

Limiting values of operation according to the absolute maximum system.

Electrical

	BC157	BC158	BC159	
$-V_{CBO}$ max.	50	30	25	V
$-V_{CEX}$ max. ($+V_{BE} = 1V$)	50	30	25	V
$-V_{CEO}$ max.	45	25	20	V
$-V_{EBO}$ max.	5.0	5.0	5.0	V
$-I_C$ max.	100	100	100	mA
$-I_{CM}$ max.	200	200	200	mA
I_{EM} max.	200	200	200	mA
$-I_{BM}$ max.	200	200	200	mA
P_{tot} max. ($T_{amb} \leq 25^\circ C$)	350	350	350	mW

Temperature

T_{stg} range	-65 to +125	$^\circ C$
T_j max.	125	$^\circ C$

THERMAL CHARACTERISTICS

$R_{th}(j-amb)$	0.275	$^\circ C/mW$
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ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ C$ unless otherwise stated)

		Min.	Typ.	Max.	
$-I_{CBO}$	Collector cut-off current $I_E = 0, -V_{CB} = 20V$	-	2.0	100	nA
	$I_E = 0, -V_{CB} = 20V, T_j = 125^\circ C$	-	-	5.0	μA
$-V_{BE}$	*Base-emitter voltage $-I_C = 2mA, -V_{CE} = 5V$	600	650	750	mV
$-V_{CE}(sat)$	Collector-emitter saturation voltage $-I_C = 10mA, -I_B = 0.5mA$	-	75	300	mV
	$-I_C = 100mA, -I_B = 5mA$	-	250	-	mV
$-V_{BE}(sat)$	Base-emitter saturation voltage $-I_C = 10mA, -I_B = 0.5mA$	-	700	-	mV
	$-I_C = 100mA, -I_B = 5mA$	-	850	-	mV

* $-V_{BE}$ decreases by about $2mV/^\circ C$ with increasing temperature

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BC158
BC159

ELECTRICAL CHARACTERISTICS (cont'd)

		Min.	Typ.	Max.
$-V_{CEK}$	Collector knee voltage (see Fig. 1) $-I_C = 10\text{mA}$, $-I_B$ = the value for which $-I_C = 11\text{mA}$ at $-V_{CE} = 1\text{V}$	-	250	600 mV

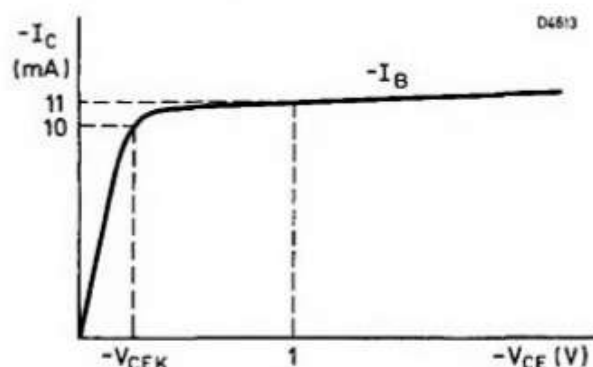


Fig. 1

h_{FE}	Static forward current transfer ratio $-I_C = 2\text{mA}$, $-V_{CE} = 5\text{V}$	BC157	-	140	-
		BC158	-	210	-
		BC159	-	230	-
h_{fe}	Small signal forward current transfer ratio $-I_C = 2\text{mA}$, $-V_{CE} = 5\text{V}$, $f = 1\text{kHz}$	BC157	75	-	260
		BC158	75	-	500
		BC159	125	-	500
f_T	Transition frequency $-I_C = 10\text{mA}$, $-V_{CE} = 5\text{V}$, $f = 35\text{MHz}$		-	150	- MHz
C_{Tc}	Collector capacitance $I_E = I_e = 0$, $-V_{CB} = 10\text{V}$, $f = 1\text{MHz}$		-	4.5	- pF
N	Noise figure $-I_C = 200\mu\text{A}$, $-V_{CE} = 5\text{V}$, $R_S = 2\text{k}\Omega$				
	$f = 30\text{Hz}$ to 15kHz	BC159	-	1.2	4.0 dB
	$f = 1\text{kHz}$, $B = 200\text{Hz}$	BC157, 158	-	-	10 dB
		BC159	-	1.0	4.0 dB

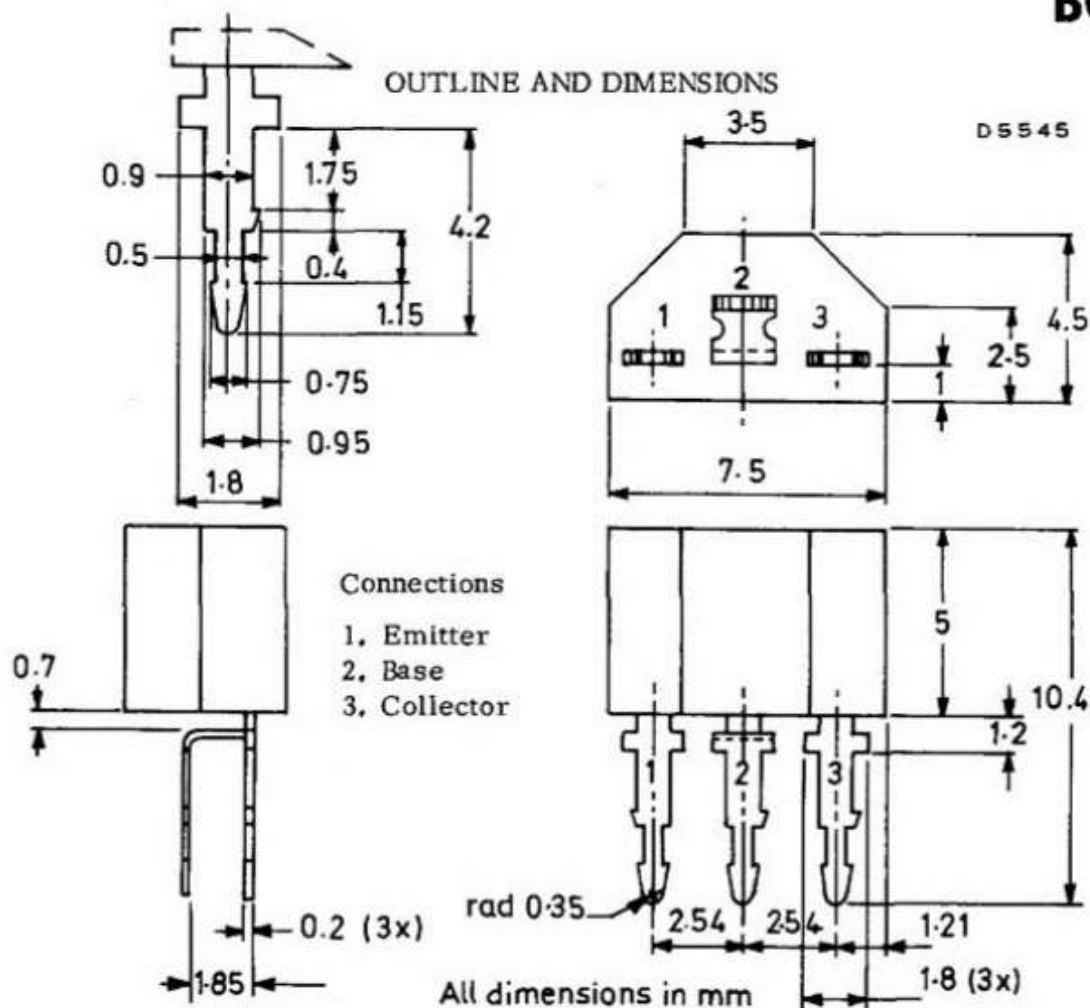
ELECTRICAL CHARACTERISTICS (cont'd)

The following supplementary gain groups are available on request:

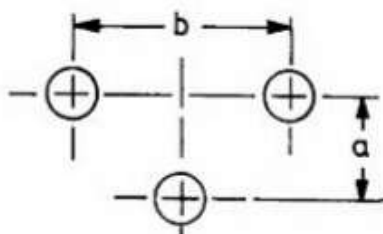
		BC157	BC158A	BC158B	
			BC159A	BC159B	
h_{FE}	Static forward current transfer ratio $-I_C = 2\text{mA}, -V_{CE} = 5\text{V}$	typ.	140	180	290
h_{fe}	Small signal forward current transfer ratio				
	$-I_C = 2\text{mA}, -V_{CE} = 5\text{V},$	min.	75	125	240
	$f = 1\text{kHz}$	max.	260	260	500

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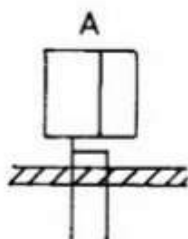


Mounting details



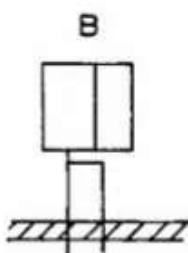
$a = 2.49$ to 2.59 mm

$b = 5.03$ to 5.13 mm



Maximum thickness of
printed board = 1.7mm

Recommended hole
diameter = 1.0 to 1.1mm
(1.0 to 1.3mm allowable)

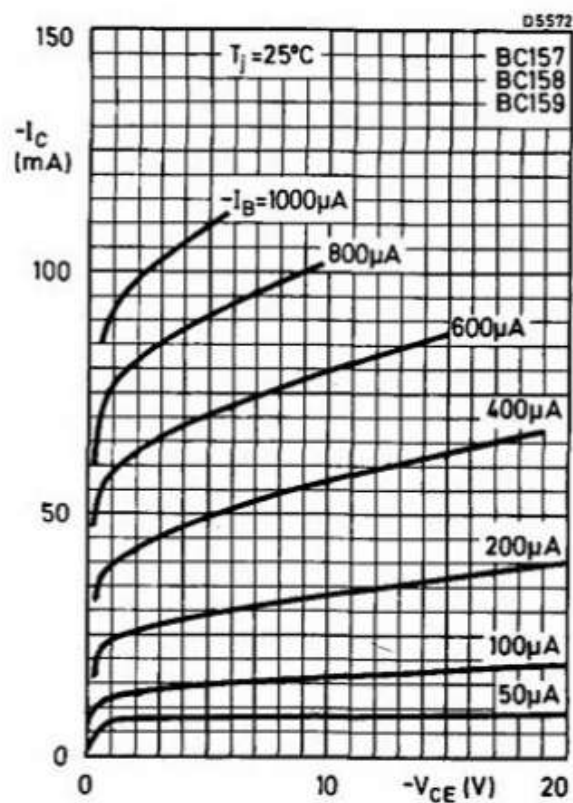
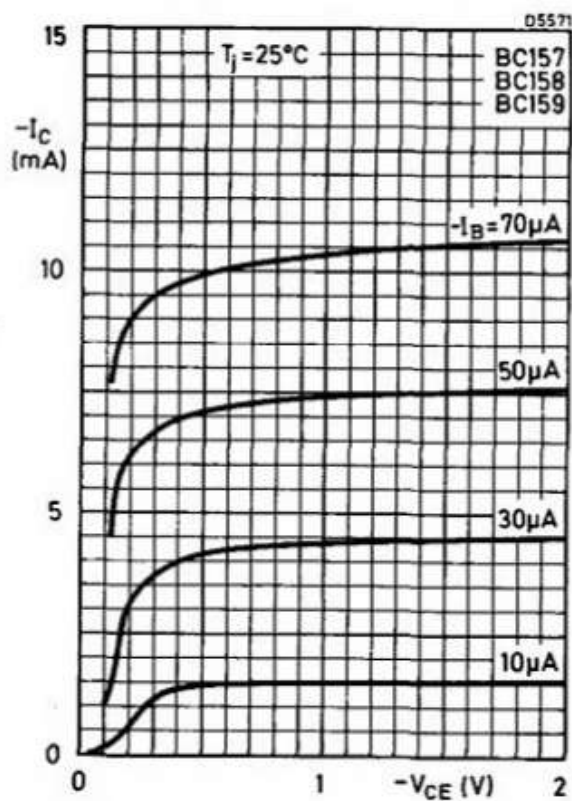
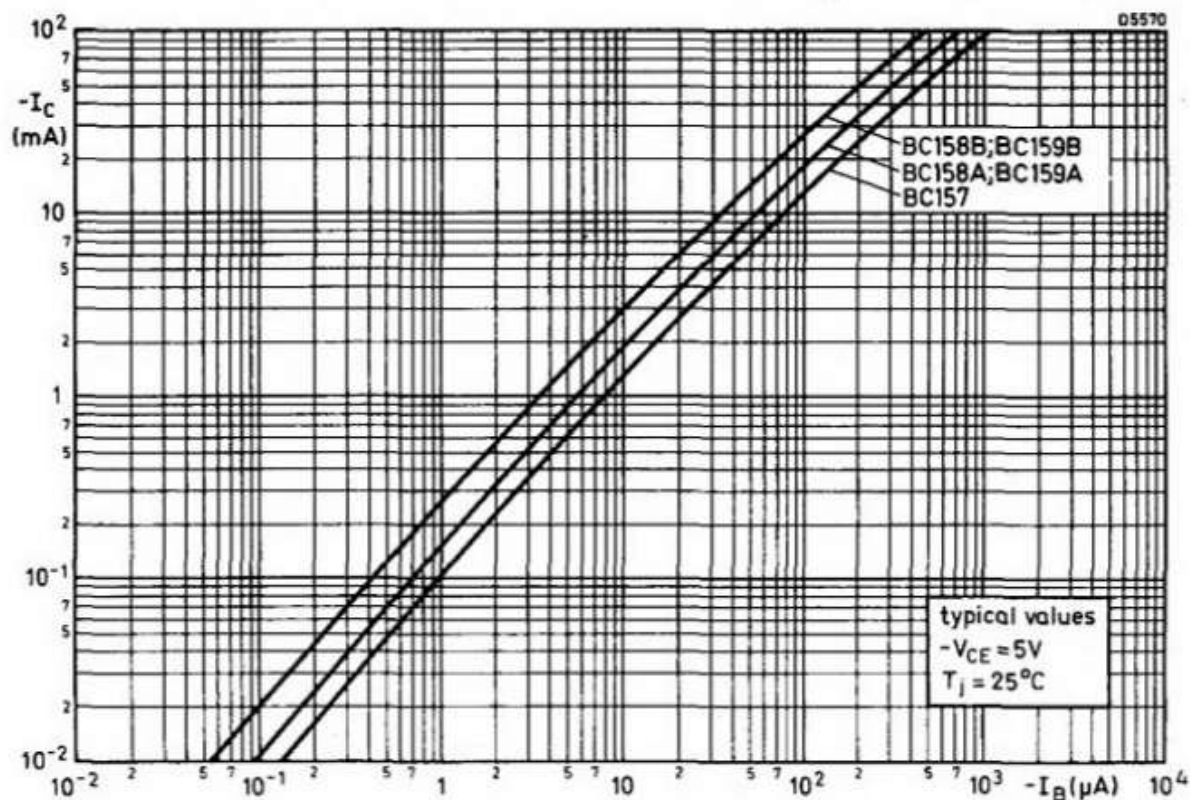


Maximum thickness of
printed board = 1.1mm

Hole diameter = 0.77 to 0.83mm

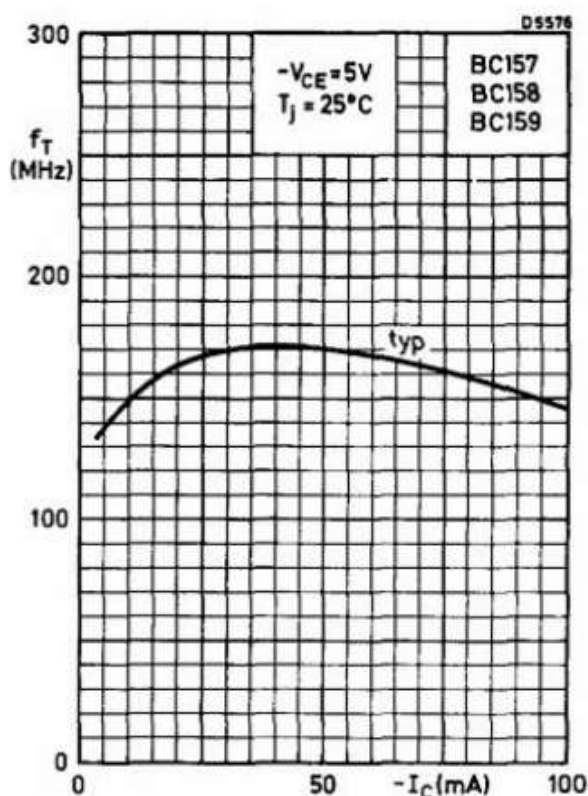
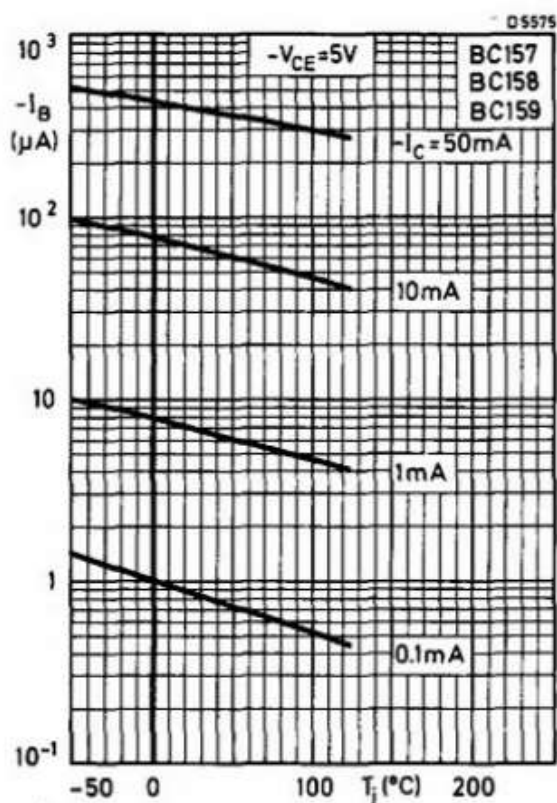
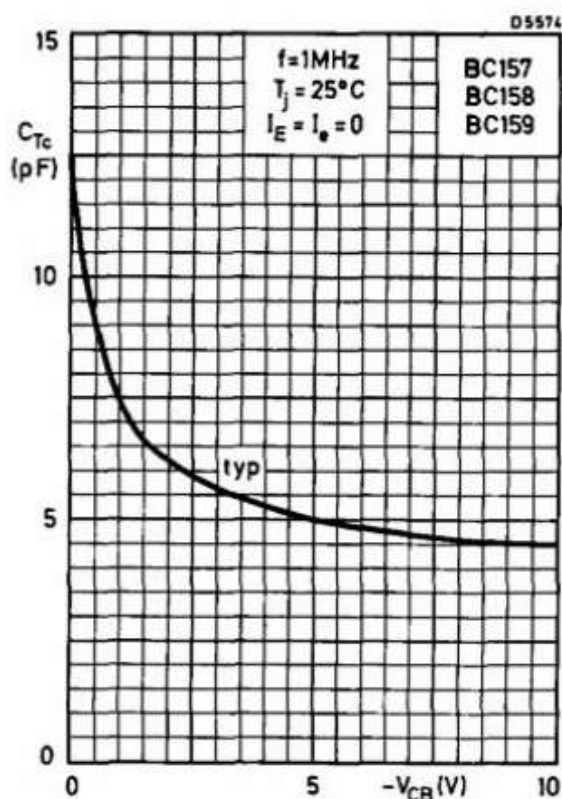
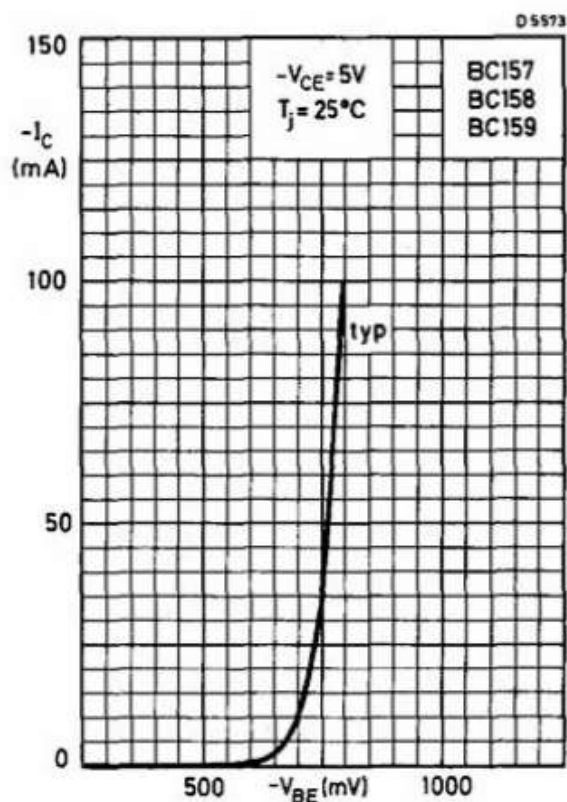
See also General Explanatory Notes Section IV.

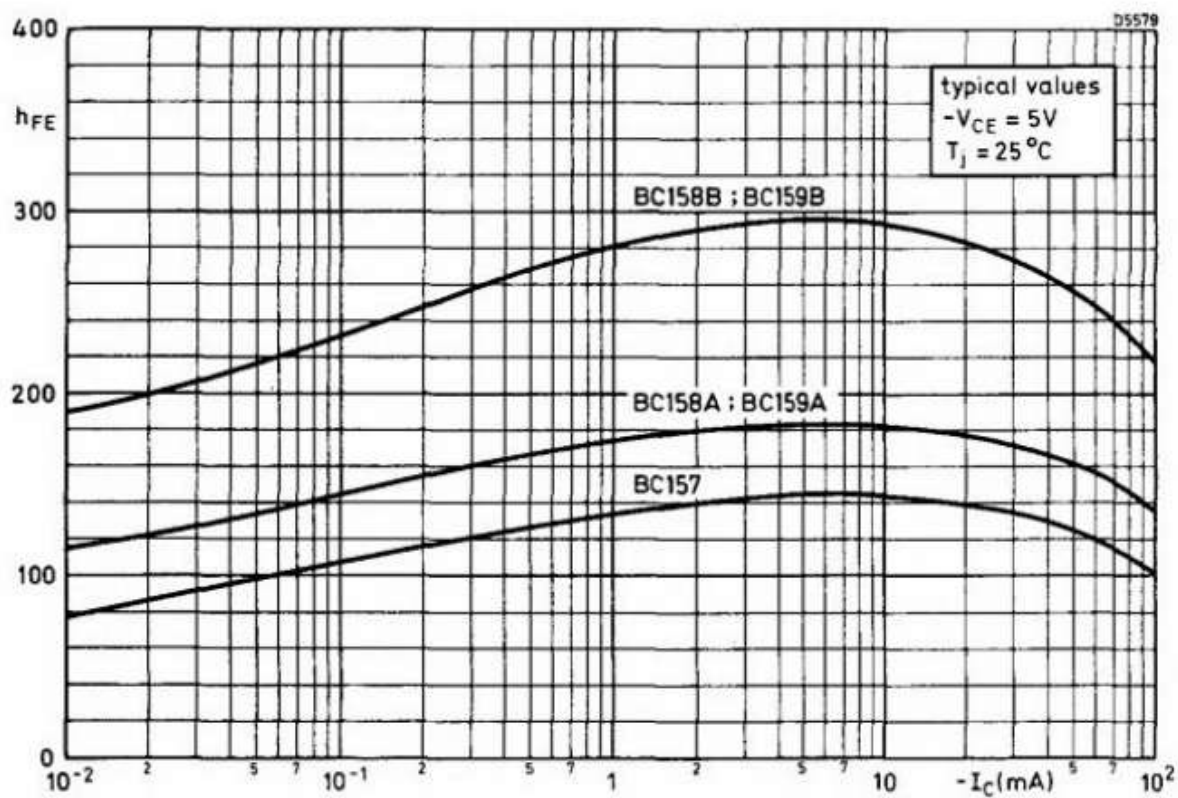
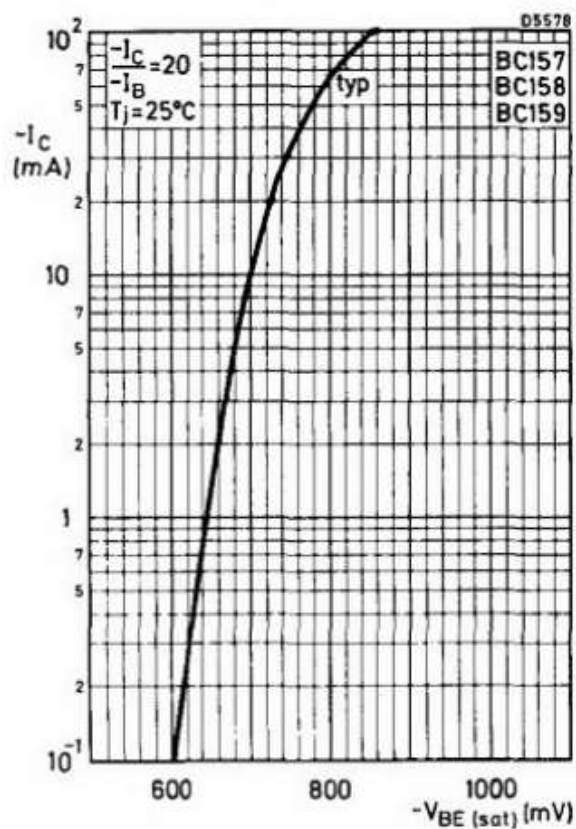
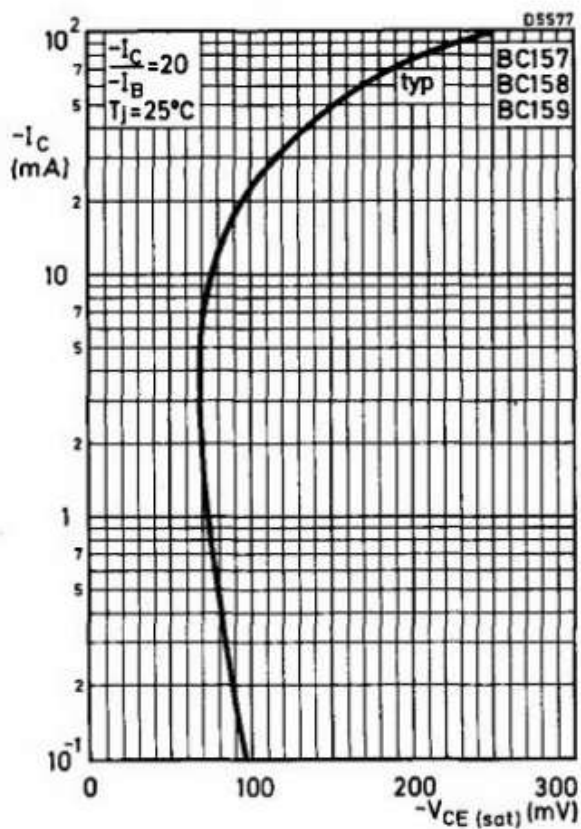
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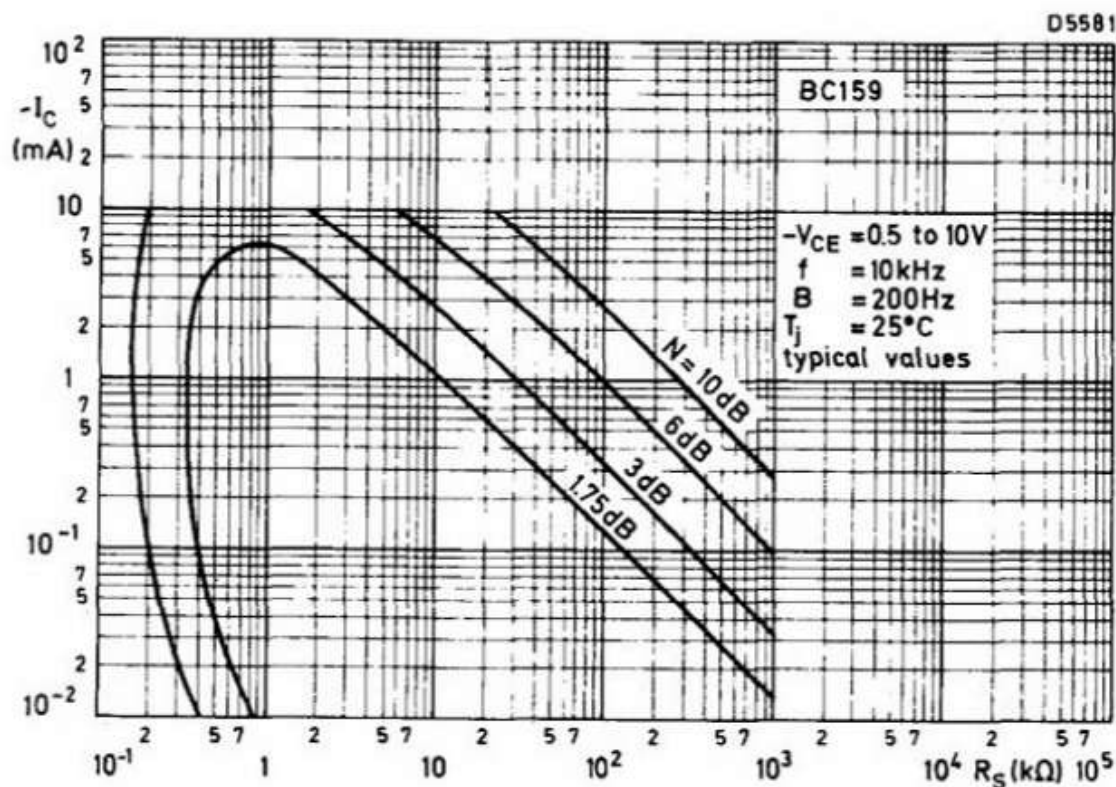
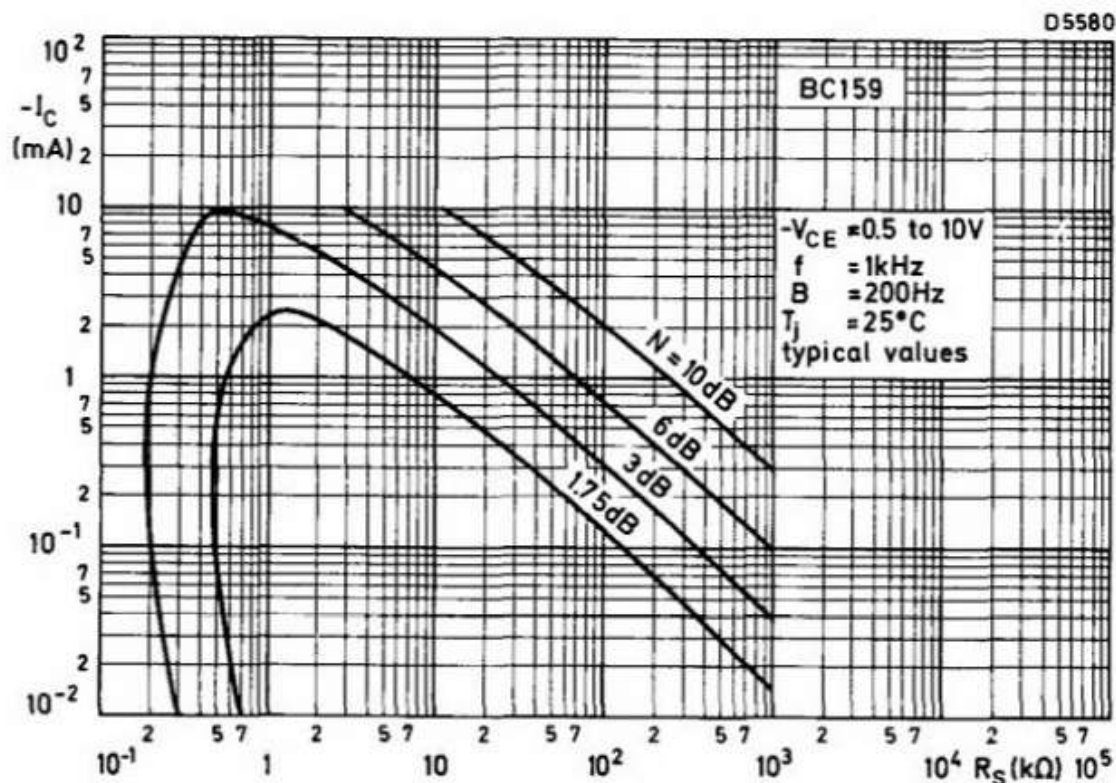


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TYPICAL CURVES OF CONSTANT NOISE FIGURE

