GERMANIUM P-N-P HIGH-GAIN TRANSISTOR

AC128
2-AC128

The AC128 is a high-gain germanium alloy junction transistor intended for operation in class A and class B output stages. 2-AC128 consists of two AC128 transistors which are matched to operate in a low distortion class B circuit. The transistors are in TO-1 construction with the envelope isolated.

QUICK REFERENCE DATA

V_{CB} max. ($I_E = 0$)	−32	V
V_{CE} max. ($R_B \leqslant 400\Omega$)	−32	V
I_{CM} max.	1.0	A
P_{tot} max.	700	mW
h_{FE} ($I_E = 300$mA, $V_{CB} = 0$)	60 to 175	
f_T typ. ($I_E = 10$mA, $V_{CB} = -2.0$V)	1.5	Mc/s

RATINGS

Limiting values of operation according to the absolute maximum system as defined in publication 134 of the International Electrotechnical Commission.

Electrical

V_{CB} max. ($I_E = 0$)	−32	V
V_{CE} max. (see curve on page C1)	−32	V
V_{EB} max. ($I_C = 0$)	−10	V
I_{CM} max.	1.0	A
$I_{C(AV)}$ max.*	1.0	A
I_{BM} max.	40	mA
$I_{B(AV)}$ max.*	40	mA
P_{tot} max.	700	mW

*Maximum averaging time = 20ms.

Thermal

T_{stg} max.	75	°C
T_{stg} min.	−55	°C
T_j max. (continuous operation)	90	°C
T_j max. (intermittent operation, total duration = 200 hours)	100	°C

THERMAL CHARACTERISTICS

Maximum thermal resistance from junction to ambient in free air		0.29 deg C/mW
in free air with cooling clip as shown on page D4		0.14 deg C/mW
in free air with cooling clip giving good thermal contact, mounted on a heatsink of 16 s.w.g. aluminium, minimum area 12.5cm^2		0.08 deg C/mW
Maximum thermal resistance from junction to case	θ_{j-case}	0.04 deg C/mW

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C unless otherwise stated)

		Min.	*Typ.*	*Max.*	
Collector-base cut-off current	I_{CBO}				
V_{CB} = –10V, I_E = 0		—	—	10	μA
Emitter-base cut-off current	I_{EBO}				
V_{EB} = –5.0V, I_C = 0, T_j = 75°C		—	—	500	μA
Collector-base breakdown voltage	$V_{(BR)CBO}$				
I_C = 200μA, I_E = 0		–32	—	—	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$				
I_E = 200μA, I_C = 0		–10	—	—	V
Large signal forward current transfer ratio	h_{FE}				
I_E = 50mA, V_{CB} = 0		55	90	175	
I_E = 300mA, V_{CB} = 0		60	90	175	
I_E = 1.0A, V_{CB} = 0		45	80	165	
Collector knee voltage	$V_{CE(knee)}$				
I_C = 1.0A (See Fig. 1)				–600	mV

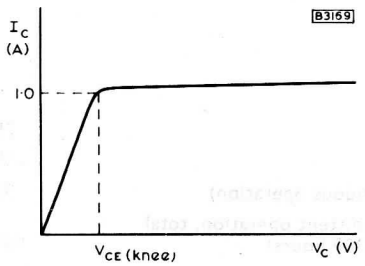

Fig 1.

GERMANIUM P-N-P HIGH-GAIN TRANSISTOR

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		Min.	Typ.	Max.	
Base-emitter voltage	V_{BE}				
$I_E = 50mA, V_{CB} = 0$		—	—	–300	mV
$I_E = 300mA, V_{CB} = 0$		—	—	–450	mV
Transition frequency	f_T				
$I_E = 10mA, V_{CB} = -2.0V$		1.0	1.5	—	Mc/s
Intrinsic base resistance	$r_{bb'}$				
$I_E = 1.0mA, V_{CB} = -5.0V$		—	25	—	Ω
Collector depletion capacitance	c_{tc}				
$V_{CB} = -5.0V, I_E = 0$		—	100	—	pF
Small signal loaded common emitter forward current transfer ratio linearity $\frac{(A_i \text{ at } I_C = 500mA)}{A_i \text{ max.}}$ $V_{CC} = -10V, R_L = 16\Omega$. See curve B on page C8		0.50	0.60	—	

ELECTRICAL CHARACTERISTICS OF MATCHED PAIRS

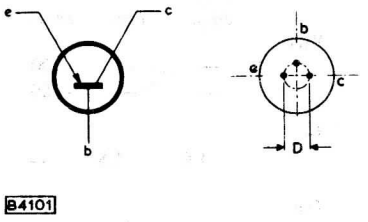
Ratio of large signal forward current transfer ratios of the two transistors $\frac{h_{FE1}}{h_{FE2}}$				
$I_E = 50mA, V_{CB} = 0$	—	1.1	1.25	
$I_E = 300mA, V_{CB} = 0$	—	1.1	1.25	

SOLDERING AND WIRING RECOMMENDATIONS

1. Transistors may be soldered into the circuit but heat conducted to the junction should be kept to a minimum by the use of a thermal shunt.
2. Transistors may be dip soldered at a solder temperature of 245°C for a maximum soldering time of 5 seconds. The temperature of the envelope in contact with the board must not exceed 115°C. for two minutes. These recommendations apply to a transistor mounted flush on board with punched-through holes or spaced 1.5mm above a board with plated-through holes.
3. Care should be taken not to bend the leads nearer than 1.5mm to the seal.

OUTLINE

Conforms to J.E.D.E.C. TO-1
V.A.S.C.A. SO-21/SB3-10



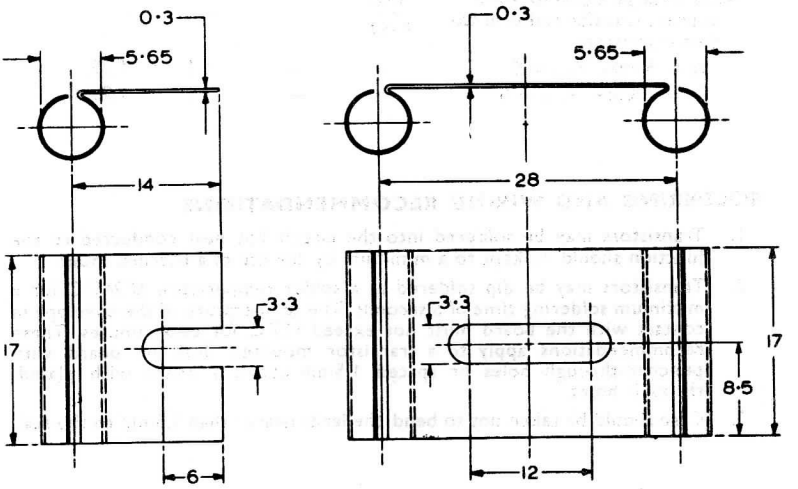
B4101

The envelope is isolated.

DIMENSIONS (in millimetres)

	Min.	*Nom.*	*Max.*
A	—	—	6.48
B	—	—	6.1
C	—	—	9.4
D	—	1.8	—
E	—	—	1.5
F	38	—	—
G	—	—	0.48

OUTLINE AND DIMENSIONS OF COOLING CLIPS



Nominal dimensions in mm

B3121

Type a.
Part No. 56227

Type b.
Part No. 56226

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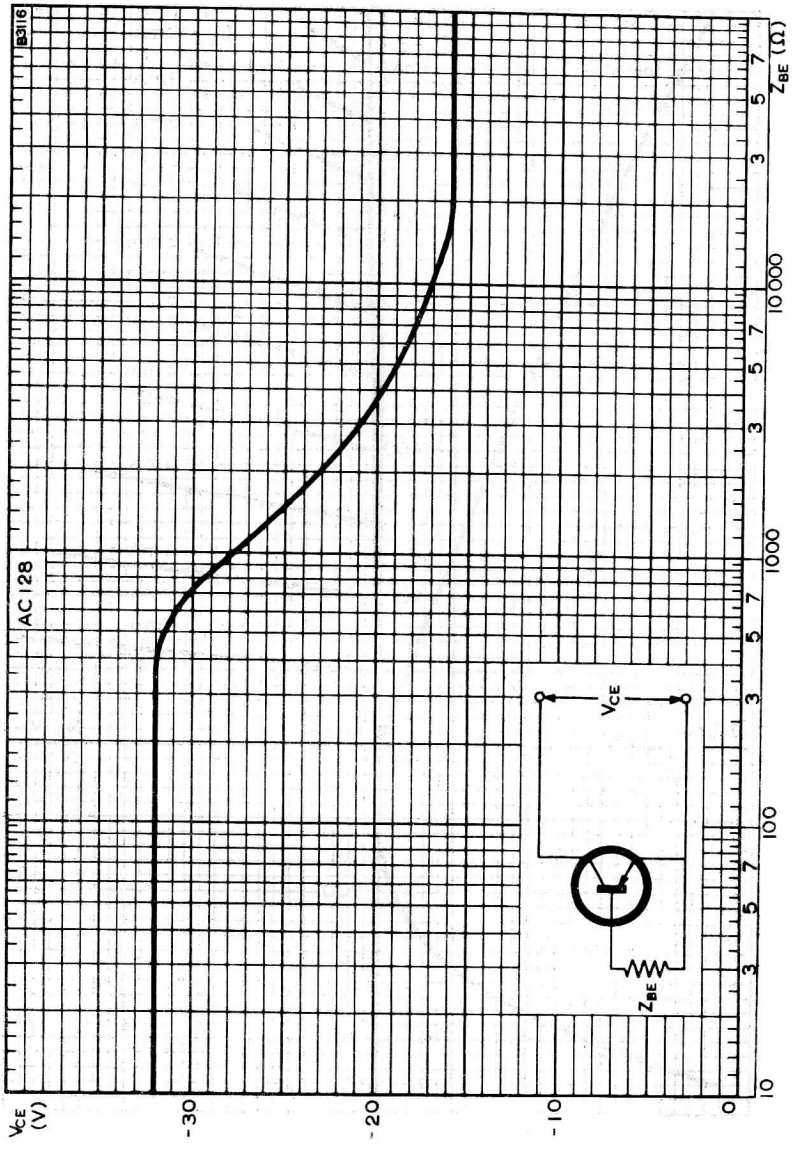
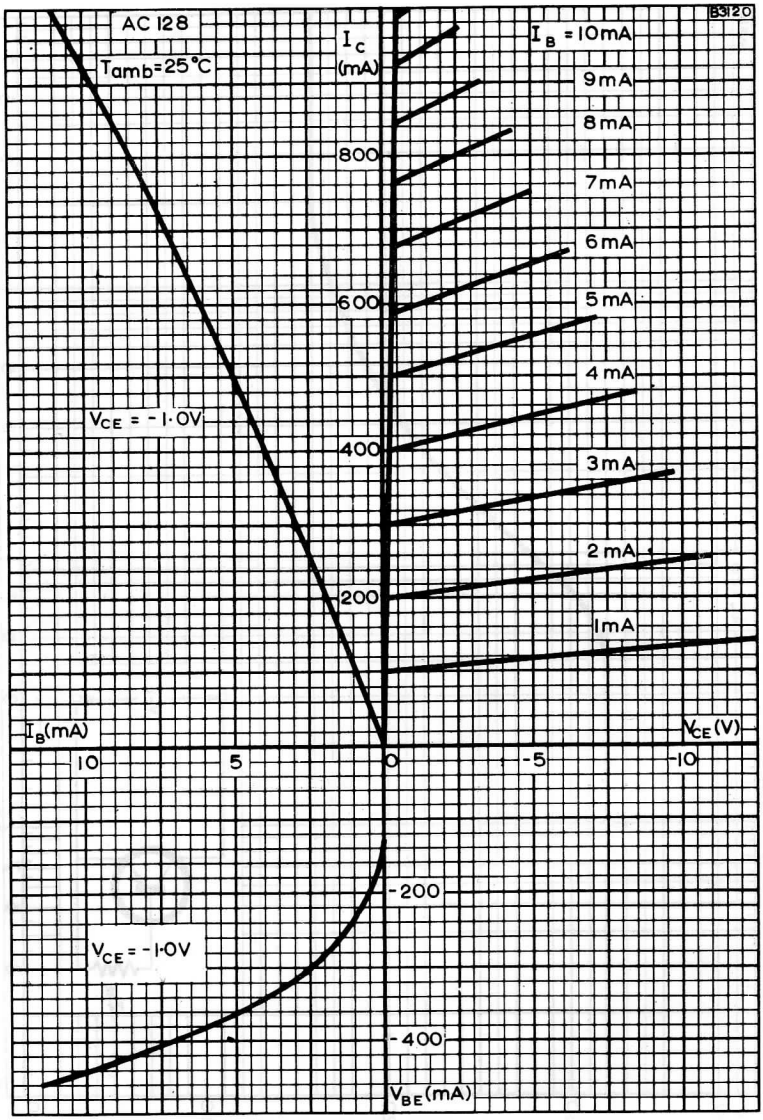
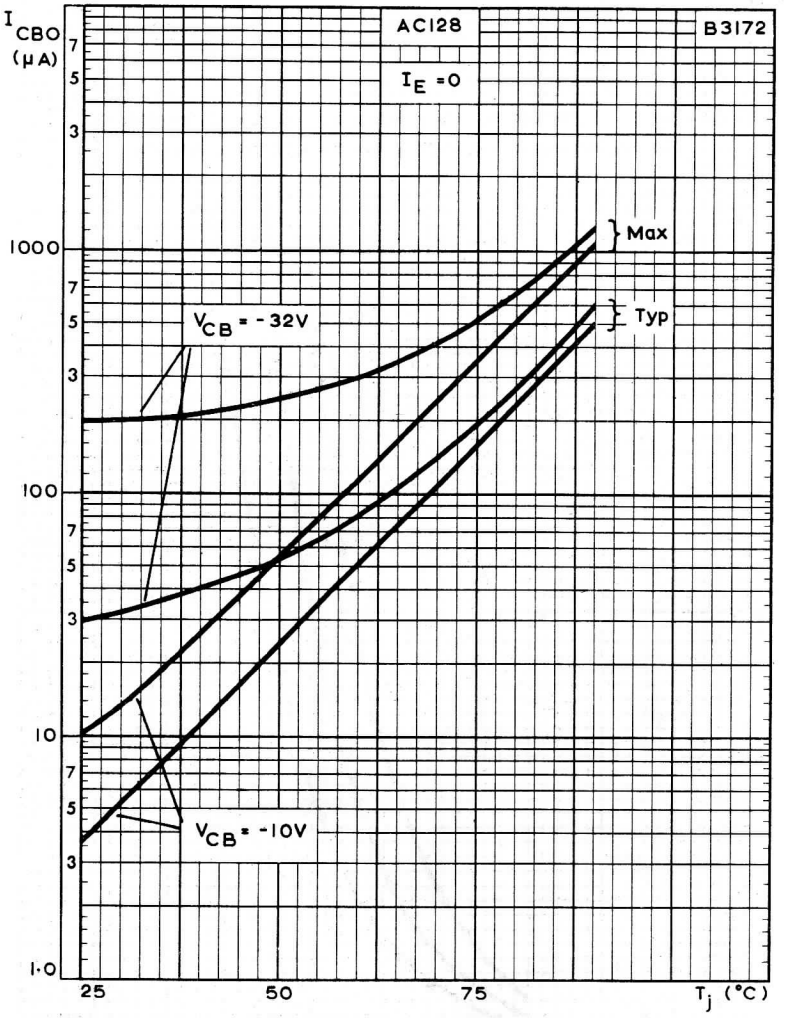


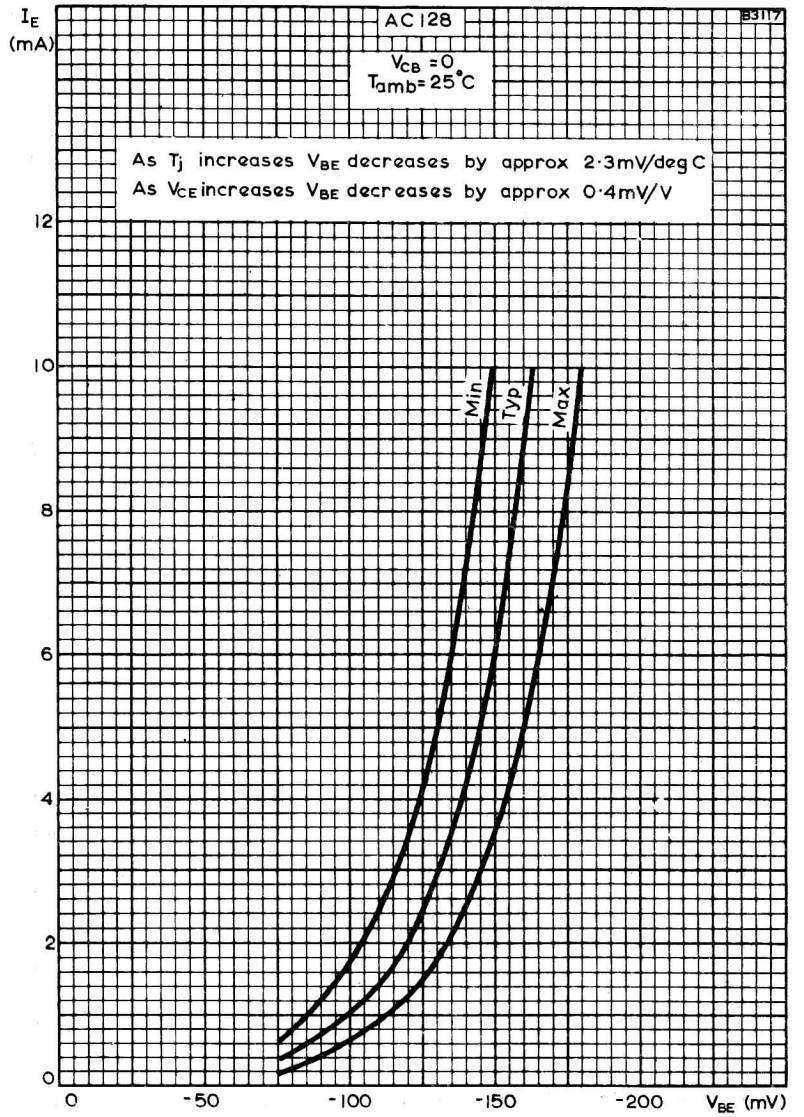
MAXIMUM COLLECTOR-EMITTER VOLTAGE PLOTTED AGAINST BASE-EMITTER IMPEDANCE



TYPICAL CHARACTERISTICS



COLLECTOR-BASE CUT-OFF CURRENT PLOTTED AGAINST JUNCTION TEMPERATURE



COMMON EMITTER INPUT CHARACTERISTICS FOR LOW EMITTER CURRENTS

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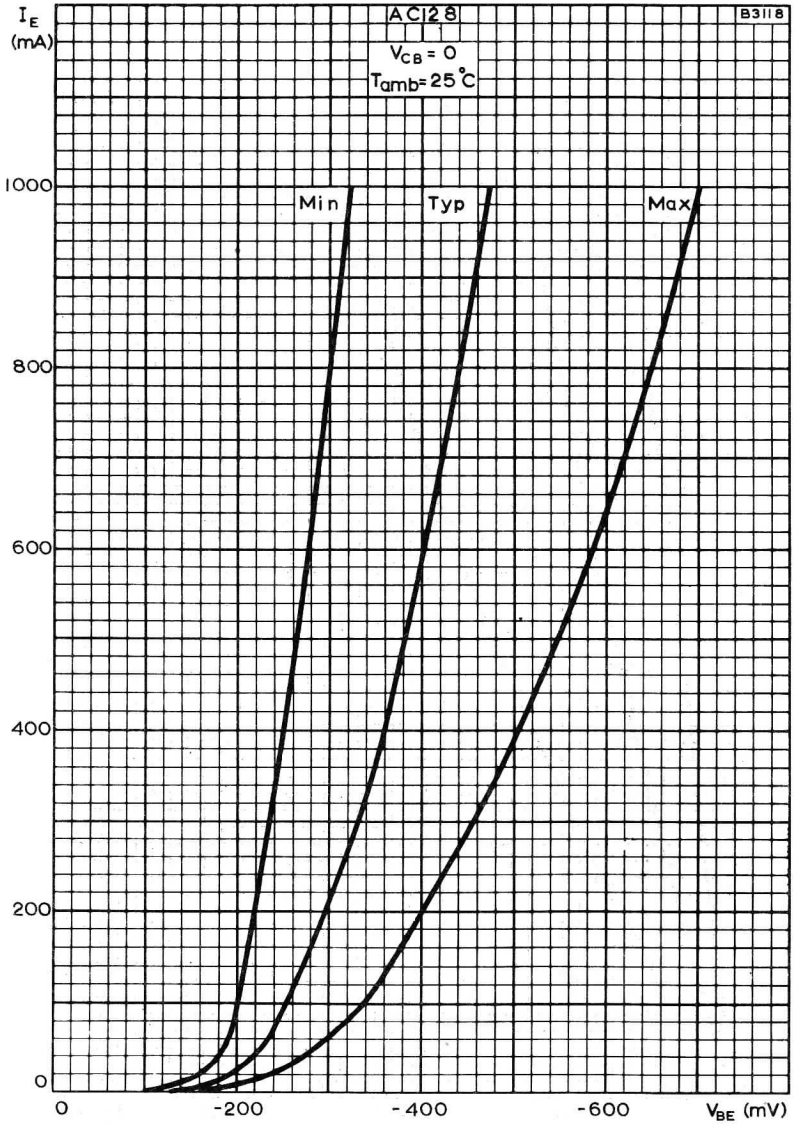

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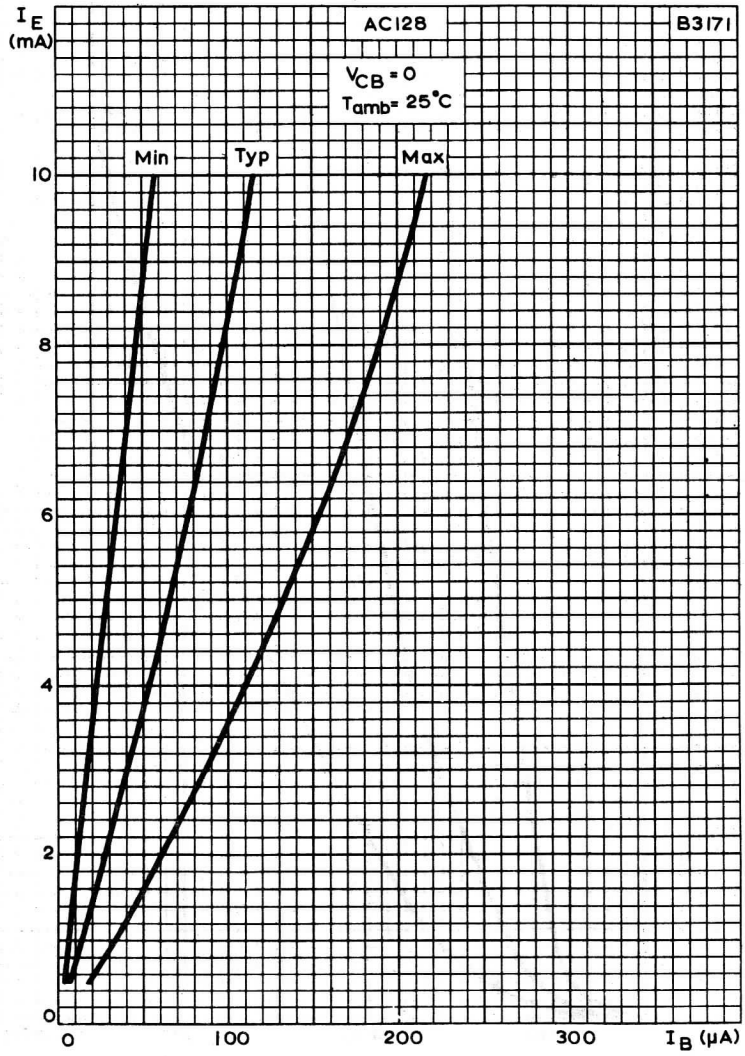

COMMON EMITTER TRANSFER CHARACTERISTICS FOR LOW EMITTER CURRENTS

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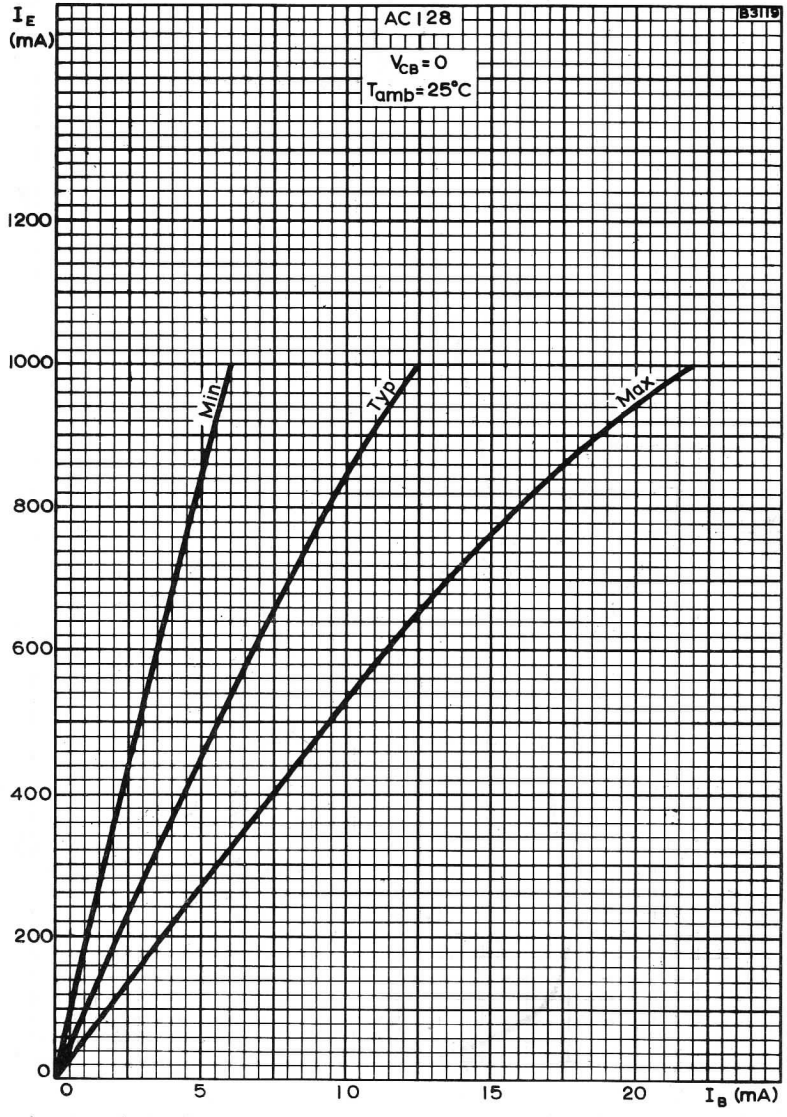

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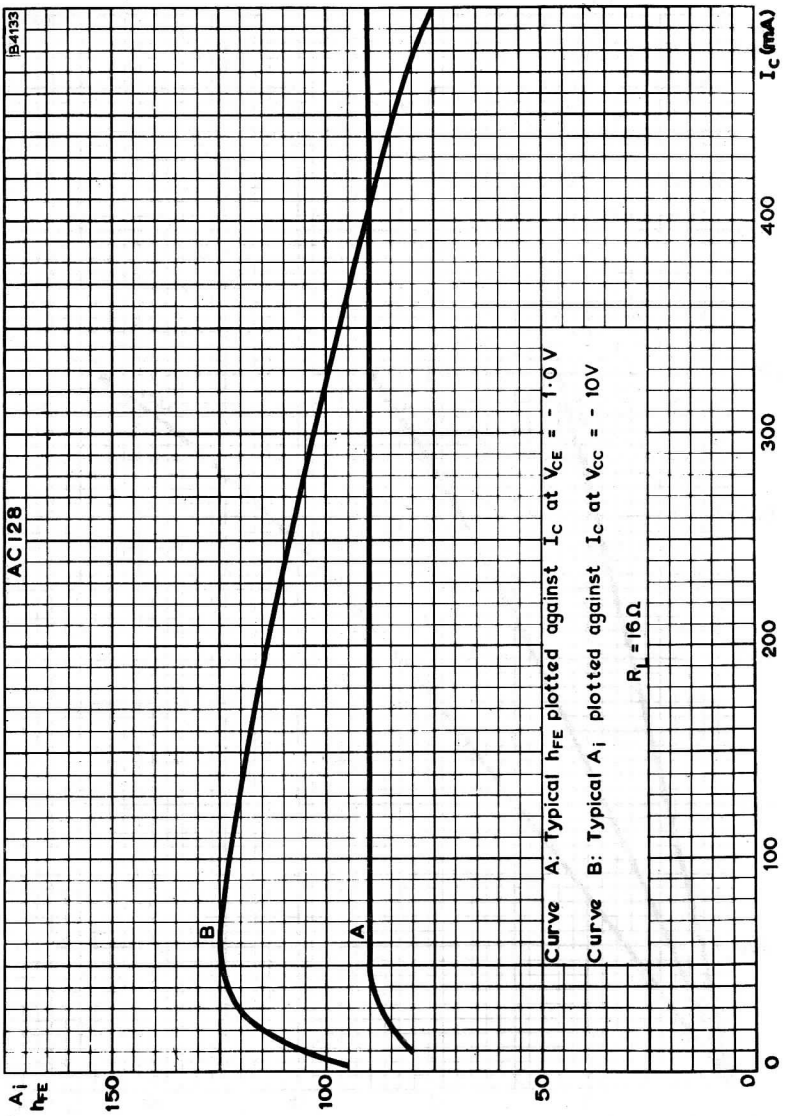

CURVE A: TYPICAL LARGE SIGNAL FORWARD CURRENT TRANSFER RATIO PLOTTED AGAINST COLLECTOR CURRENT

CURVE B: TYPICAL LOADED SMALL SIGNAL FORWARD CURRENT TRANSFER RATIO PLOTTED AGAINST COLLECTOR CURRENT