

# GERMANIUM N-P-N HIGH-GAIN TRANSISTOR

# AC127

Germanium n-p-n high gain alloy junction transistor intended for complementary symmetrical Class 'B' output stages. TO-18 construction with envelope isolated.

### QUICK REFERENCE DATA

$V_{CB}$ max. ( $I_E = 0$ )	+32	V
$V_{CER}$ max. ( $R_{BE} < 60\Omega$ )	+32	V
$I_{CM}$ max.	500	mA
$P_{tot}$ max. ( $T_{amb} = 25^\circ\text{C}$ )	340	mW
$h_{FE}$ (typ) ( $I_C = 500\text{mA}$ )	50	
$f_T$ (typ)	2.5	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
$V_{CER}$ max. ( $R_{BE} < 60\Omega$ ) (see page C1)	+32	V
$I_{CM}$ max.	500	mA
* $I_{C(AV)}$ max.	500	mA
$I_{EM}$ max.	525	mA
* $I_{E(AV)}$ max.	525	mA
$I_{BM}$ max.	25	mA
* $I_{B(AV)}$ max.	25	mA
$P_{tot}$ max.	340	mW

\*Averaged over any 20ms period.

#### Thermal

$T_{stg}$ min.	-55	$^\circ\text{C}$
$T_{stg}$ max.	90	$^\circ\text{C}$
$T_j$ max.	90	$^\circ\text{C}$
$T_j$ max. (intermittent operation, total duration = 200 hours)	100	$^\circ\text{C}$



### THERMAL CHARACTERISTICS

$\Theta_{j-amb}$ (in free air)	0.37 deg C/mW
$\Theta_{j-case}$	0.11 deg C/mW
$\Theta_{j-amb}$ in free air with cooling clip as shown on page D4	0.22 deg C/mW
$\Theta_{j-amb}$ in free air with cooling clip giving good thermal contact mounted on a heatsink of 16 s.w.g. aluminium, minimum area 12.5 cm <sup>2</sup>	0.16 deg C/mW

### ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25^{\circ}C$ unless otherwise stated)

		Min.	Typ.	Max.	
Collector-base breakdown voltage	$V_{(BR)CBO}$	+32	-	-	V
$I_C = 500\mu A$					
Emitter-base breakdown voltage	$V_{(BR)EBO}$	+10	-	-	V
$I_E = 200\mu A$					
Collector knee voltage	$V_{CE(knee)}$	-	-	+1.2	V
$I_C = 500mA$ , (see fig. 1)					
Base emitter voltage	$V_{BE}$	-	+120	-	mV
$V_{CB} = +5V, I_E = 2mA$					
$V_{CB} = 0, I_E = 500mA$		-	-	+1.2	V
Collector cut-off current	$I_{CBO}$	-	-	10	$\mu A$
$V_{CB} = +0.5V$					
Emitter cut-off current	$I_{EBO}$	-	-	550	$\mu A$
$V_{EB} = +5V, T_j = 75^{\circ}C$					
Large signal forward current transfer ratio	$h_{FEL}$	50	-	200	
$V_{CB} = 0, I_C = 20mA$					
$I_C = 500mA$		25	-	143	

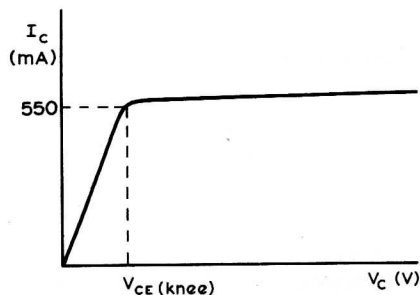


Fig 1.



# GERMANIUM N-P-N HIGH-GAIN TRANSISTOR

# AC127

		Min.	Typ.	Max.	
Intrinsic base resistance	$r_{bb'}$				
$V_{CB} = +5V, I_E = 1mA, f = 450kc/s$		-	70	-	$\Omega$
Collector depletion capacitance	$c_{tc}$				
$V_{CB} = +5V, I_E = 0, f = 450kc/s$		-	70	-	pF
Transition frequency	$f_T$				
$V_{CB} = +2V, I_E = 10mA$		1.5	2.5	-	Mc/s
Common emitter cut-off frequency	$f_{hfe}$				
$V_{CB} = +2V, I_E = 10mA$		10	20	-	kc/s
Noise figure	NF				
$V_{CB} = +5V, I_E = 500\mu A, f = 1kc/s$		-	4	10	dB

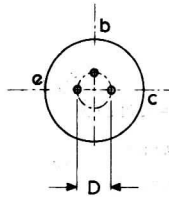
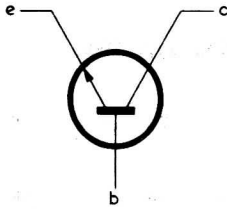
## SOLDERING AND WIRING RECOMMENDATIONS

1. When using a soldering iron, the transistor may be soldered directly into a circuit, but heat conducted to the junction should if possible be kept to a minimum by the use of a heat shunt.
2. The transistor may be dip-soldered at a solder temperature of  $245^{\circ}C$  for a maximum time of 5 seconds. The case temperature during dip-soldering may exceed the maximum storage temperature for a period not greater than 2 minutes, provided that it at no time exceeds  $115^{\circ}C$ . This recommendation applies to a transistor mounted flush on a board having punched-through holes, or spaced at least 1.5mm away from a board having plated-through holes.
3. Care should be taken not to bend the leads nearer than 1.5mm from the seal.

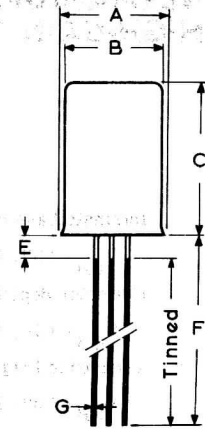


**OUTLINE**

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



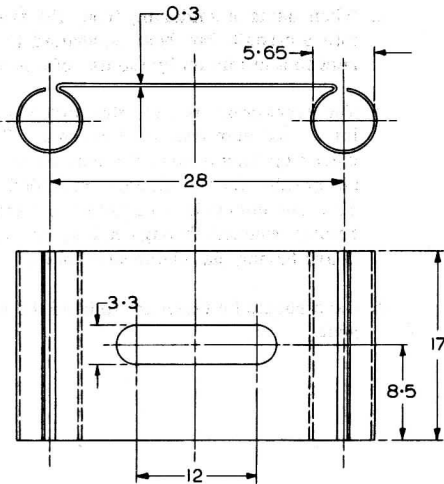
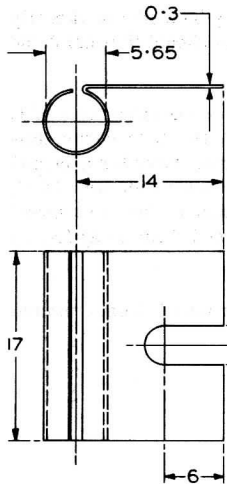
B3263



**DIMENSIONS (in millimetres)**

	Min.	Nom.	Max.
A	-	-	6.5
B	-	-	6.1
C	-	-	9.4
D	-	1.8	-
E	-	-	1.5
F	38	-	-
G	-	0.43	-

**OUTLINE AND DIMENSIONS OF COOLING CLIPS**



Nominal dimensions in mm

B3121

Type a.

Part No. 56227

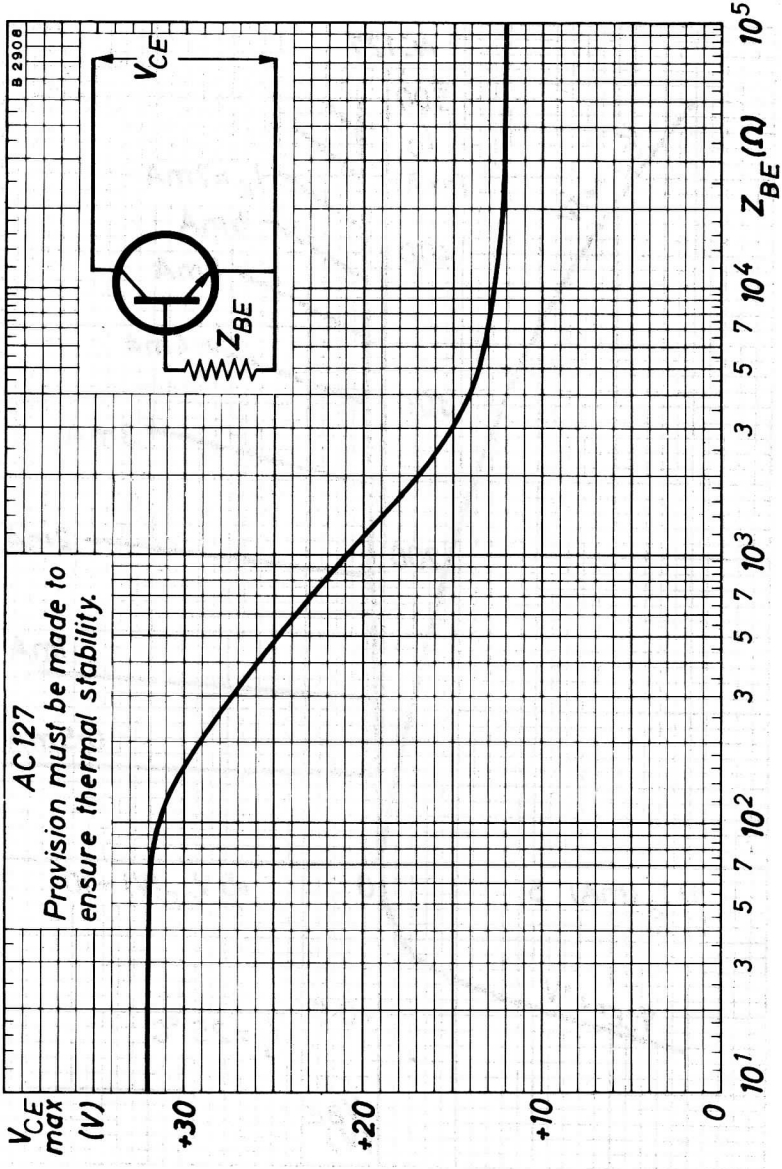
Type b.

Part No. 56226



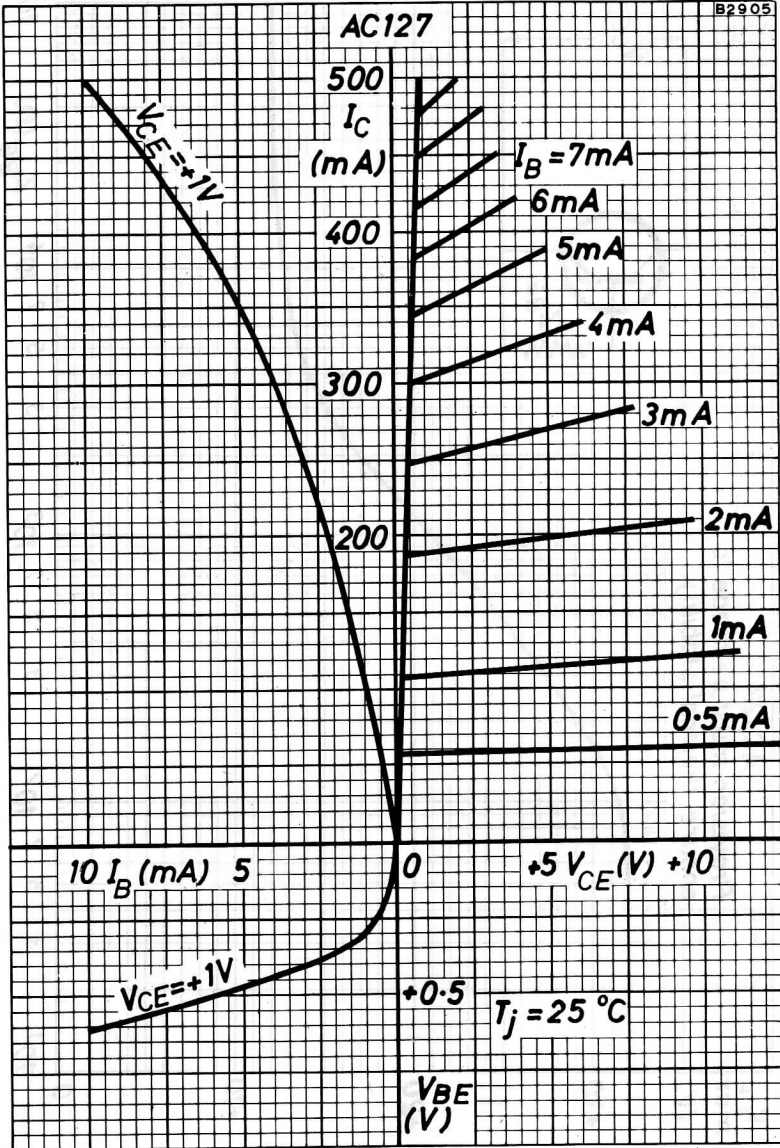
**GERMANIUM N-P-N  
HIGH-GAIN TRANSISTOR**

**AC127**



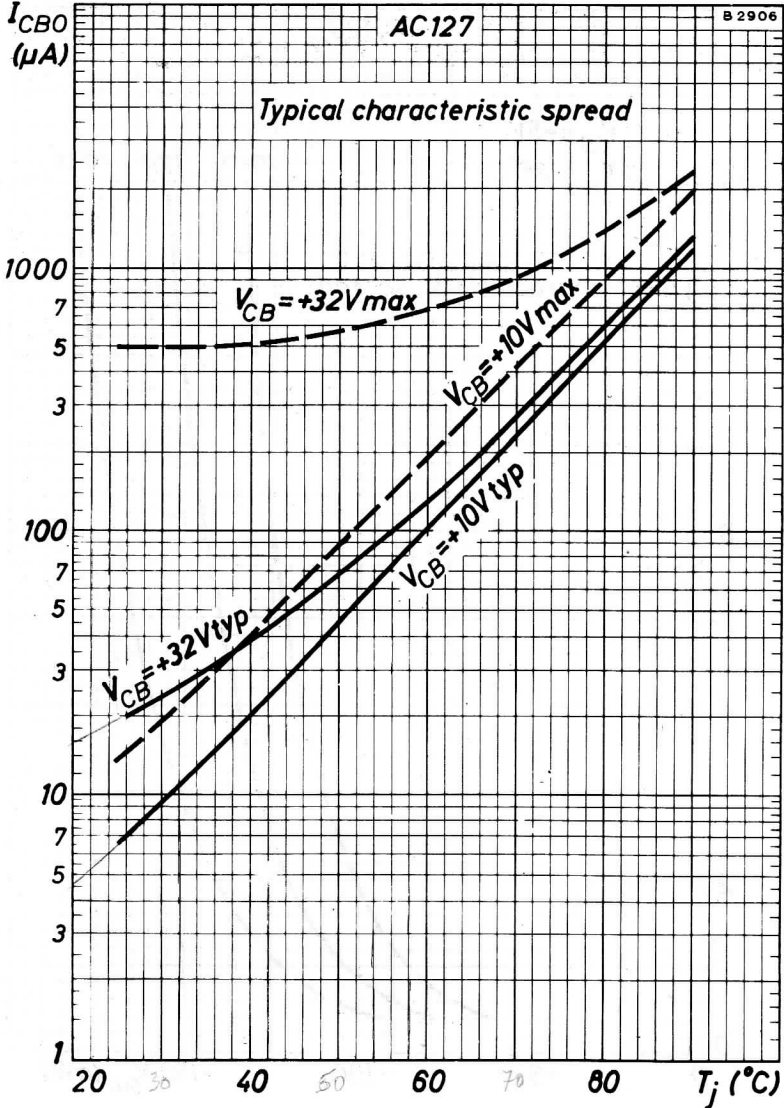
MAXIMUM COLLECTOR-EMITTER VOLTAGE PLOTTED AGAINST  
BASE EMITTER IMPEDANCE





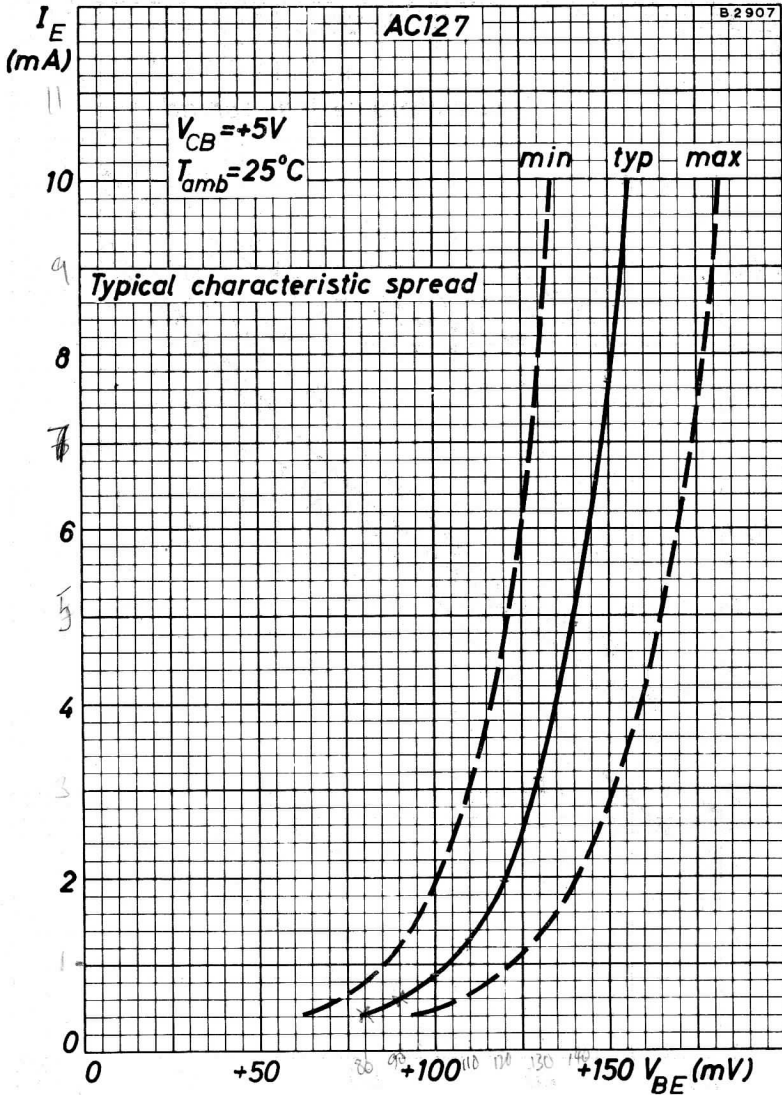
TYPICAL CHARACTERISTICS





COLLECTOR-BASE CUT-OFF CURRENT PLOTTED AGAINST JUNCTION TEMPERATURE



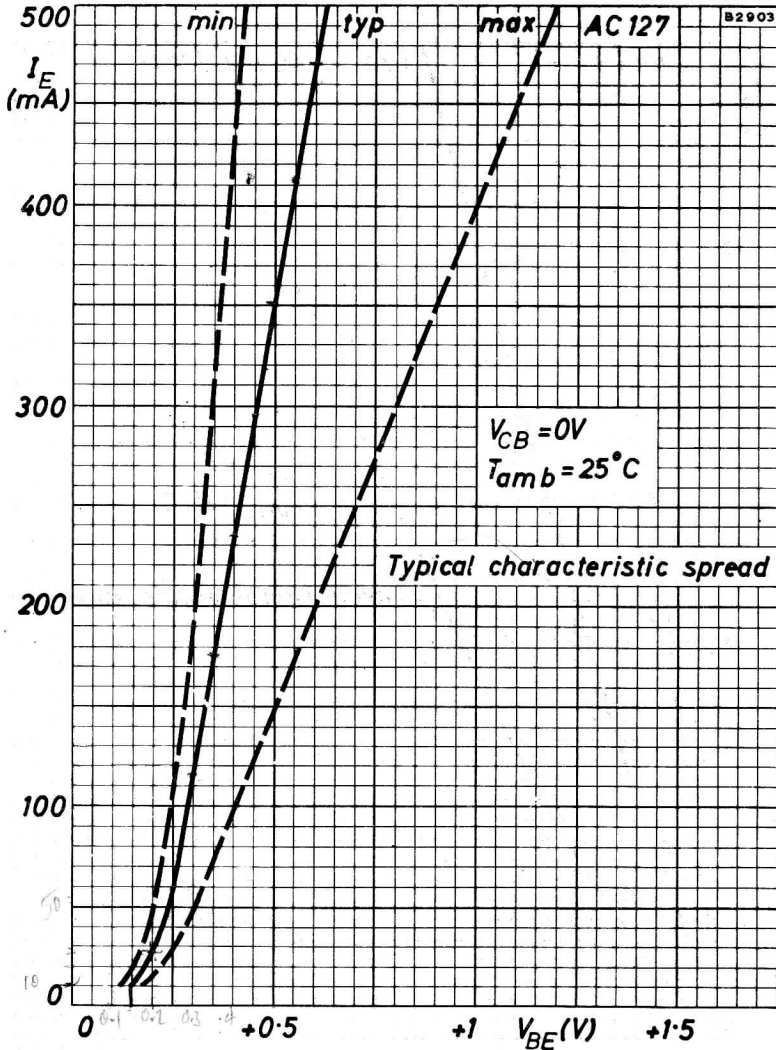


COMMON EMITTER INPUT CHARACTERISTICS FOR LOW EMITTER CURRENTS



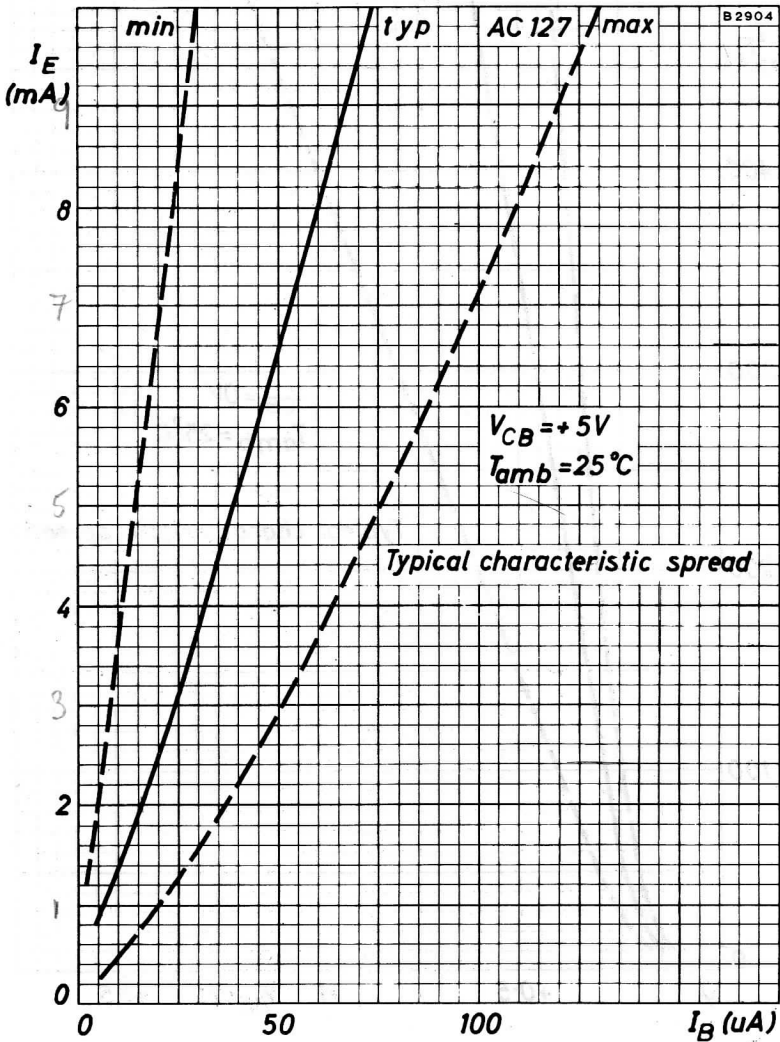
# GERMANIUM N-P-N HIGH-GAIN TRANSISTOR

# AC127



COMMON EMITTER INPUT CHARACTERISTICS FOR HIGH EMITTER CURRENTS



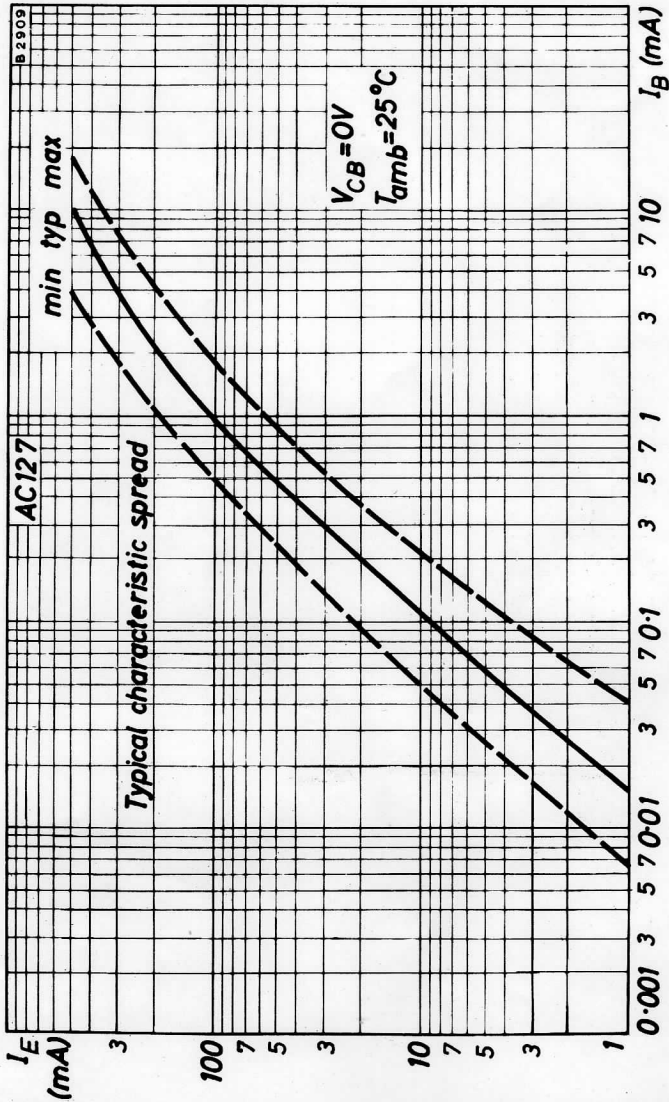


COMMON EMITTER TRANSFER CHARACTERISTICS FOR LOW EMITTER CURRENTS



# GERMANIUM N-P-N HIGH-GAIN TRANSISTOR

# AC127



COMMON EMITTER TRANSFER CHARACTERISTICS FOR HIGH EMITTER CURRENTS

