PNP Germanium Transistors

AC 121
AC 152

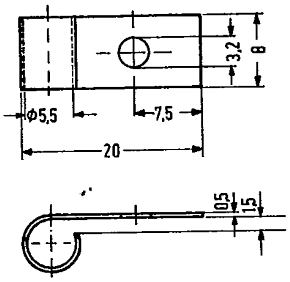
SIEMENS AKTIENGESELLSCHAF

Not for new design

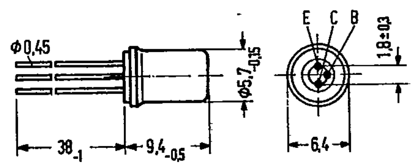
for AF, driver and output stages of medium performance

AC 121 and AC 152 are alloyed germanium PNP transistors in 1 A 3 DIN 41871 metal case (similar to TO 1).
The leads of these transistors are electrically insulated from the case. The collector terminal is marked by a red dot at the rim of the case. For use in push-pull output stages, the transistors AC 121 and AC 152 are available in pairs. A fixing part (heat sink[1]) is provided for fixing on the chassis; it has to be ordered separately.

Type	Ordering code	Type	Ordering code
AC 121 IV	Q60103-D121	AC 152 IV	Q60103-X152-D
AC 121 V	Q60103-E121	AC 152 V	Q60103-X152-E
AC 121 VI	Q60103-F121	AC 152 VI	Q60103-X152-F
AC 121 VII	Q60103-G121	AC 152 paired	Q60103-X152-P
AC 121 paired	Q60103-P121-X1	Heat sink	Q62901-B1



Approx. weight 2 g



Approx. weight 1 g

Dimensions in mm

Maximum ratings		AC 121	AC 152	
Collector-emitter voltage	$-V_{CEO}$	20	24	V
Collector-emitter voltage ($V_{BE} \geqq 0.2$ V)	$-V_{CEV}$	20	32	V
Collector-base voltage	$-V_{CBO}$	20	32	V
Emitter-base voltage	$-V_{EBO}$	10	10	V
Collector current	$-I_C$	300	500	mA
Base current	$-I_B$	60	100	mA
Junction temperature	T_j	90	90	°C
Storage temperature range	T_{stg}	−55 to +75		°C
Total power dissipation	P_{tot}	900	900	mW
Thermal resistance				
Junction to ambient air	R_{thJA}	≦300	≦300	K/W
Junction to case	R_{thJC}	≦50	≦50	K/W

1) Thermal resistance between transistor case and heat sink below the fixing screw at careful mounting: $R_{th} \leqq 10$ K/W

Static characteristics (T_{amb} = 25 °C)

The transistors AC 121, AC 152 are grouped according to the DC current gain h_{FE} at $-I_C$ = 100 mA, and marked by Roman numerals. The following values apply at a collector voltage of $-V_{CE}$ = 0.5 V and the following collector currents:

h_{FE} group		IV	V	VI	VII	
Type		AC 152	AC 152	AC 152	–	AC 152
		AC 121	AC 121	AC 121	AC 121	AC 121
$-I_C$ mA	$-I_C$ mA	h_{FE} I_C/I_B	h_{FE} I_C/I_B	h_{FE} I_C/I_B	h_{FE} I_C/I_B	$-V_{BE}$ V
[2]	3	48 [47]	80 [78]	115 [114]	200	0.13 (<0.22)
100	100	45 (30 to 60)	75 (50 to 100)	110 (75 to 150)	190 (125 to 250)	0.32 (<0.55)
[500]	300	35 [28]	58 [47]	86 [68]	148	0.44 (<0.8) [0.52 (<1.0)]

Static characteristics (T_{amb} = 25 °C)

		AC 121	
Collector-emitter saturation voltage ($-I_C$ = 100 mA; h_{FE} = 20)	$-V_{CEsat}$[1]	0.11 (<0.3)	V
Collector-emitter saturation voltage ($-I_C$ = 300 mA; h_{FE} = 20)	$-V_{CEsat}$[1]	0.15 (<0.35)	V
Collector-emitter saturation voltage	$-V_{CEsat}$	0.28 (<0.45)[2]	V
Emitter cutoff current ($-V_{EBO}$ = 10 V)	$-I_{EBO}$	4 (<25)	µA
Collector cutoff current ($-V_{CBO}$ = 20 V)	$-I_{CBO}$	5 (<25)	µA
Collector cutoff current ($-V_{CEV}$ = 20 V; V_{BE} ≥0.2 V)	$-I_{CEV}$	5 (<25)	µA

		AC 152	
Collector-emitter saturation voltage ($-I_C$ = 100 mA; h_{FE} = 20)	$-V_{CEsat}$[1]	0.11 (<0.18)	V
Collector-emitter saturation voltage ($-I_C$ = 300 mA; h_{FE} = 20)	$-V_{CEsat}$[1]	0.15 (<0.25)	V
Collector-emitter saturation voltage	$-V_{CEsat}$	0.32 (<0.5)[2]	V
Collector cutoff current ($-V_{CBO}$ = 32 V)	$-I_{CBO}$	6 (<25)	µA
Collector cutoff current ($-V_{CEV}$ = 32 V); (V_{BE} = 0.2 V)	$-I_{CEV}$	6 (<25)	µA
Emitter cutoff current (V_{EBO} = 10 V)	$-I_{EBO}$	4 (<25)	µA

1) The transistor is overloaded to such a degree that the DC current gain decreases to h_{FE} = 20.
2) ($-I_C$ = 500 mA for the characteristic which, at a constant base current, intersects the operating point, where $-I_C$ = 550 mA; $-V_{CE}$ = 0.5 V)

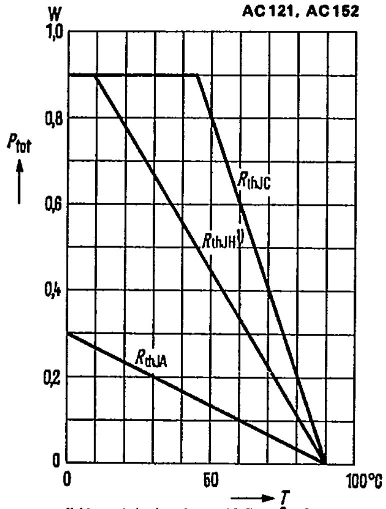
Condition for matching pairs: AC 152/AC 152	ΔV_{BE}	<35	mV
($-I_C$ = 100 mA; $-V_{CE}$ = 0.5 V)	$\frac{h_{FE1}}{h_{FE2}}$	1.25	–
Condition for matching pairs: AC 127/AC 152	ΔV_{BE}	<35	mV
($\pm I_C$ = 300 mA; V_{CB} = 0)	$\frac{h_{FE1}}{h_{FE2}}$	<1.25	–
Condition for matching pairs: AC 121/AC 121	ΔV_{BE}	<35	mV
($-I_C$ = 300 mA; $-V_{CE}$ = 0.5 V)	$\frac{h_{FE1}}{h_{FE2}}$	<1.25	–

Dynamic characteristics (T_{amb} = 25°C)

		AC 121	
Cutoff frequency ($-I_C$ = 20 mA; $-V_{CE}$ = 5 V)	f_{hfe}	17	kHz
Transition frequency	f_T	1.5	MHz
Base intrinsic resistance	$r_{bb'}$	60	Ω
Collector-base capacitance ($-V_{CBO}$ = 5 V)	C_{CBO}	25 (<40)	pF

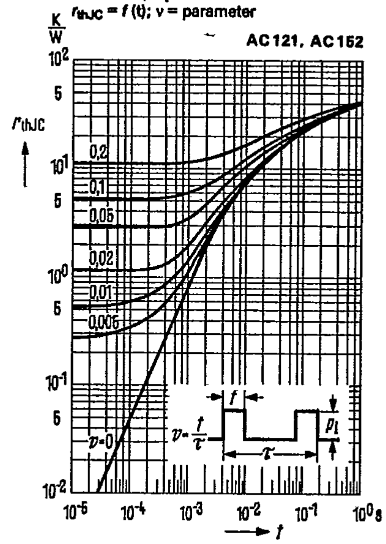
		AC 152	
Cutoff frequency ($-I_C$ = 5 mA; $-V_{CE}$ = 5 V)	f_{hfe}	15	kHz
Transition frequency	f_T	1.5	MHz
Base intrinsic resistance	$r_{bb'}$	75 (<200)	Ω
Collector-base capacitance ($-V_{CBO}$ = 5 V)	C_{CBO}	25 (<40)	pF

Total perm. power dissipation versus temperature
$P_{tot} = f(T)$; R_{th} = parameter

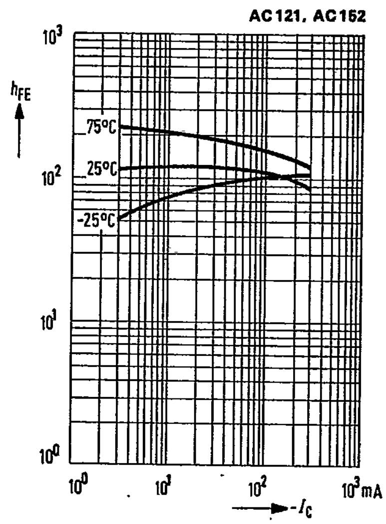


1) Heat sink aluminum 12.5 cm² x 2 mm

Permissible pulse load
$r_{thJC} = f(t)$; v = parameter

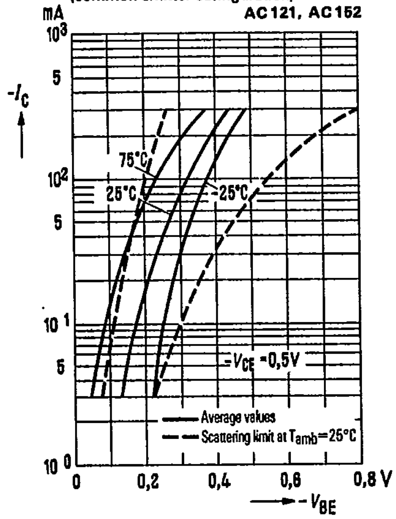


DC current gain $h_{FE} = f(I_C)$
$-V_{CE} = 0.5$ V; T_{amb} = parameter
(common emitter configuration)

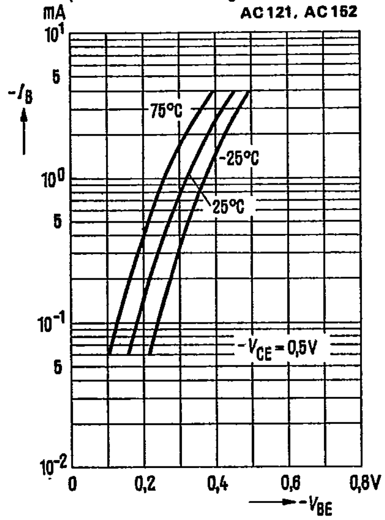


AC 121
AC 152

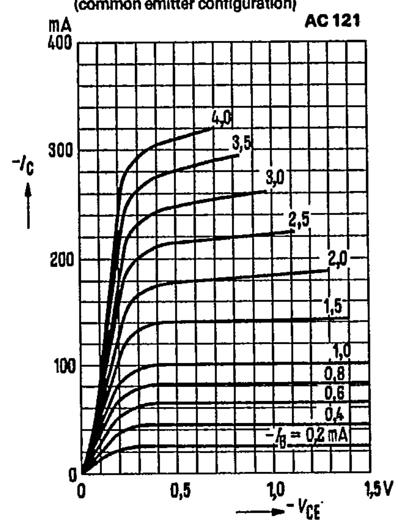
Collector current $I_C = f(V_{BE})$
$-V_{CE} = 0.5$ V; T_{amb} = parameter
(common emitter configuration)



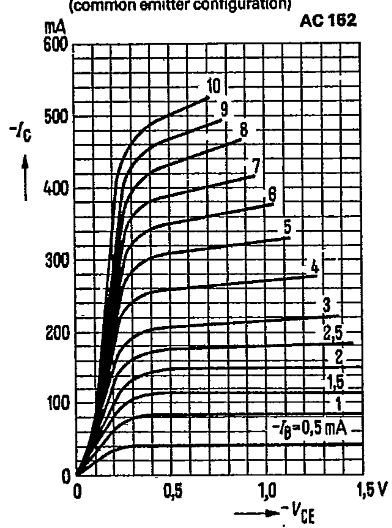
Input characteristics $I_B = f(V_{BE})$
$-V_{CE} = 0.5$ V; T_{amb} = parameter
(common emitter configuration)



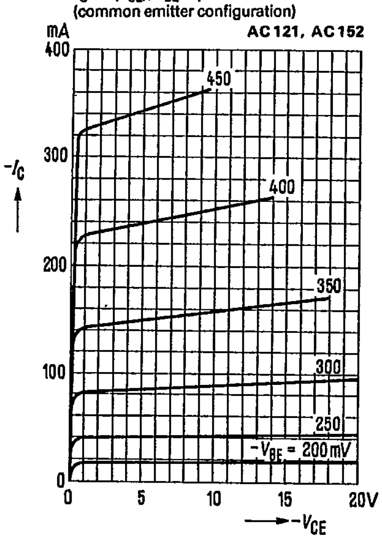
Output characteristics
$I_C = f(V_{CE})$; I_B = parameter
(common emitter configuration)



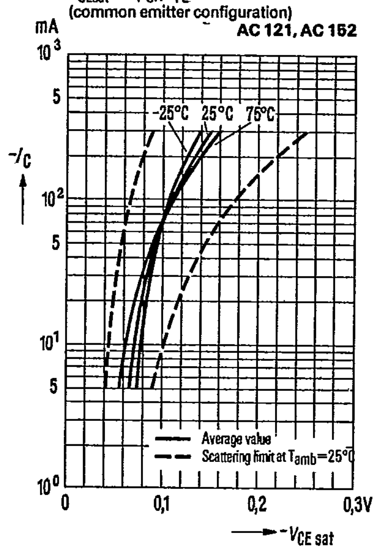
Output characteristics
$I_C = f(V_{CE})$; I_B = parameter
(common emitter configuration)



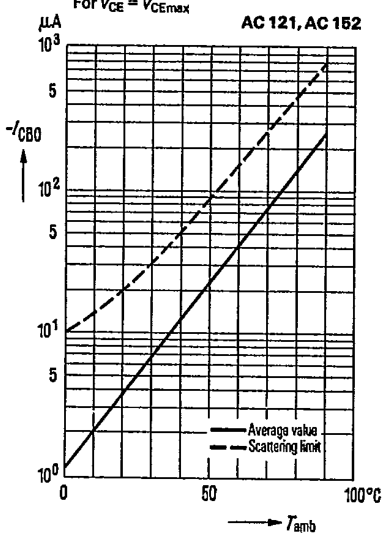
Output characteristics
$I_C = f(V_{CE})$; V_{BE} = parameter
(common emitter configuration)



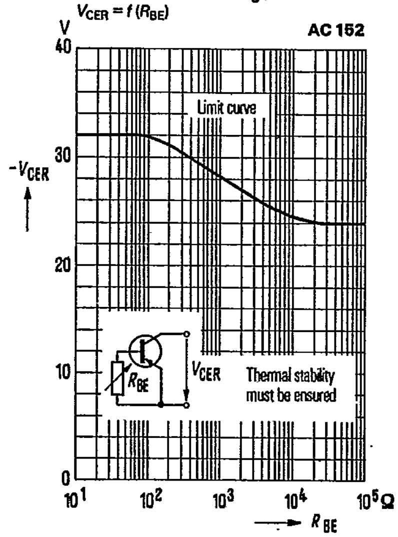
Collector emitter saturation voltage
$V_{CEsat} = f(I_C)$; $h_{FE} = 20$
(common emitter configuration)



Collector cutoff current versus temperature $I_{CBO} = f(T_{amb})$
For $V_{CE} = V_{CEmax}$



Collector-emitter voltage
$V_{CER} = f(R_{BE})$



Littlediode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.