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PNP Silicon Planar Transistor

BCY 67

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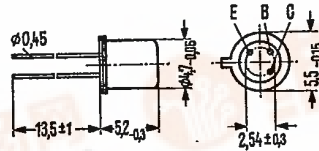
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BCY 67 is an epitaxial PNP silicon planar transistor in TO 18 case (18 A 3 DIN 41876). The collector is electrically connected to the case. The transistor is particularly provided for low-noise AF input stages. The complementary transistor is BCY 66.

Type	Ordering code
BCY 67	Q62702-C254



Approx. weight 0.3 g Dimensions in mm

Maximum ratings

Collector-emitter voltage	$-V_{CES}$	45	V
Collector-emitter voltage	$-V_{CEO}$	45	V
Emitter-base voltage	$-V_{EBO}$	5	V
Collector current	$-I_C$	50	mA
Base current	$-I_B$	5	mA
Junction temperature	T_j	200	°C
Storage temperature range	T_{stg}	-65 to +200	°C
Total power dissipation ($T_{case} = 45^\circ\text{C}$)	P_{tot}	1	W

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 450	K/W
Junction to case	R_{thJC}	≤ 150	K/W

Static characteristics ($T_{amb} = 25^\circ\text{C}$)

$-V_{CE}$ V	$-I_C$ mA	h_{FE} I_C/I_B	$-V_{BE}$ V
5	0.01	>40	0.5
5	2	350 (180 to 630)	0.62 (0.55 to 0.7)
1	10	120 to 1000 ¹⁾	0.7

Collector-emitter saturation voltage ($I_C = 10\text{ mA}$; $I_B = 0.25\text{ mA}$)	$-V_{CEsat}$	0.12 (<0.25)	V
Base-emitter saturation voltage ($I_C = 10\text{ mA}$; $I_B = 0.25\text{ mA}$)	$-V_{BEsat}$	0.7 (<0.85)	V

1) The upper limit applies to at least 90% of the transistors.



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Static characteristics ($T_{amb} = 25^{\circ}\text{C}$)

Collector cutoff current ($-V_{CES} = 45\text{ V}$)	$-I_{CES}$	2 (<10)*	nA
Collector cutoff current ($-V_{CES} = 35\text{ V}$; $T_{amb} = 150^{\circ}\text{C}$)	$-I_{CES}$	<10	μA
Emitter cutoff current ($-V_{EBO} = 4\text{ V}$)	$-I_{EBO}$	<20	nA
Collector-emitter breakdown voltage ($-I_{CEO} = 2\text{ mA}$)	$-V$	>45*	V
Collector-emitter breakdown voltage ($-I_{CES} = 10\text{ }\mu\text{A}$)	$-V_{(BR)CES}$	>45	V
Emitter-base breakdown voltage ($-I_{EBO} = 1\text{ }\mu\text{A}$)	$-V_{(BR)EBO}$	>5*	V

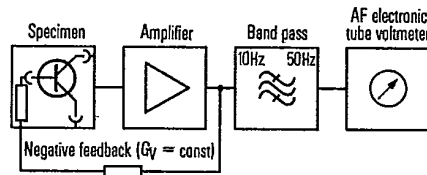
Dynamic characteristics ($T_{amb} = 25^{\circ}\text{C}$)

Transition frequency ($-I_C = 10\text{ mA}$; $-V_{CE} = 5\text{ V}$)	f_T	180	MHz
Collector-base capacitance ($-V_{CBO} = 10\text{ V}$; $f = 1\text{ MHz}$)	C_{CBO}	4.5 (<7)	pF
Emitter-base capacitance ($-V_{EBO} = 0.5\text{ V}$)	C_{EBO}	11 (<15)	pF
Noise figure $-I_C = 0.2\text{ mA}$; $-V_{CE} = 5\text{ V}$; $R_g = 2\text{ k}\Omega$; $f = 1\text{ kHz}$; $\Delta f = 200\text{ Hz}$	NF	1.2 (<2)	dB
$-I_C = 20\text{ }\mu\text{A}$; $-V_{CE} = 5\text{ V}$; $R_g = 10\text{ k}\Omega$; $f = 100\text{ Hz}$	NF	<4	dB
$-I_C = 20\text{ }\mu\text{A}$; $-V_{CE} = 5\text{ V}$; $R_g = 10\text{ k}\Omega$; $f = 1\text{ kHz}$	NF	<2	dB
$-I_C = 20\text{ }\mu\text{A}$; $-V_{CE} = 5\text{ V}$; $R_g = 10\text{ k}\Omega$; $f = 10\text{ kHz}$	NF	<2	dB
$-I_C = 200\text{ }\mu\text{A}$; $-V_{CE} = 5\text{ V}$; $R_g = 2\text{ k}\Omega$; $\Delta f = 15.7\text{ kHz}$	NF	<3	dB

Equivalent, base referred noise voltage

($I_C = 0.2\text{ mA}$; $V_{CE} = 5\text{ V}$; $R_g = 2\text{ k}\Omega$; $f = 10\text{ to }50\text{ Hz}$)	E_n	<0.135	μV
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Test circuit for noise voltage measurement



Four-pole characteristics ($-I_C = 2\text{ mA}$; $-V_{CE} = 5\text{ V}$; $f = 1\text{ kHz}$)

h_{11e}	4.5 (2.5 to 12)	k Ω
h_{12e}	2	10^{-4}
h_{21e}	330	-
h_{22e}	30 (<100)	μS

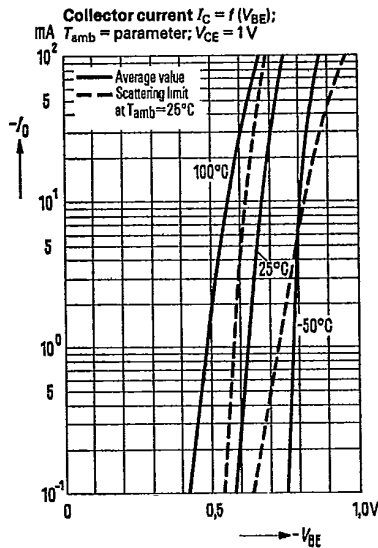
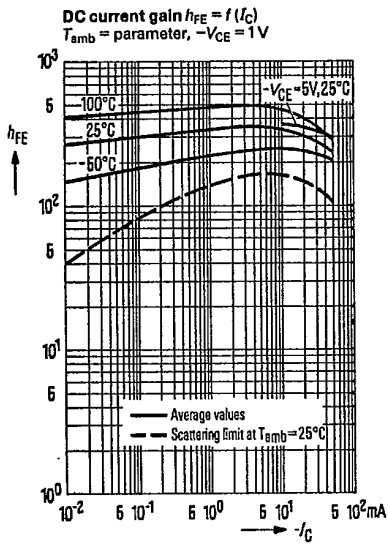
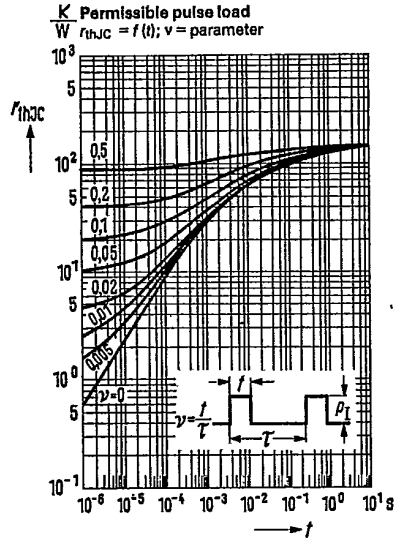
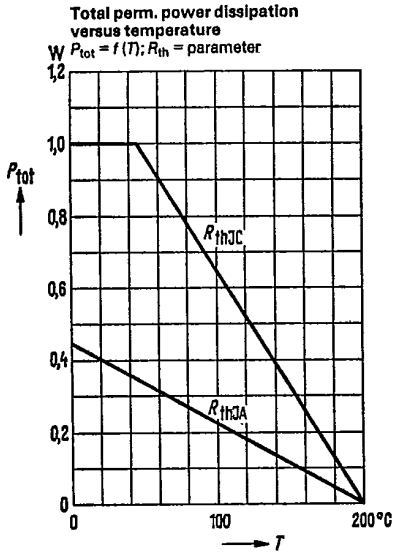
* AQL = 0.65%

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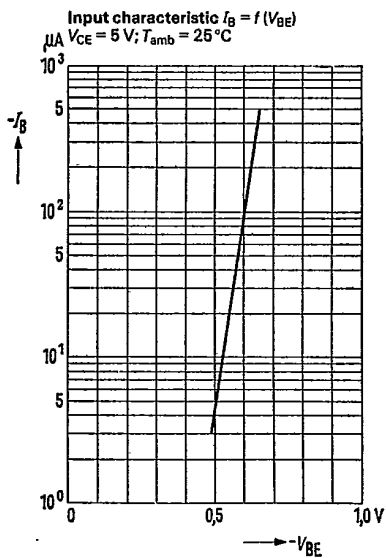
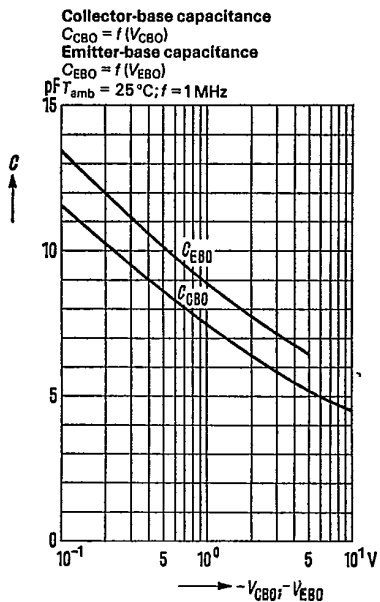
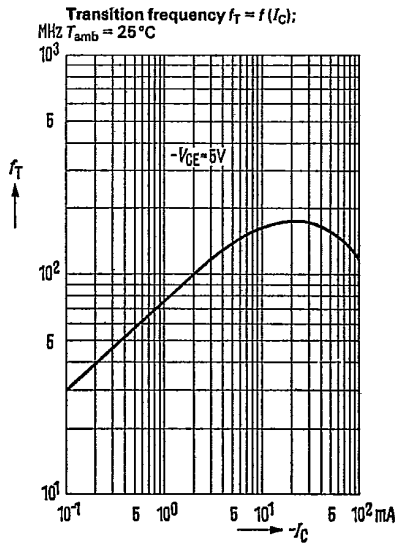
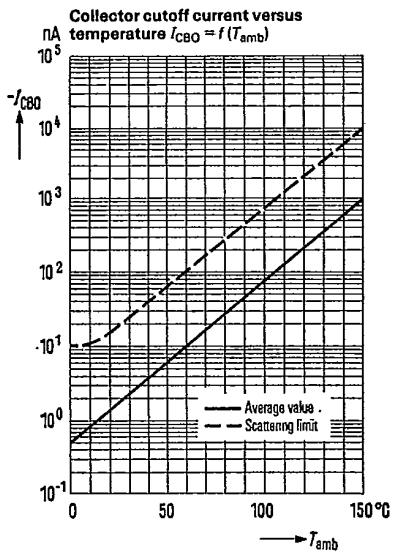
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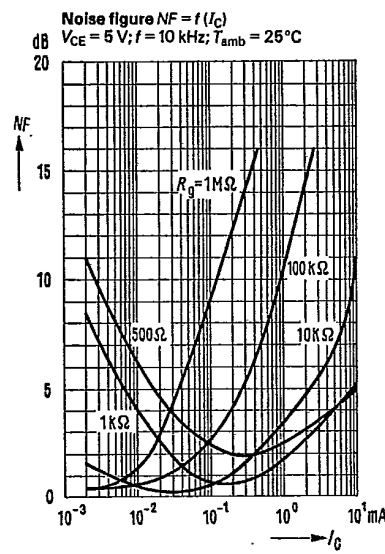
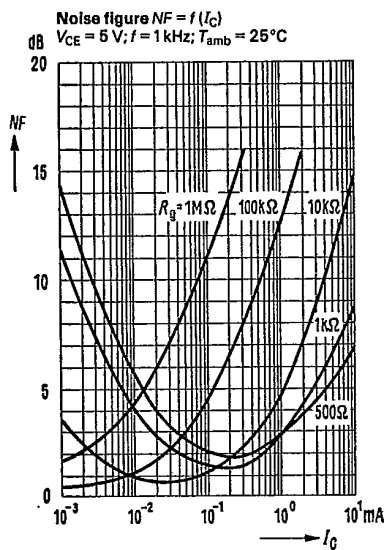
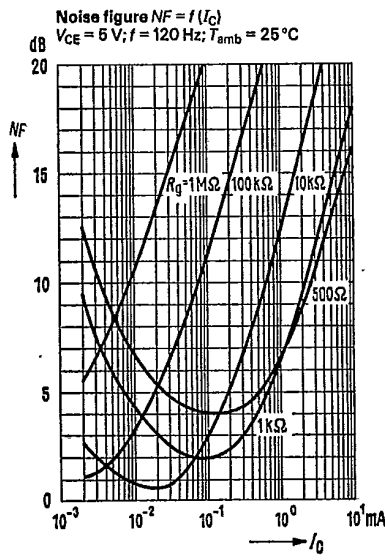
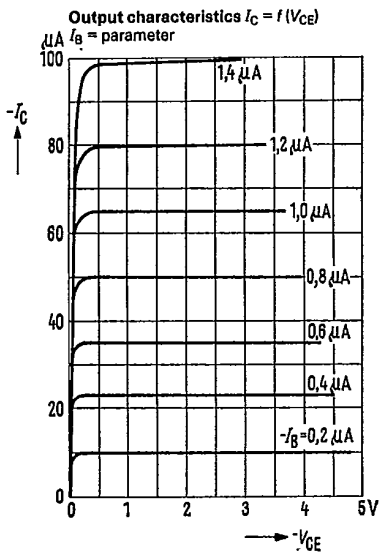
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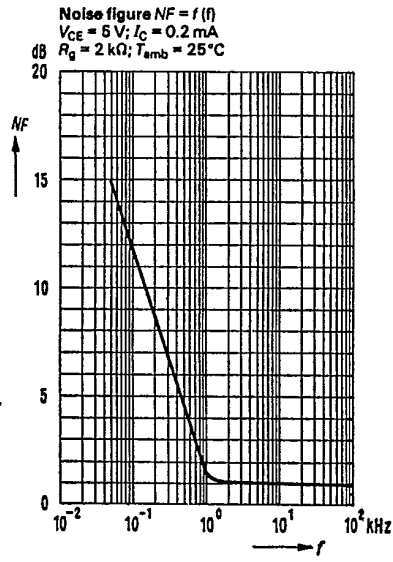
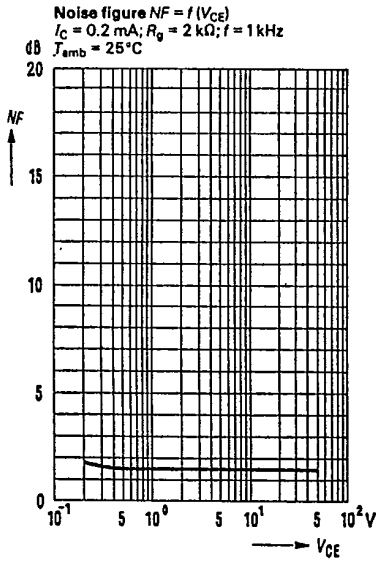
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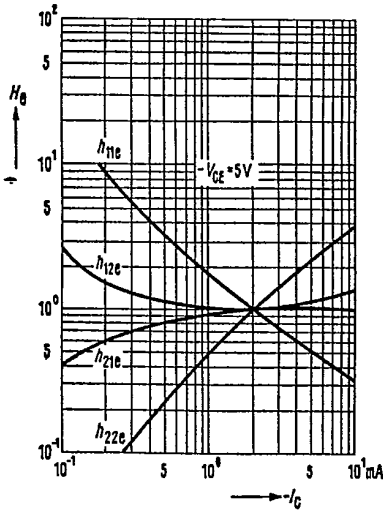
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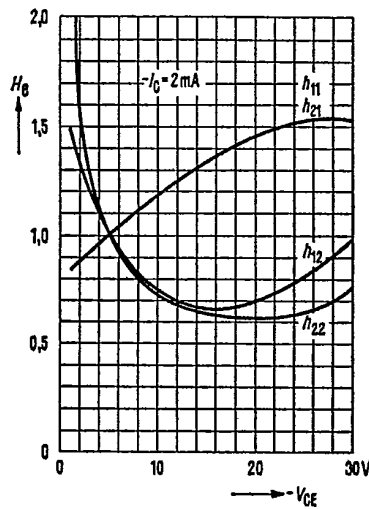
h-parameter versus collector current

$$H_o = \frac{h_o(I_C)}{h_o(I_C = 2 \text{ mA})} = f(I_C)$$



h-parameter versus collector-emitter voltage

$$H_o = \frac{h_o(V_{CE})}{h_o(V_{CE} = 5 \text{ V})} = f(V_{CE})$$



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