

NPN Silicon Planar Transistor

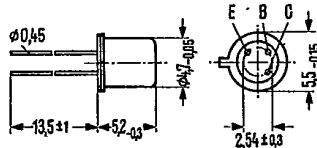
BCY 66

SIEMENS AKTIENGESELLSCHAFT

T-29-23

BCY 66 is an epitaxial NPN 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 67.

Type	Ordering code
BCY 66	Q60203-Y66



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}	7	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 ($T_{case} \leq 45^\circ C$)	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 ($T_{amb} = 25^\circ C$)

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 ($I_C = 10$ mA; $I_B = 0.25$ mA)	V_{CEsat}	0.12 (<0.35)	V
Base-emitter saturation voltage ($I_C = 10$ mA; $I_B = 0.25$ mA)	V_{BEsat}	0.7 (<0.85)	V

1) The upper limit applies to at least 90% of the transistors.
*) AQL = 0.65%

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

Collector cutoff current ($V_{CES} = 45\text{ V}$)
 Collector cutoff current
 ($V_{CES} = 45\text{ V}; T_{amb} = 150^{\circ}\text{C}$)
 Emitter cutoff current ($V_{EBO} = 5\text{ V}$)
 Collector-emitter breakdown voltage
 ($I_{CEO} = 2\text{ mA}$)
 Emitter-base breakdown voltage ($I_{EBO} = 1\text{ }\mu\text{A}$)

I_{CES}	0.2 (<10)	nA
I_{CES}	0.2 (<10)	μA
I_{EBO}	<10*	nA
$V_{(BR)CEO}$	>45*	V
$V_{(BR)EBO}$	>7*	V

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

Transition frequency
 ($I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$)
 Collector-base capacitance
 ($V_{CBO} = 10\text{ V}; f = 1\text{ MHz}$)
 Emitter-base capacitance
 ($V_{EBO} = 0.5\text{ V}; f = 1\text{ MHz}$)
 Noise figure ($I_C = 0.2\text{ mA}; V_{CE} = 5\text{ V};$
 $R_g = 2\text{ k}\Omega; f = 1\text{ kHz}; \Delta f = 200\text{ Hz}$)
 $I_C = 20\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; f = 100\text{ Hz}; R_g = 10\text{ k}\Omega$
 $I_C = 20\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; f = 1\text{ kHz}; R_g = 10\text{ k}\Omega$
 $I_C = 20\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; f = 10\text{ kHz}; R_g = 10\text{ k}\Omega$
 $I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; \Delta f = 15.7\text{ kHz};$
 $R_g = 2\text{ k}\Omega$

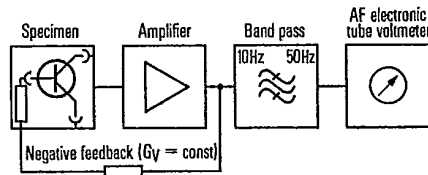
f_T	250 (>125)	MHz
C_{CBO}	3.5 (<6)	pF
C_{EBO}	8 (<15)	pF
NF	1.2 (<2)	dB
NF	<4	dB
NF	<2	dB
NF	<2	dB
NF	<3	dB

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	<0.11	μV
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Test circuit for noise voltage measurement

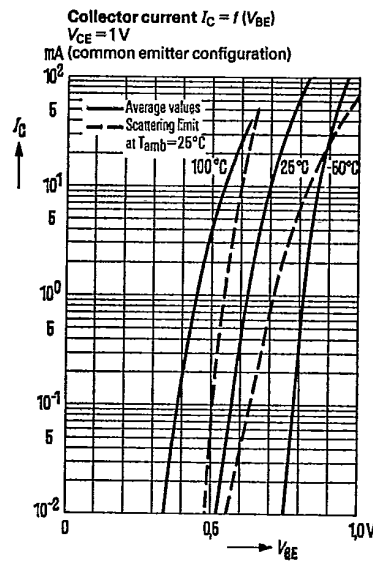
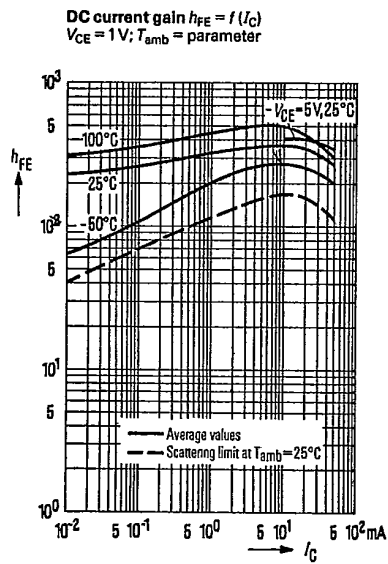
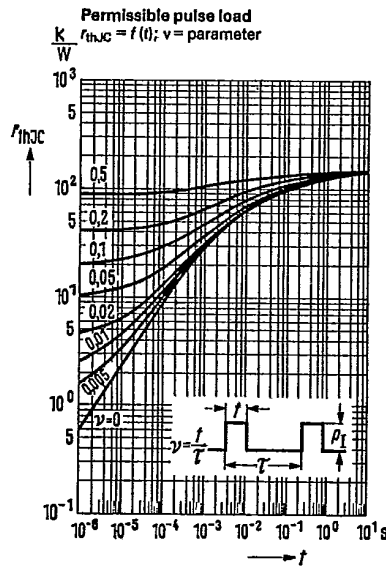
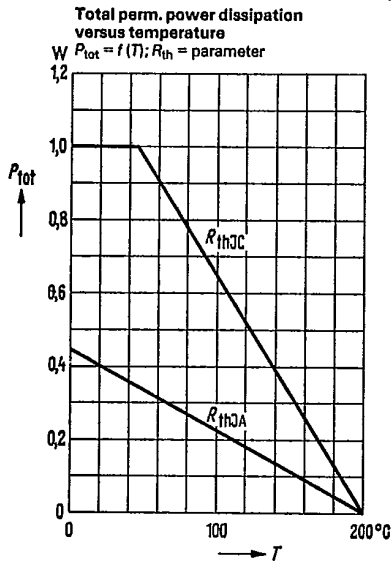


Four-pole characteristics ($I_C = 2\text{ mA}; V_{CE} = 5\text{ V}; f = 1\text{ kHz}$)

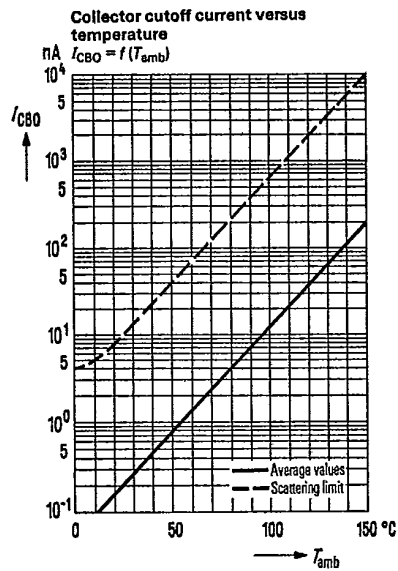
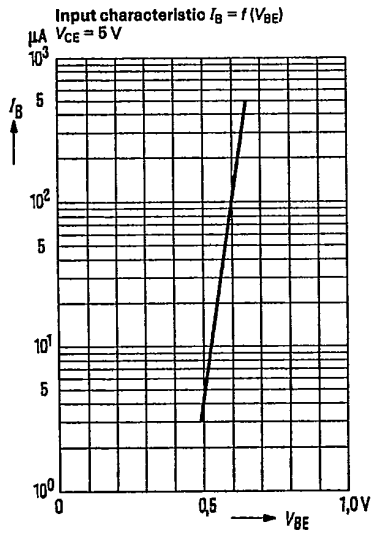
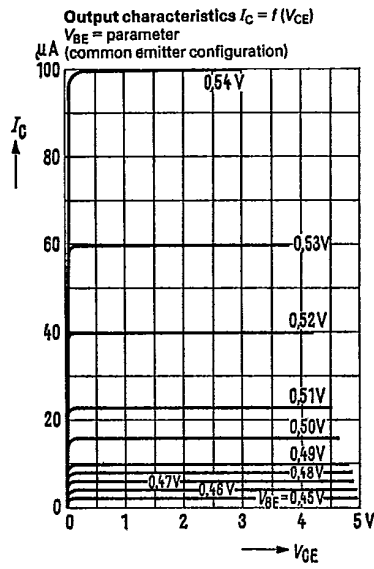
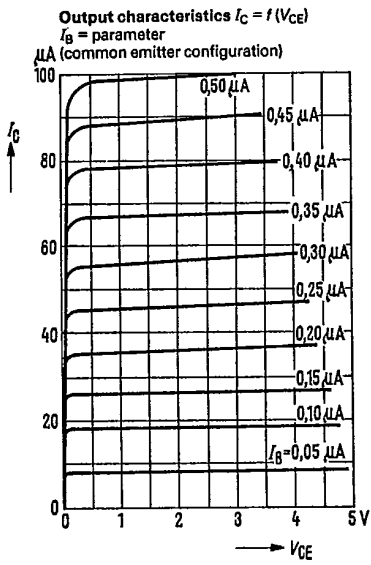
h_{11e}	4.5 (2.5 to 12)	$\text{k}\Omega$
h_{12e}	2	10^{-4}
h_{21e}	330	-
h_{22e}	30 (<100)	μS

* AQL = 0.65%

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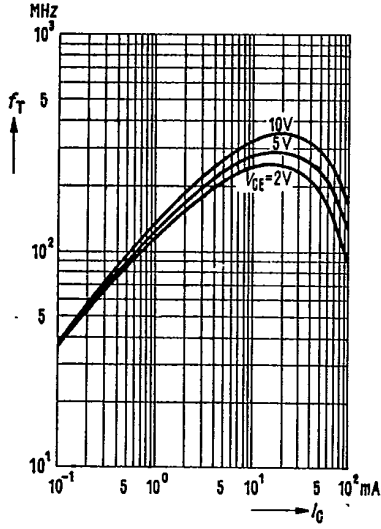


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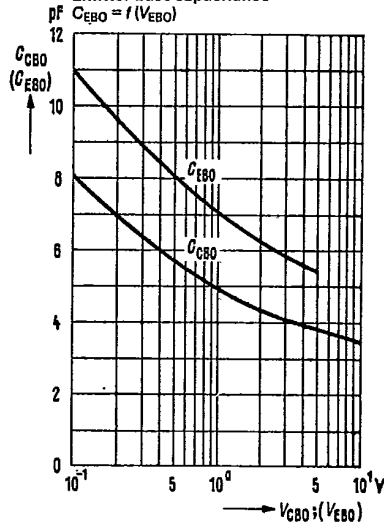


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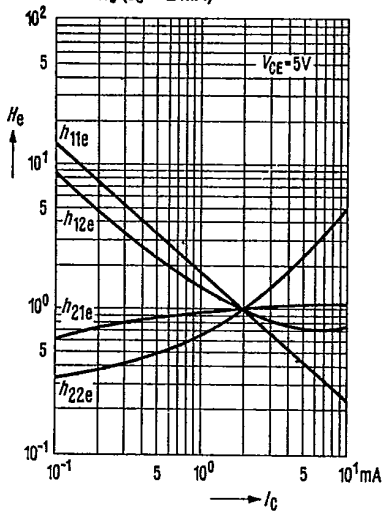
Transition frequency $f_T = f(I_C)$
 $V_{CE} = \text{parameter}$



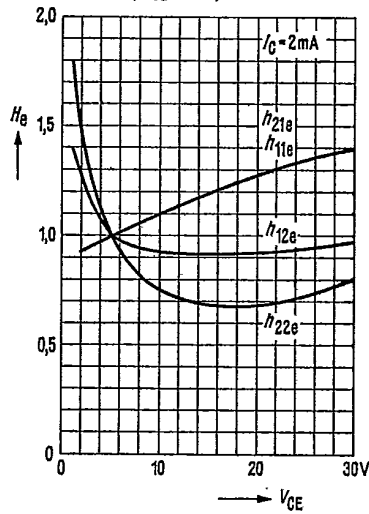
Collector-base capacitance
 $C_{CBO} = f(V_{CBO})$
Emitter-base capacitance
 $C_{EBO} = f(V_{EBO})$



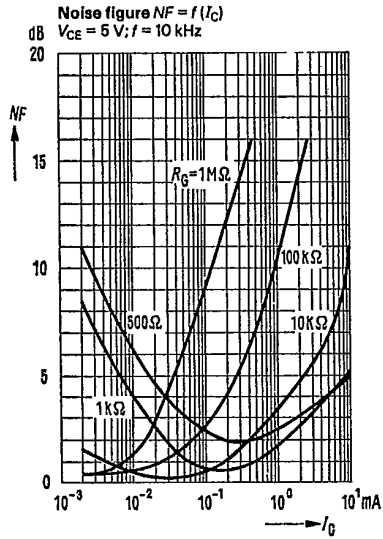
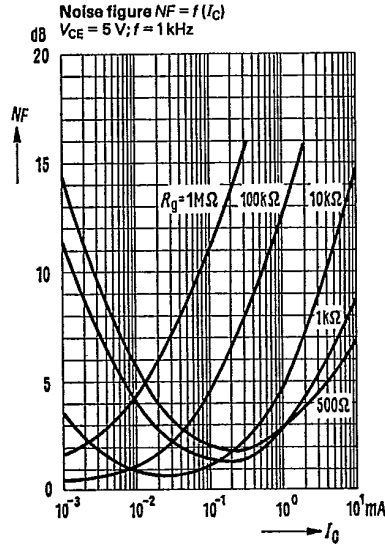
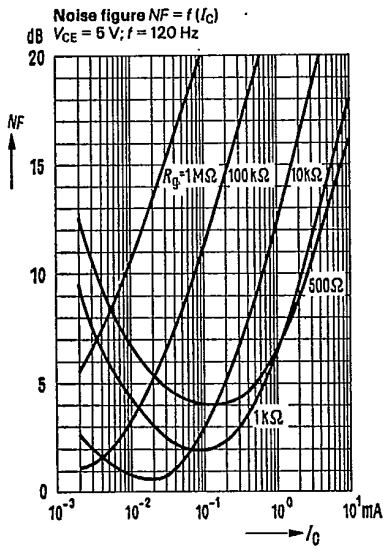
h -parameter versus collector current
 $H_o = \frac{h_o(I_C)}{h_o(I_C = 2 \text{ mA})} = f(I_C)$



h -parameter versus collector-emitter voltage
 $H_o = \frac{h_o(V_{CE})}{h_o(V_{CE} = 5 \text{ V})} = f(V_{CE})$

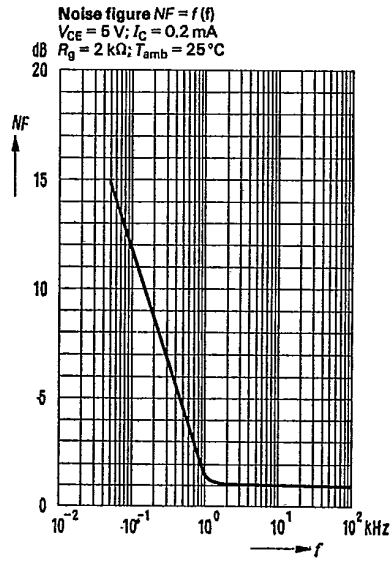
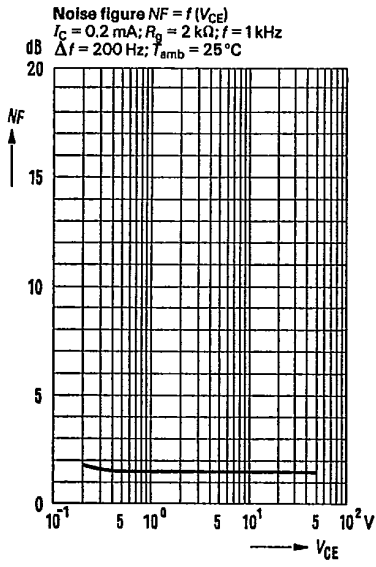


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