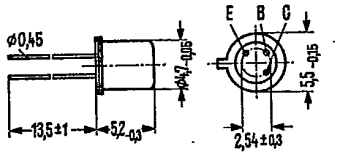
PNP Silicon Planar Transistor

BCY 67

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 °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 °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 (<0.25)	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.

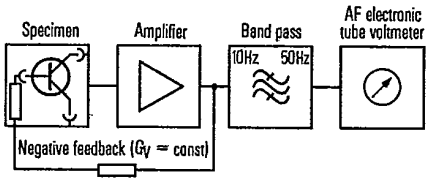
Static characteristics (T_{amb} = 25 °C)

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

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

Transition frequency ($-I_C$ = 10 mA; $-V_{CE}$ = 5 V)	f_T	180	MHz
Collector-base capacitance ($-V_{CBO}$ = 10 V; f = 1 MHz)	C_{CBO}	4.5 (<7)	pF
Emitter-base capacitance ($-V_{EBO}$ = 0.5 V)	C_{EBO}	11 (<15)	pF
Noise figure $-I_C$ = 0.2 mA; $-V_{CE}$ = 5 V; R_g = 2 kΩ; f = 1 kHz; Δf = 200 Hz	NF	1.2 (<2)	dB
$-I_C$ = 20 µA; $-V_{CE}$ = 5 V; R_g = 10 kΩ; f = 100 Hz	NF	<4	dB
$-I_C$ = 20 µA; $-V_{CE}$ = 5 V; R_g = 10 kΩ; f = 1 kHz	NF	<2	dB
$-I_C$ = 20 µA; $-V_{CE}$ = 5 V; R_g = 10 kΩ; f = 10 kHz	NF	<2	dB
$-I_C$ = 200 µA; $-V_{CE}$ = 5 V; R_g = 2 kΩ; Δf = 15.7 kHz	NF	<3	dB
Equivalent, base referred noise voltage (I_C = 0.2 mA; V_{CE} = 5 V; R_g = 2 kΩ; f = 10 to 50 Hz)	E_n	<0.135	µV

Test circuit for noise voltage measurement



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

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

* AQL = 0.65%

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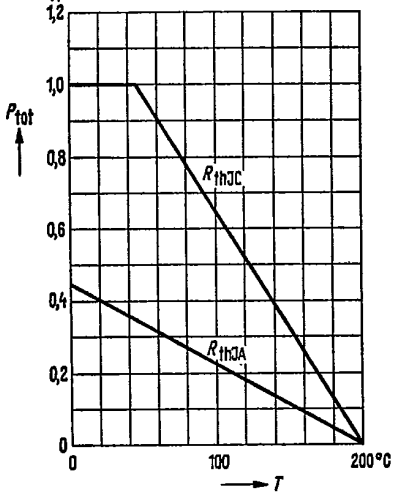
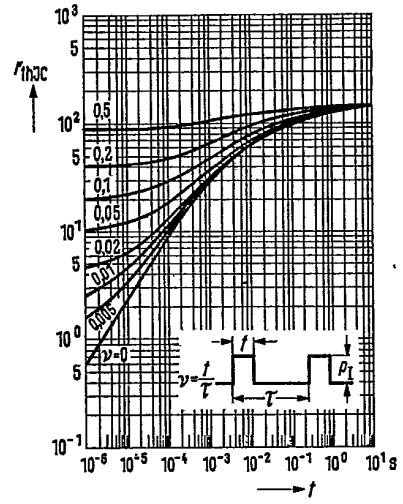
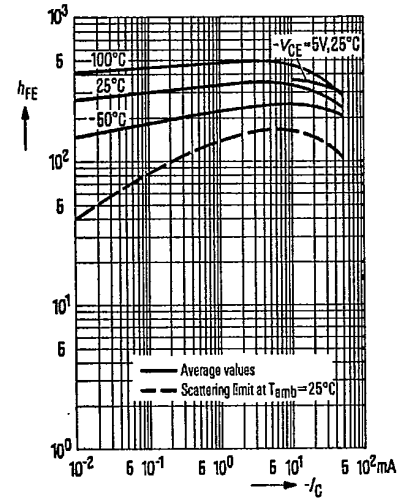
Total perm. power dissipation versus temperature
W $P_{tot} = f(T)$; R_{th} = parameter



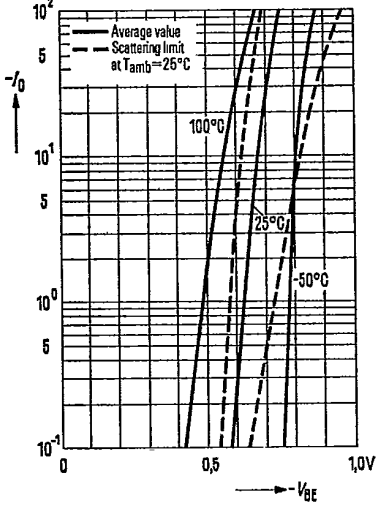
Permissible pulse load
K/W $r_{thJC} = f(t)$; v = parameter



DC current gain $h_{FE} = f(I_C)$
T_{amb} = parameter, $-V_{CE} = 1$ V



Collector current $I_C = f(V_{BE})$;
mA T_{amb} = parameter; $V_{CE} = 1$ V



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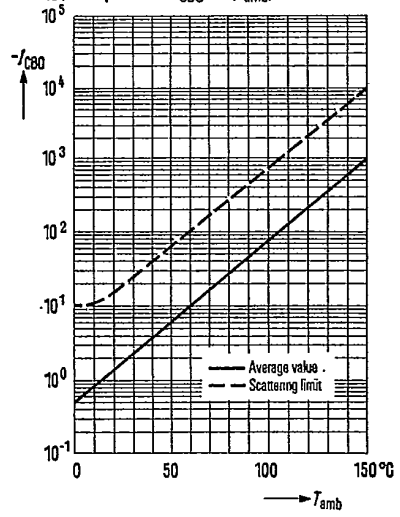
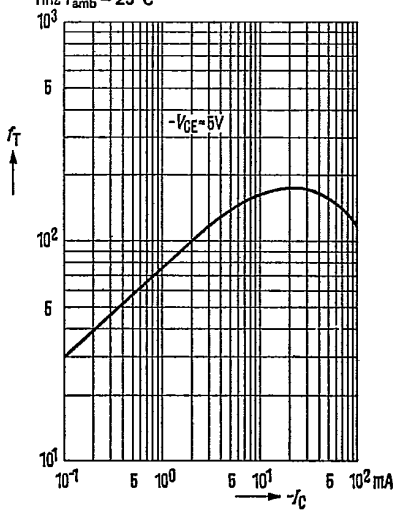
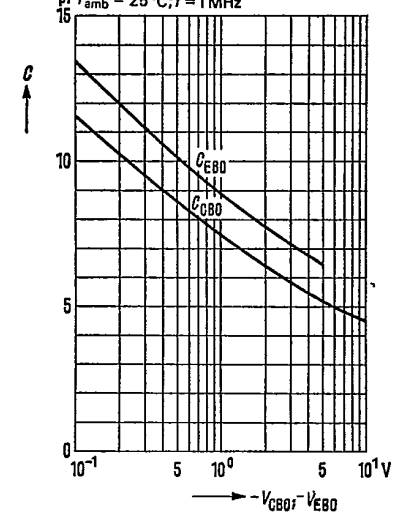
Collector cutoff current versus temperature $I_{CBO} = f(T_{amb})$



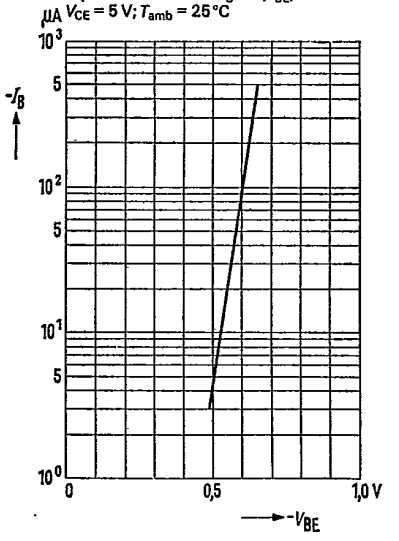
Transition frequency $f_T = f(I_C)$; MHz $T_{amb} = 25$ °C



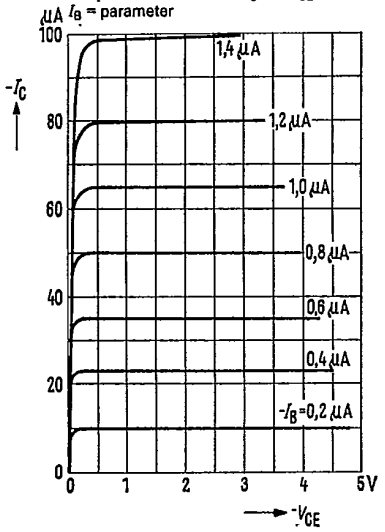
Collector-base capacitance $C_{CBO} = f(V_{CBO})$
Emitter-base capacitance $C_{EBO} = f(V_{EBO})$
pF $T_{amb} = 25$ °C; $f = 1$ MHz



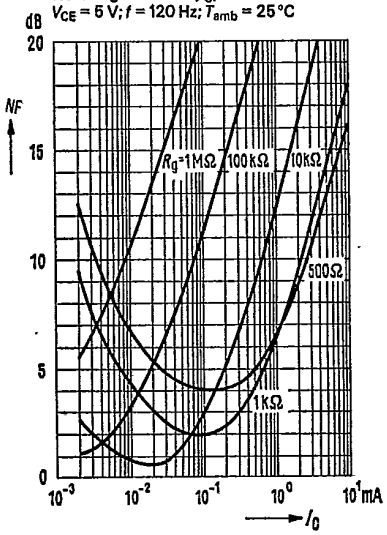
Input characteristic $I_B = f(V_{BE})$
μA $V_{CE} = 5$ V; $T_{amb} = 25$ °C



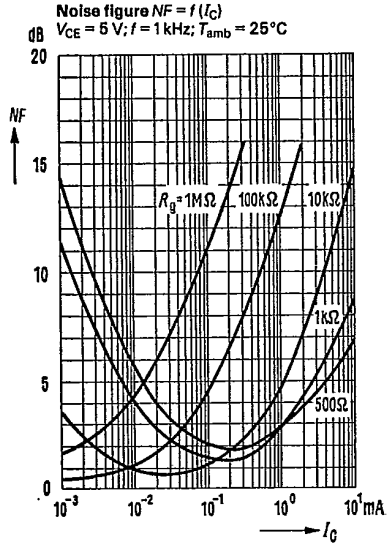
Output characteristics $I_C = f(V_{CE})$
I_B = parameter



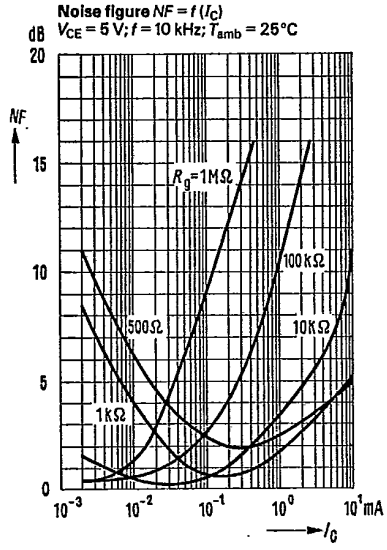
Noise figure $NF = f(I_C)$
V_{CE} = 5 V; f = 120 Hz; T_{amb} = 25 °C



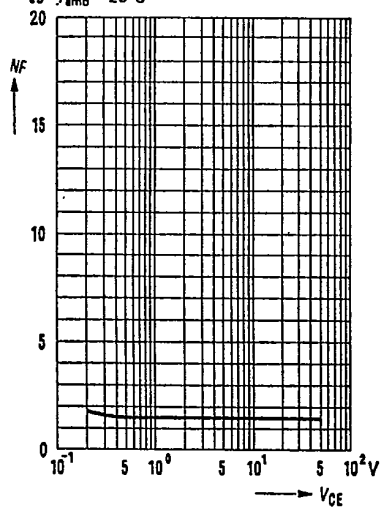
Noise figure $NF = f(I_C)$
V_{CE} = 5 V; f = 1 kHz; T_{amb} = 25 °C



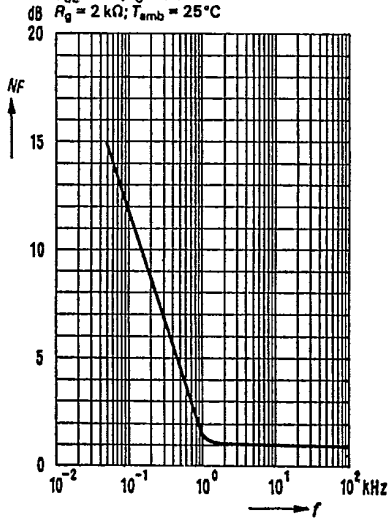
Noise figure $NF = f(I_C)$
V_{CE} = 5 V; f = 10 kHz; T_{amb} = 25 °C



Noise figure $NF = f(V_{CE})$
$I_C = 0.2$ mA; $R_g = 2$ kΩ; $f = 1$ kHz
$T_{amb} = 25$ °C

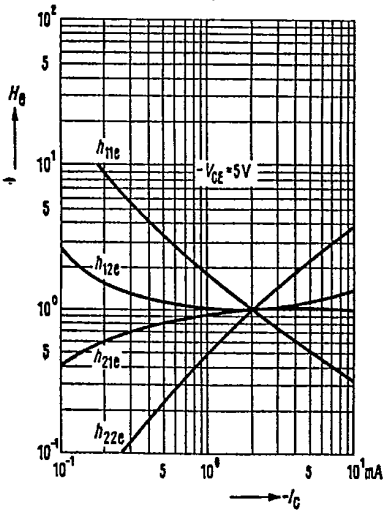


Noise figure $NF = f(f)$
$V_{CE} = 5$ V; $I_C = 0.2$ mA
$R_g = 2$ kΩ; $T_{amb} = 25$ °C



h-parameter versus collector current

$$H_e = \frac{h_e\,(I_C)}{h_e\,(I_C = 2\text{ mA})} = f\,(I_C)$$



h-parameter versus collector-emitter voltage

$$H_e = \frac{h_e\,(V_{CE})}{h_e\,(V_{CE} = 5\text{ V})} = f\,(V_{CE})$$