

PNP Silicon Planar Transistor

BCY 67

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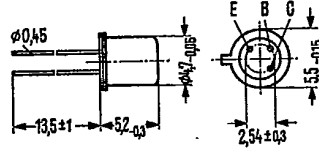
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BCY 67 is an epitaxial PNP silicon planar transistor in TO 18 case (18 A 3 DIN 41876). The collector is electrically connected to the case. The transistor is particularly provided for low-noise AF input stages. The complementary transistor is BCY 66.

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 ( $T_{case} = 45^\circ C$ )	$P_{tot}$	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 <sup>1)</sup>	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.

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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	$\mu\text{A}$
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

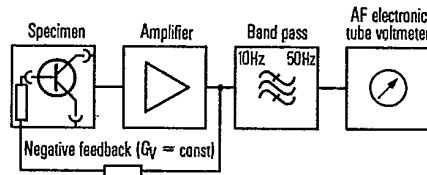
Dynamic characteristics ( $T_{amb} = 25^{\circ}\text{C}$ )

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	$\mu\text{V}$
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Test circuit for noise voltage measurement



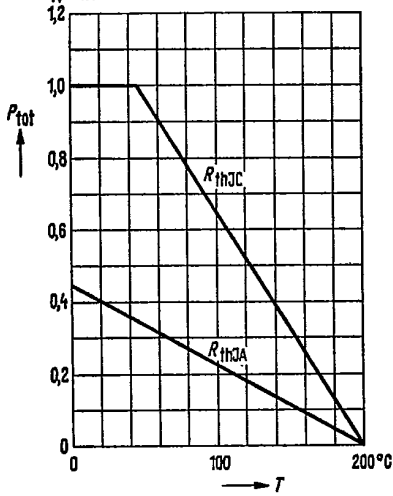
Four-pole characteristics ( $-I_C = 2\text{ mA}; -V_{CE} = 5\text{ V}; f = 1\text{ kHz}$ )

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

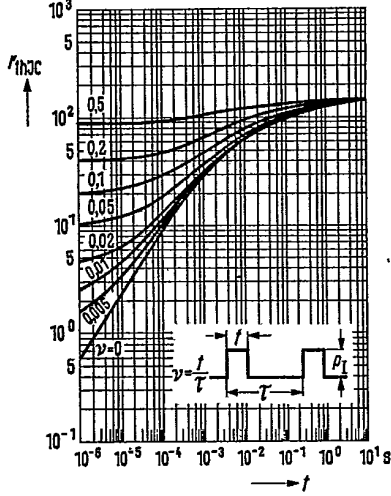
\*AQL = 0.65%

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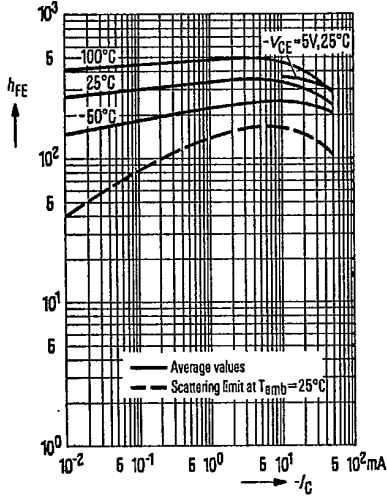
**Total perm. power dissipation versus temperature**  
 $P_{tot} = f(T); R_{th} = \text{parameter}$



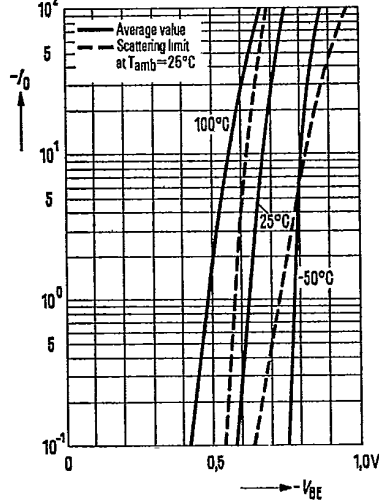
**K Permissible pulse load**  
 $W_{thJC} = f(t); v = \text{parameter}$



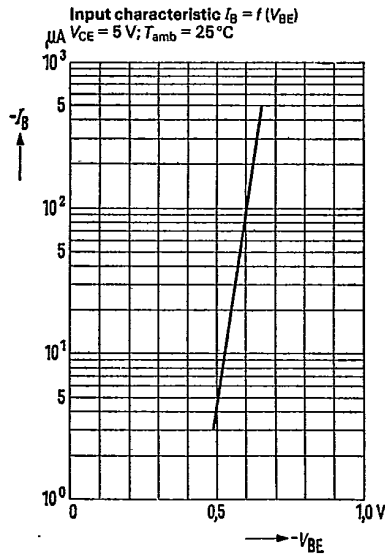
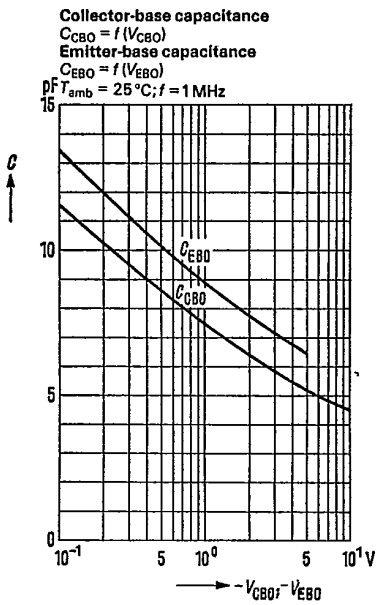
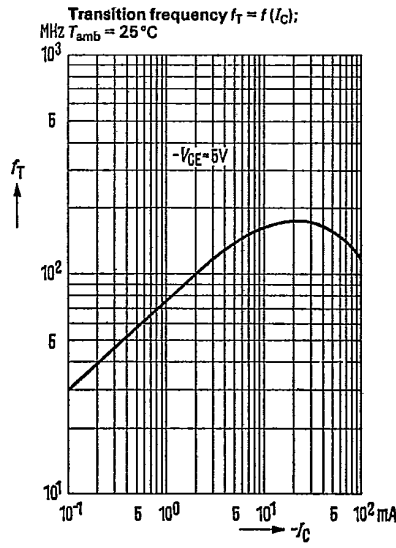
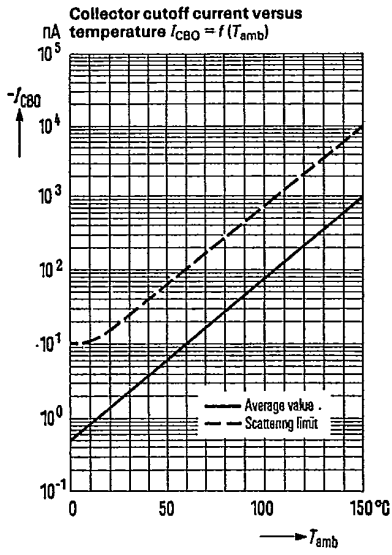
**DC current gain  $h_{FE} = f(I_C)$**   
 $T_{amb} = \text{parameter}, -V_{CE} = 1V$



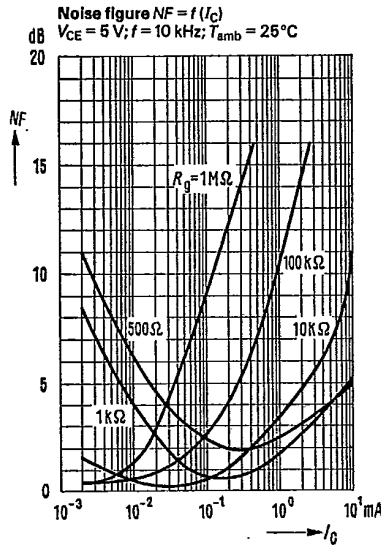
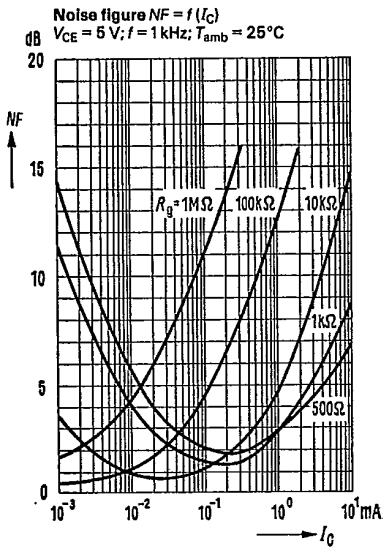
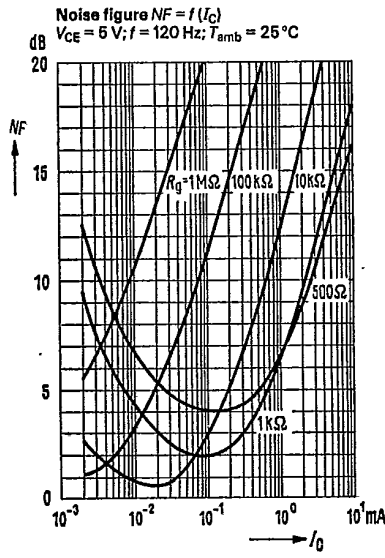
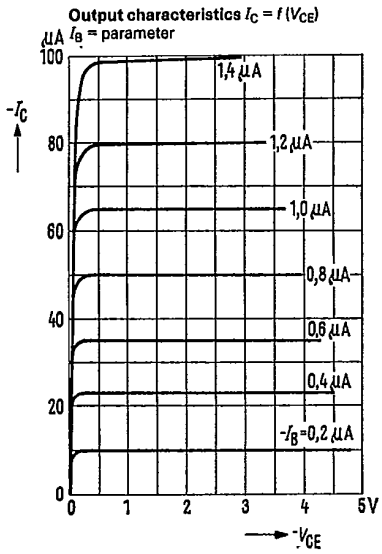
**Collector current  $I_C = f(V_{BE})$**   
 $T_{amb} = \text{parameter}; V_{CE} = 1V$

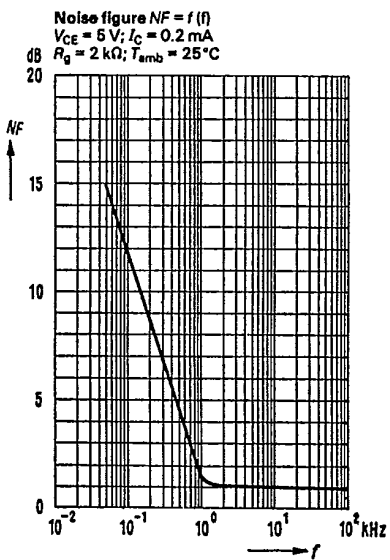
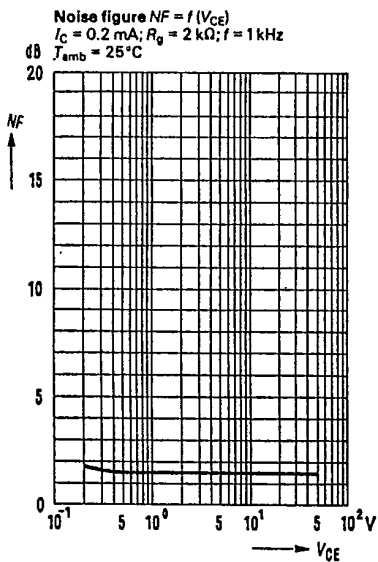


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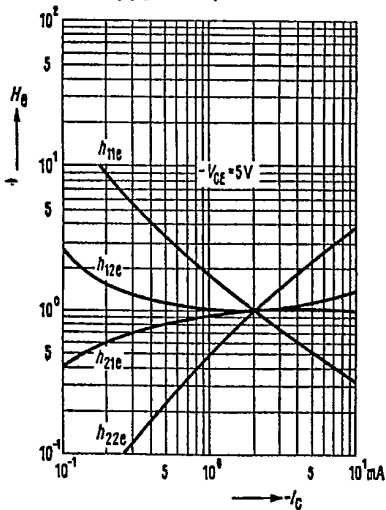
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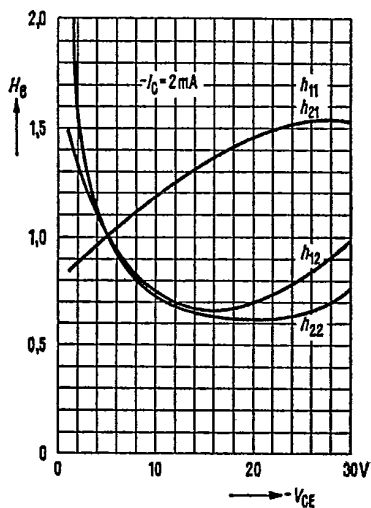
*h*-parameter versus collector current

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



*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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