

356-529



2

**BC182
BC183
BC184**

CASE 29-02, STYLE 17
TO-92 (TO-226AA)

AMPLIFIER TRANSISTORS

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	8C182	8C183	8C184	Unit
Collector-Emitter Voltage	V_{CE0}	50	30	30	Vdc
Collector-Base Voltage	V_{CB0}	60	45	45	Vdc
Emitter-Base Voltage	V_{EB0}	6.0			Vdc
Collector Current - Continuous	I_C	100			mA _{dc}
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350			mW
		2.8			mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0			Watt
		8.0			mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150			$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$

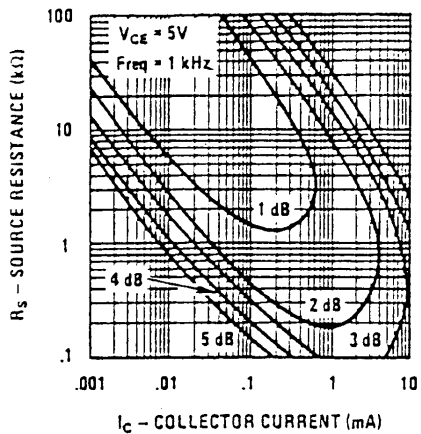
Refer to BC237 for graphs.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

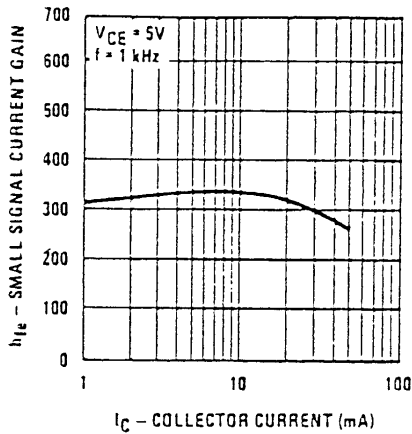
Characteristic	Type	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage ($I_C = 2.0\text{ mA}, I_B = 0$)	BC182 BC183 BC184	$V_{(BR)CEO}$	50 30 30	— — —	— — —	V
Collector-Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}, I_E = 0$)	BC182 BC183 BC184	$V_{(BR)CB0}$	60 45 45	— — —	— — —	V
Emitter-Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}, I_C = 0$)		$V_{(BR)EB0}$	6.0	—	—	V
Collector Cutoff Current ($V_{CB} = 50\text{ V}, V_{BE} = 0$) ($V_{CB} = 30\text{ V}, V_{BE} = 0$)	BC182 BC183 BC184	I_{CBO}	— — —	0.20 0.20 0.20	15 15 15	nA
($V_{CB} = 50\text{ V}, V_{BE} = 0$) $T_A = 125^\circ\text{C}$ ($V_{CB} = 30\text{ V}, V_{BE} = 0$) $T_A = 125^\circ\text{C}$	BC182 BC183 BC184		— — —	0.20 0.20 0.20	4 4 4	μA
Emitter-Base Leakage Current ($V_{EB} = 4\text{ V}, I_C = 0$)		I_{EB0}	—	—	15	nA
ON CHARACTERISTICS						
DC Current Gain ($I_C = 10\text{ }\mu\text{A}, V_{CE} = 5\text{ V}$)	BC182 BC183 BC184	h_{FE}	40 40 100	— — —	— — —	
($I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$)	BC182 BC183 BC184		100 100 250	— — —	480 850 850	
($I_C = 100\text{ mA}, V_{CE} = 5\text{ V}$)	BC182 BC183 BC184		30 30 130	— — —	— — —	
Collector-Emitter On Voltage ($I_C = 10\text{ mA}, I_B = 5\text{ mA}$) ($I_C = 100\text{ mA}, I_B = 5\text{ mA}$)*		$V_{CE(sat)}$	— —	0.07 0.20	0.25 0.60	V
Base-Emitter Saturation Voltage ($I_C = 100\text{ mA}, I_B = 5\text{ mA}$)		$V_{BE(sat)}$	—	1.05	—	V
Base-Emitter On Voltage ($I_C = 100\text{ }\mu\text{A}, V_{CE} = 5\text{ V}$) ($I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$) ($I_C = 100\text{ mA}, V_{CE} = 5\text{ V}$)		$V_{BE(on)}$	— 0.55 —	0.50 0.52 0.83	— 0.70 —	V

*Pulse-test: T_p 300 s, Duty-cycle 2%.

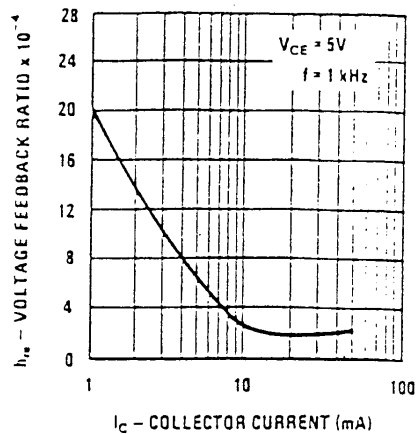
Contours of Constant Narrow Band Noise Figure



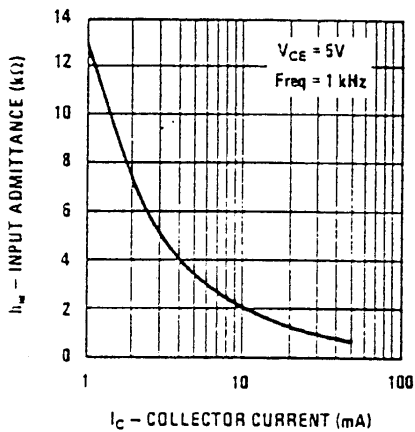
Small Signal Current Gain



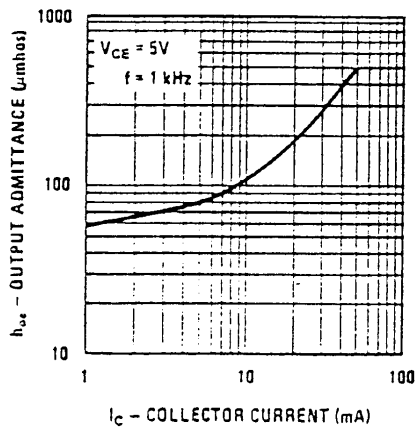
Voltage Feedback Ratio



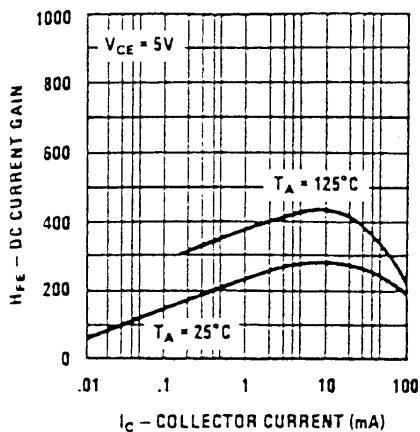
Input Admittance



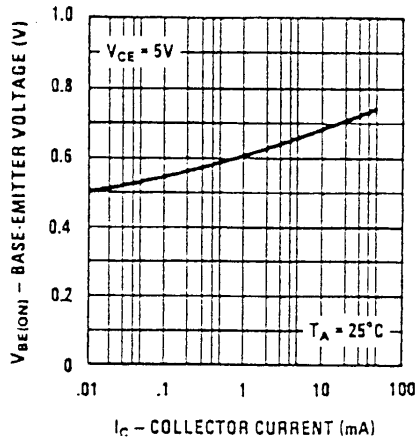
Output Admittance



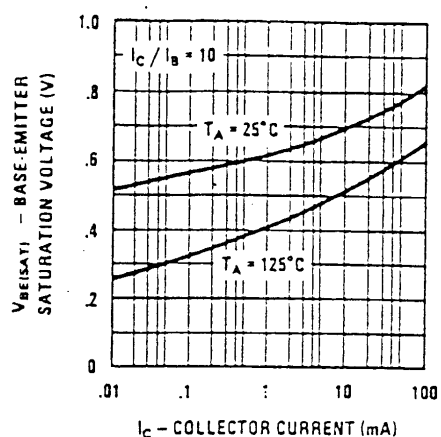
DC Current Gain vs Collector Current



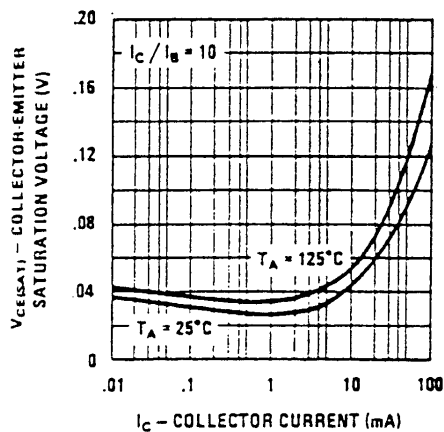
Base-Emitter ON Voltage vs Collector Current



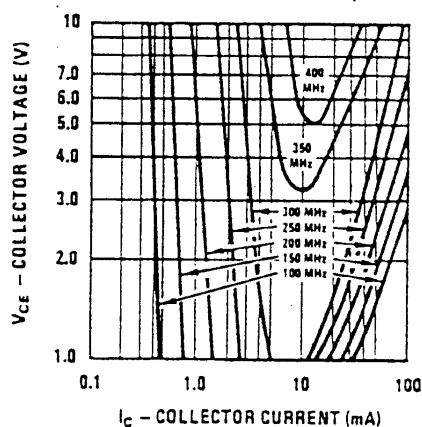
Base-Emitter Saturation Voltage vs Collector Current



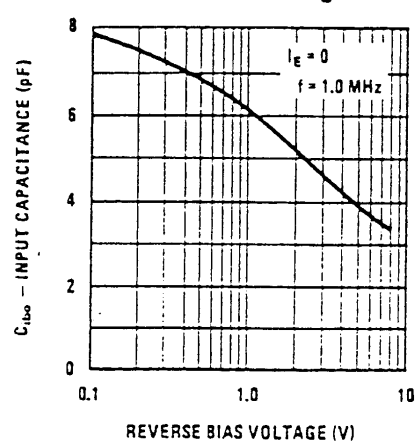
Collector-Emitter Saturation Voltage vs Collector Current



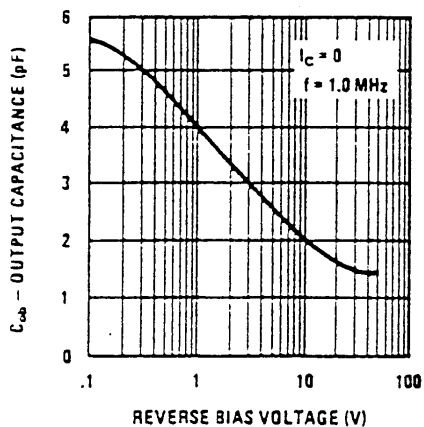
Contours of Constant Gain Bandwidth Product (f_T)



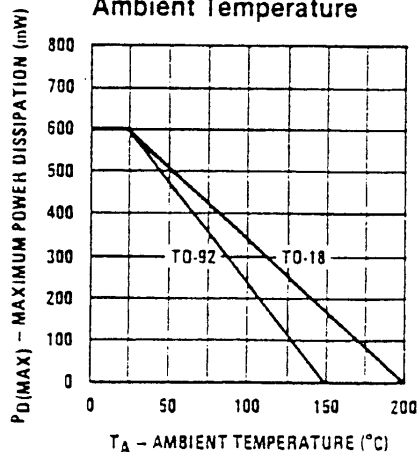
Input Capacitance vs Reverse Bias Voltage



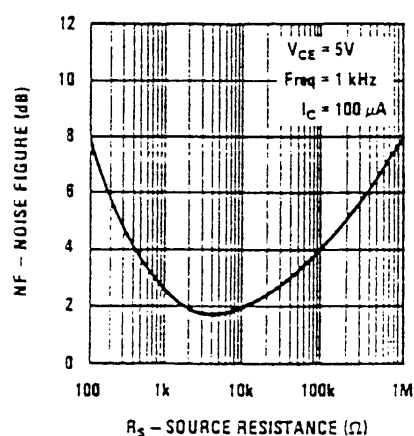
Output Capacitance vs Reverse Bias Voltage



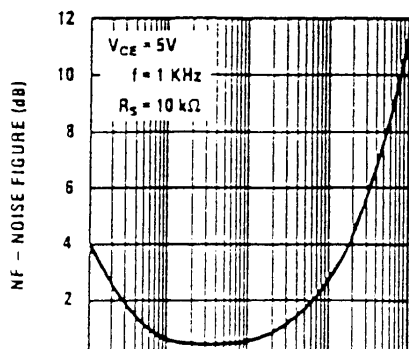
Maximum Power Dissipation vs Ambient Temperature



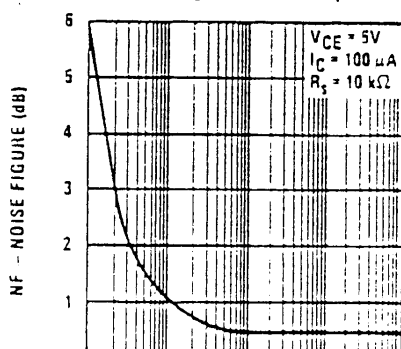
Noise Figure vs Source Resistance



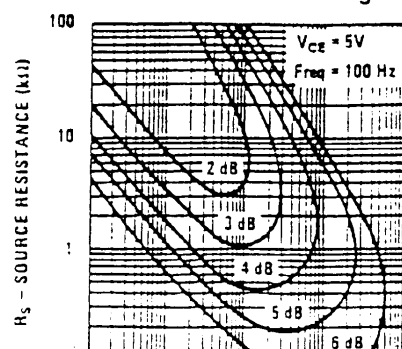
Noise Figure vs Collector Current



Noise Figure vs Frequency



Contours of Constant Narrow Band Noise Figure

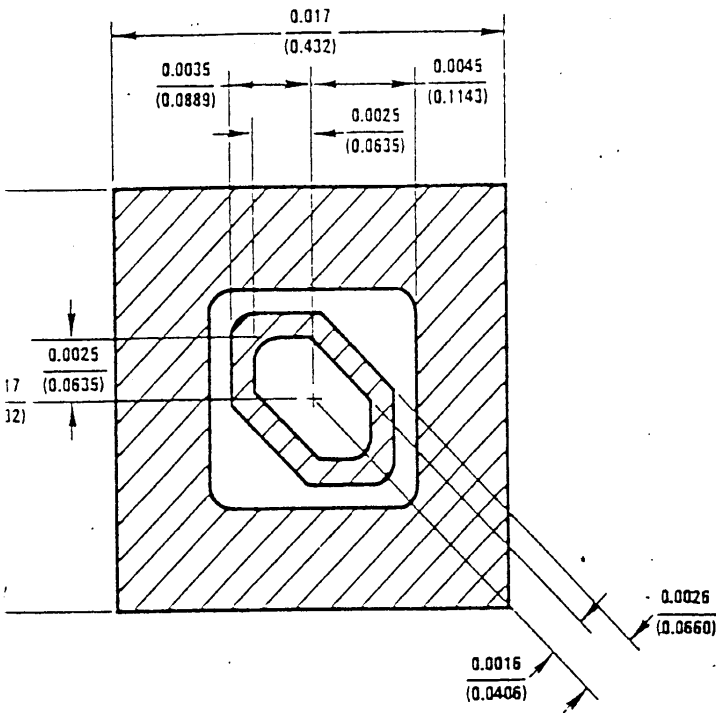


BC182, BC183, 3C184

ELECTRICAL CHARACTERISTICS (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Type	Symbol	Min	Typ.	Max.	Unit	
DYNAMIC CHARACTERISTICS							
Current Gain Bandwidth Product ($I_C = 0.5\text{ mA}$, $V_{CE} = 3\text{ V}$, $f = 100\text{ MHz}$)	BC182	f_T	—	100	—	MHz	
	BC183		—	120	—		
(IC = 10 mA, $V_{CE} = 5\text{ V}$, $f = 100\text{ MHz}$)	BC184		—	140	—		
	BC182		150	200	—		
	BC183		150	240	—		
BC184		150	280	—			
Common Base Output Capacitance ($V_{CB} = 10\text{ V}$, $I_C = 0$, $f = 1\text{ MHz}$)		C_{ob}	—	—	5.0	pF	
Common Base Input Capacitance ($V_{BE} = 0.5\text{ V}$, $I_C = 0$, $f = 1\text{ MHz}$)		C_{ib}	—	8.0	—	pF	
Input Impedance ($I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ KHz}$)	BC182	h_{ie}	1.6	2.2	4.5	Kohm	
	BC183		3.2	6.0	8.5		
	BC184		6.0	8.7	15.0		
Voltage Feedback Ratio ($I_C = 2\text{ mA}$, $V_{CE} = 5$, $f = 1\text{ KHz}$)	BC182	h_{re}	—	1.5	—	$\times 10^{-4}$	
	BC183		—	2.0	—		
	BC184		—	3.0	—		
Small-Signal Current Gain ($I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ KHz}$)	BC182	h_{fe}	125	—	500		
	BC183		125	—	900		
	BC184		240	—	900		
	BC182A, BC183A		125	—	260		
	BC182B, BC183B, BC184B		240	—	500		
BC183C, BC184C	450	—	900				
Output Admittance ($I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ KHz}$)	BC182	h_{oe}	—	8	25	μmhos	
	BC183		—	10	35		
	BC184		—	12	50		
Noise Figure ($I_C = 0.2\text{ mA}$, $V_{CE} = 5\text{ V}$, $R_S = 2\text{ Kohms}$, $f = 30\text{ Hz}$ to 15 KHz)	BC184	NF	—	2	4	dB	
	BC182		—	2	10		
			BC183	—	2		10
			BC184	—	2		4

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DESCRIPTION

Process 04 is a non-overlay, double-diffused, silicon epitaxial device. Complement to Process 71.

APPLICATION

This device was designed for low noise, high gain, general purpose amplifier applications from 10 μ A to 100 mA collector current.

PRINCIPAL DEVICE TYPES

- TO-18: BC107 Series
- TO-92, ECB: 2N2923 Series
2N5172
- TO-92, EBC: MPS2923 Series

Parameter	Conditions	Min	Typ	Max	Units	Notes
NF (spot)	$I_C = 200 \mu\text{A}$, $V_{CE} = 5\text{V}$, $f = 1 \text{ kHz}$, $R_S = 2\text{k}$		2.0	4.0	dB	TO-18
C_{ob}	$V_{CB} = 10\text{V}$, $f = 1 \text{ MHz}$		2.5	3.5	pF	
C_{ib}	$V_{EB} = 0.5\text{V}$, $f = 1 \text{ MHz}$			10	pF	
f_T	$V_{CE} = 5\text{V}$, $I_C = 10 \text{ mA}$	125	250		MHz	
h_{FE}	$V_{CE} = 5\text{V}$, $I_C = 100 \mu\text{A}$	50				
h_{FE}	$V_{CE} = 5\text{V}$, $I_C = 2 \text{ mA}$	75	250	600		
h_{FE}	$V_{CE} = 5\text{V}$, $I_C = 100 \text{ mA}$	40				
h_{FE}	$V_{CE} = 1\text{V}$, $I_C = 100 \text{ mA}$	25				
$V_{CE(SAT)}$	$I_C = 10 \text{ mA}$, $I_B = 1 \text{ mA}$			0.2	V	
$V_{CE(SAT)}$	$I_C = 100 \text{ mA}$, $I_B = 10 \text{ mA}$			0.5	V	
$V_{BE(SAT)}$	$I_C = 10 \text{ mA}$, $I_B = 1 \text{ mA}$			0.85	V	
$V_{BE(SAT)}$	$I_C = 100 \text{ mA}$, $I_B = 10 \text{ mA}$			0.95	V	
BV_{CBO}	$I_C = 10 \mu\text{A}$	45			V	
BV_{CEO}	$I_C = 10 \text{ mA}$	35			V	
BV_{EBO}	$I_E = 10 \mu\text{A}$	7.0			V	
I_{CBO}	$V_{CB} = 40\text{V}$			100	nA	
I_{EBO}	$V_{EB} = 6\text{V}$			100	nA	

PRO 150B

PRO ELECTRON SERIES (Continued)

Case Style	V _{CE5} [*] V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CB0} [*] I _{CB0} (mA) Max	HFE h _{fe} 1 kHz Min Max	I _C & V _{CE} (mA) (V) Min Max	V _{CE(SAT)} (V) Max	V _{BE(SAT)} & V _{BE(ON)} [*] (V) Min Max	I _C (mA) Min Max	C _{inh} (pF) Max	f _T (MHz) Min Max	I _C (mA) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
TO-18	25	20	5	100	110 240	2 500*	0.18	0.78 0.75* 1.0*	10 2	4.5	150	10		4	1	71
TO-92 (97)	60	50	5	15	40 80 125	0.01 100 500*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (97)	60	50	5	15	40 80 125	0.01 100 260*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (97)	60	50	5	15	40 80 240	0.01 100 500*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (94)	60	50	5	15	40 80 125	0.01 100 500*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (94)	60	50	5	15	40 80 125	0.01 100 260*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (97)	45	30	5	15	40 80 125	0.01 100 900*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (97)	45	30	5	15	40 80 240	0.01 100 500*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (97)*	45	30	5	15	40 80 240	0.01 100 500*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04
TO-92 (97)	45	30	5	15	40 80 450	0.01 100 900*	0.6 0.25	1.2 0.55 0.70*	10 10 2	5	150	10		10	1	04

CONDITIONS:
 (1) I_C = 100 mA, V_{CE} = 5V, f = 1 kHz. (2) I_C = 100 mA, V_{CE} = 20V, I_B¹ = I_B² = 5 mA. (3) I_C = 200 μA, V_{CE} = 2V, f = 1 kHz. (4) I_C = 100 mA, V_{CE} = 10V, I_B¹ = I_B² = 10 mA. (5) I_C = 10 mA, V_{CE} = 3V, f = 100 μA. (6) I_C = 100 μA, V_{CE} = 5V, f = 1 kHz. (7) I_C = 1 mA, V_{CE} = 10V, f = 200 kHz. (8) I_C = 1 mA, V_{CE} = 5V, f = 1 kHz. (9) I_C = 150 mA, V_{CE} = 6V, I_B¹ = I_B² = 15 mA. (10) I_C = 10 μA, V_{CE} = 10V, f = 100 μA.