MICRO ELECTRONICS

BC107,8,9
BC167,8,9
BC237,8,9
BC317,8,9

THE ABOVE TYPES ARE NPN SILICON PLANAR EPITAXIAL TRANSISTORS FOR USE IN AF SMALL SIGNAL AMPLIFIER STAGES AND DIRECT COUPLED CIRCUITS.

BC107, 8, 9 are complementary to BC177, 8, 9.

BC167, 8, 9 are complementary to BC257, 8, 9.

BC237, 8, 9 are complementary to BC307, 8, 9.

BC317, 8, 9 are complementary to BC320, 1, 2.

CASE

TO-18	TO-92B	TO-92F	TO-92A
CBE	ECB	CEB	EBC
BC107,8,9	BC167,8,9	BC237,8,9	BC317,8,9

ABSOLUTE MAXIMUM RATINGS

TYPE	V_{CBO} (V)	V_{CES} (V)	V_{CEO} (V)	V_{EBO} (V)	$I_{C(DC)}$ (mA)	Ptot (mW) *	T_j, T_{stg}
BC107	50	50	45	6	100	300	-55 to 175°C
BC108	30	30	20	5	100	300	
BC109	30	30	20	5	100	300	
BC167	50	50	45	6	100	300	-55 to 150°C
BC168	30	30	20	5	100	300	
BC169	30	30	20	5	100	300	
BC237	50	50	45	6	100	300	-55 to 150°C
BC238	30	30	20	5	100	300	
BC239	30	30	20	5	100	300	
BC317	50		45	6	150	310	-55 to 150°C
BC318	45		30	5	150	310	
BC319	30		20	5	150	310	

* Total Power Dissipation @ $T_A \leq 25°C$

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	BV_{CBO}	Note 1			V	I_C=10μA I_E=0
Collector-Emitter Breakdown Voltage	LV_{CEO} *				V	I_C=2mA I_B=0
Emitter-Base Breakdown Voltage	BV_{EBO}				V	I_E=1μA I_C=0
Collector Cutoff Current	I_{CES}					
BC107, 108, 109 } only				15	nA	V_{CE}=V_{CES} V_{BE}=0
BC167, 168, 169 } only				4	μA	V_{CE}=V_{CES} V_{BE}=0 T_A=125°C
BC237, 238, 239 } only						
Collector Cutoff Current	I_{CBO}					
BC317, 318, 319 only				30	nA	V_{CB}=20V I_E=0
				15	μA	V_{CB}=20V I_E=0 T_A=100°C
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$*					
BC107, 108, 109 } only			0.07	0.25	V	I_C=10mA I_B=0.5mA
BC167, 168, 169 } only			0.22	0.6	V	I_C=100mA I_B=5mA
BC237, 238, 239 } only						
BC317, 318, 319 only	$V_{CE(sat)}$*		0.07	0.2	V	I_C=10mA I_B=0.5mA
			0.2	0.5	V	I_C=100mA I_B=5mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$*					
BC107, 108, 109 } only			0.7	0.83	V	I_C=10mA I_B=0.5mA
BC167, 168, 169 } only			0.9	1.05	V	I_C=100mA IB=5mA
BC237, 238, 239 } only						
Base-Emitter Voltage All types	V_{BE} *	0.55	0.63	0.7	V	I_C=2mA V_{CE}=5V
BC317, 318, 319 only			0.68	0.77	V	I_C=10mA V_{CE}=5V
Current Gain-Bandwidth Product	f_T					
BC107, 108, 109 } only		150	250		MHz	I_C=10mA V_{CE}=5V
BC167, 168, 169 } only						
BC237, 238, 239 } only						
Collector-Base Capacitance	Cob					V_{CB}=10V I_E=0
BC107, 108, 109			3.2	6.0	pF	f=1MHz
BC167, 168, 169			2.7	4.5	pF	
BC237, 238, 239			2.7	4.5	pF	
BC317, 318, 319			2.7	4.0	pF	
Noise Figure	NF					I_C=0.2mA V_{CE}=5V
BC107, 108			2	10	dB	R_G=2KΩ f=1kHz
BC167, 168			2	10	dB	Δf=200Hz
BC237, 238			2	10	dB	
BC317, 318			2	6	dB	

* Pulse Test : Pulse Width=0.3mS, Duty Cycle=1%

Note 1 : equal to the value of absolute maximum ratings.

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PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Noise Figure BC109 BC169 } only	NF		1.5	4	dB	I_C=0.2mA V_{CE}=5V R_G=2KΩ f=1kHz Δf=200Hz
BC239 BC319 } only			1.2	4	dB	I_C=0.2mA V_{CE}=5V R_G=2KΩ f=30Hz-15KHz

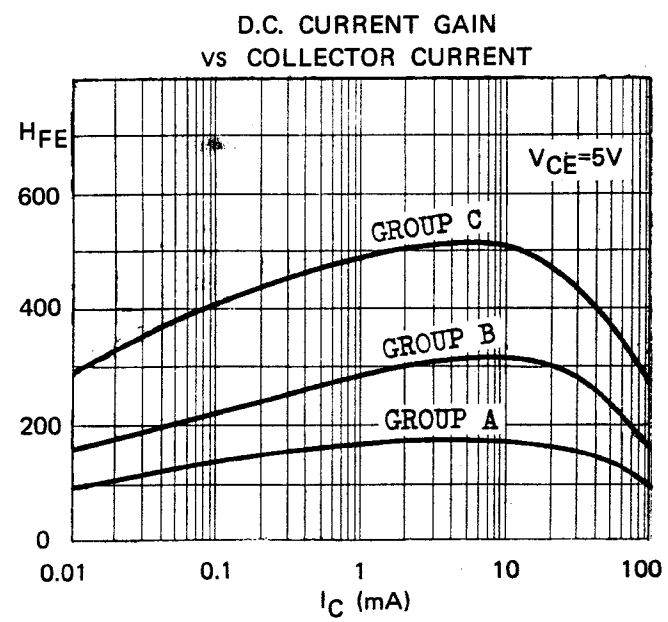
D.C. CURRENT GAIN (H_{FE}) @ V_{CE}=5V T_A=25°C

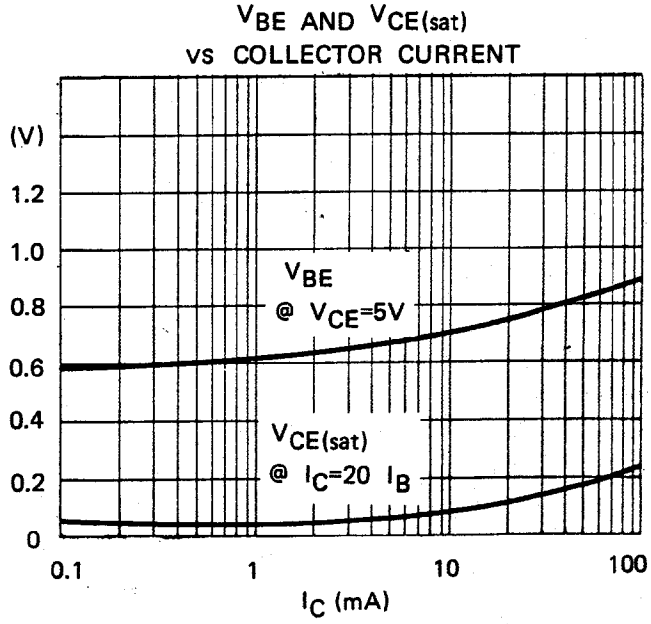
at I_C (Pulsed)	H_{FE} GROUP A			H_{FE} GROUP B			H_{FE} GROUP C		
	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
0.01mA	40	90		40	170		100	290	
2mA	110	170	220	200	300	450	420	520	800
100mA		100			160			270	

h-PARAMETERS @ I_C=2mA V_{CE}=5V f=1kHz T_A=25°C

h - PARAMETER	SYMBOL	H_{FE} GROUP A			H_{FE} GROUP B			H_{FE} GROUP C			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Input Impedance	h_{ie}	1.6	2.7	4.5	3.2	4.5	8.5	6	8.7	15	KΩ
Voltage Feedback Ratio	h_{re}		1.5			2			3		$x10^{-4}$
Small Signal Current Gain	h_{fe}	125	190	260	240	330	500	450	580	900	
Output Admittance	h_{oe}		18	30		30	60		60	110	μʊ

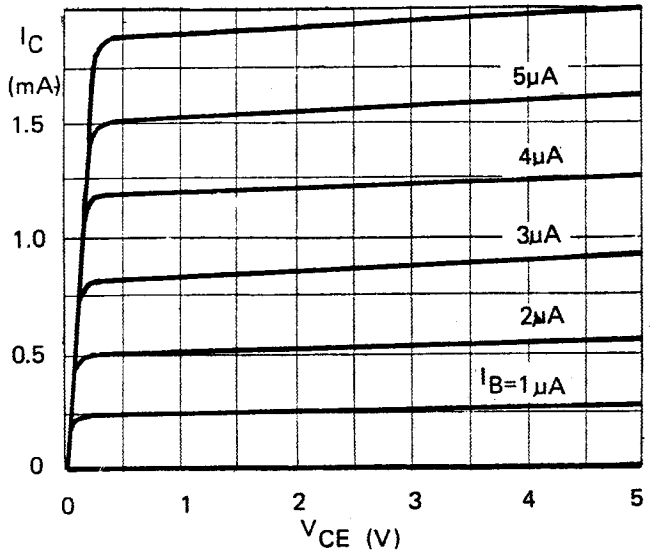
TYPICAL CHARACTERISTICS AT T_A=25°C (Pulse Test)



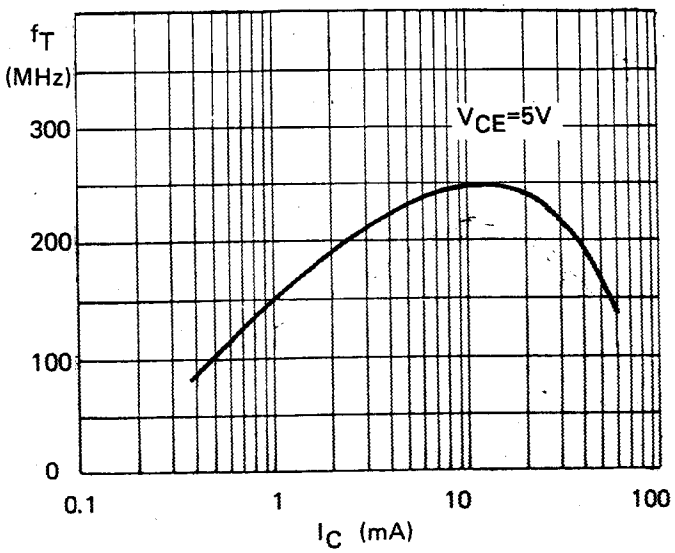


TYPICAL CHARACTERISTICS (T_A=25°C UNLESS OTHERWISE SPECIFIED)

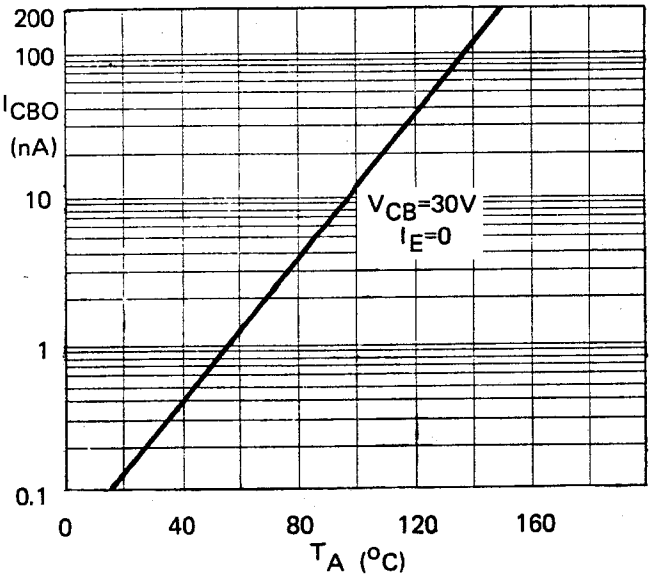
COMMON EMITTER
OUTPUT CHARACTERISTICS



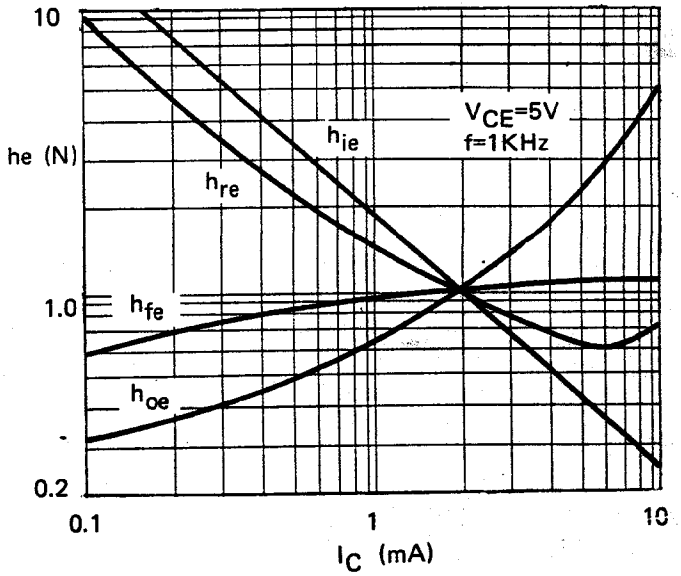
CURRENT GAIN – BANDWIDTH PRODUCT
VS COLLECTOR CURRENT



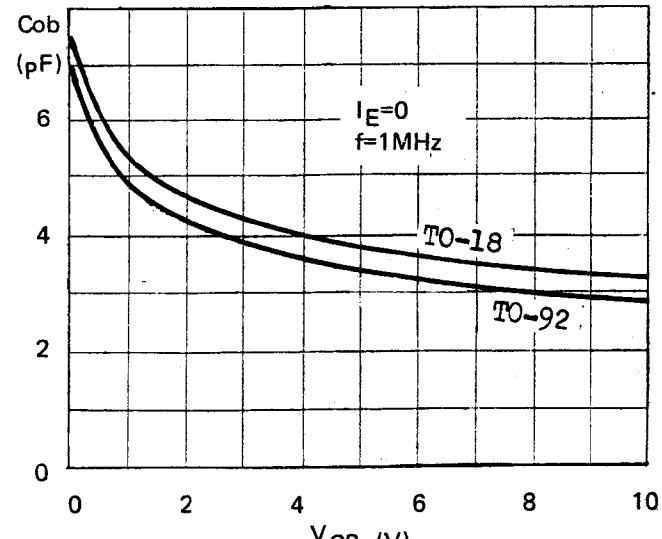
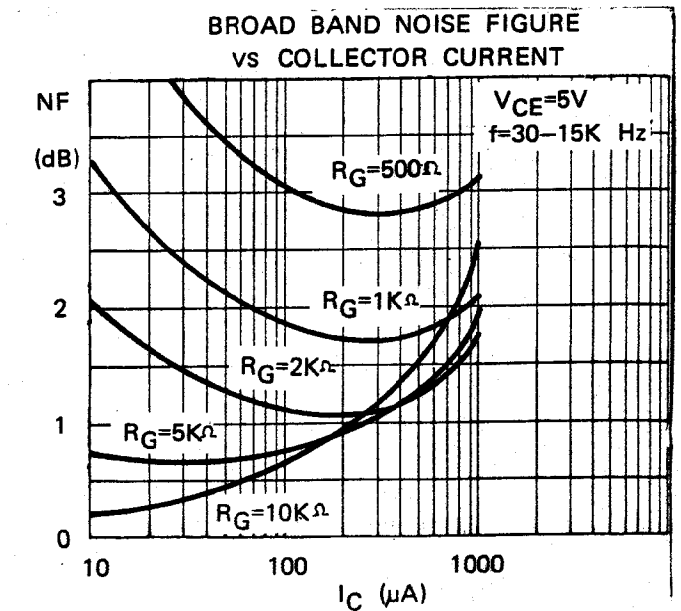
COLLECTOR CUTOFF CURRENT
VS AMBIENT TEMPERATURE



h–PARAMETERS (NORMALIZED)
VS COLLECTOR CURRENT



COLLECTOR–BASE CAPACITANCE
VS COLLECTOR–BASE VOLTAGE



BROAD BAND NOISE FIGURE
VS COLLECTOR CURRENT