BC 556 through BC 560

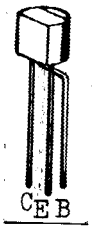
PNP SILICON AF SMALL SIGNAL TRANSISTORS

MICRO ELECTRONICS

THE BC556 THROUGH BC560 ARE PNP SILICON PLANAR EPITAXIAL TRANSISTORS FOR USE IN AF SMALL SIGNAL AMPLIFIER STAGES AND DIRECT COUPLED CIRCUITS. THEY ARE COMPLEMENTARY TO BC546 THROUGH BC550.

THE BC559, BC560 ARE CHARACTERIZED BY LOW NOISE FIGURE.

CASE TO-92F



ABSOLUTE MAXIMUM RATINGS		BC556	BC557	BC558	BC559	BC560
Collector-Base Voltage	$-V_{CBO}$	80V	50V	30V	30V	50V
Collector-Emitter Voltage (V_{BE}=0)	$-V_{CES}$	80V	50V	30V	30V	50V
Collector-Emitter Voltage (I_B=0)	$-V_{CEO}$	65V	45V	30V	30V	45V
Emitter-Base Voltage	$-V_{EBO}$			5V		
Collector Current	$-I_C$			100mA		
Collector Peak Current	$-I_{CM}$			200mA		
Total Power Dissipation ($T_A \leqslant 25^oC$)	P_{tot}			500mW derate 4mW/°C above 25°C		
Operating Junction & Storage Temperature	T_j, T_{stg}			-55 to 150°C		

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	$-BV_{CBO}$					$-I_C$=10μA I_E=0
BC556		80			V	
BC557		50			V	
BC558		30			V	
BC559		30			V	
BC560		50			V	
Collector-Emitter Breakdown Voltage	$-BV_{CES}$					$-I_C$=10μA V_{BE}=0
BC556		80			V	
BC557		50			V	
BC558		30			V	
BC559		30			V	
BC560		50			V	
Collector-Emitter Breakdown Voltage	$-LV_{CEO}$					$-I_C$=2mA(Pulsed)
BC556		65			V	I_B=0
BC557		45			V	
BC558		30			V	
BC559		30			V	
BC560		45			V	

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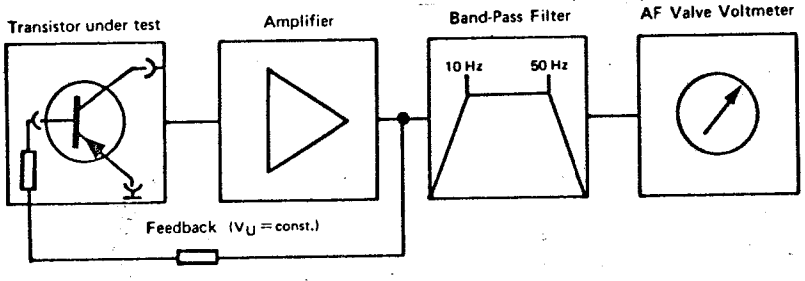
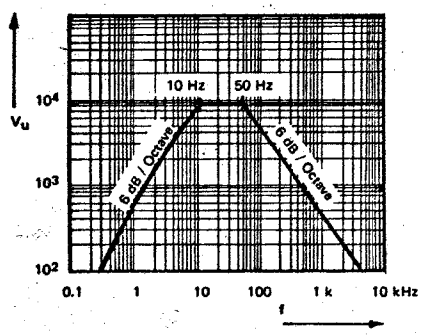
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Emitter-Base Breakdown Voltage	$-BV_{EBO}$	5			V	$-I_E$=1μA I_C=0
Collector Cutoff Current	$-I_{CBO}$			15	nA	$-V_{CB}$=30V I_E=0
				5	μA	$-V_{CB}$=30V I_E=0 T_A=150°C
Collector-Emitter Saturation Voltage	$-V_{CE(sat)}$		0.1	0.3	V	$-I_C$=10mA $-I_B$=0.5mA
			0.25	0.65	V	$-I_C$=100mA $-I_B$=5mA(Pulsed)
Collector-Emitter Knee Voltage	$-V_{CEK}$		0.3	0.6	V	$-I_C$=10mA, I_B=value at which $-I_C$=11mA $-V_{CE}$=1V
Base-Emitter Saturation Voltage	$-V_{BE(sat)}$		0.72		V	$-I_C$=10mA $-I_B$=0.5mA
			0.92		V	$-I_C$=100mA $-I_B$=5mA(Pulsed)
Base-Emitter Voltage	$-V_{BE}$	0.6	0.65	0.75	V	$-I_C$=2mA $-V_{CE}$=5V
			0.7	0.82	V	$-I_C$=10mA $-V_{CE}$=5V
Current Gain-Bandwidth Product	f_T		180		MHz	$-I_C$=10mA $-V_{CE}$=5V
Collector-Base Capacitance	Cob		3.2		pF	$-V_{CB}$=10V I_E=0 f=1MHz
Noise Figure BC556,557,558	NF		2	10	dB	$-I_C$=0.2mA $-V_{CE}$=5V R_G=2KΩ f=1kHz
BC559,560			1.2	4	dB	Δf=200Hz
Noise Figure BC559 only	NF		1.2	4	dB	$-I_C$=0.2mA $-V_{CE}$=5V R_G=2KΩ f=30Hz-15KHz
BC560 only			1.2	2	dB	
Flicker Noise Voltage Referred to Base BC559,560 only	$\overline{En}$			0.11	μV	$-I_C$=0.2mA $-V_{CE}$=5V R_G=2KΩ f=10-50Hz

FLICKER NOISE MEASUREMENT





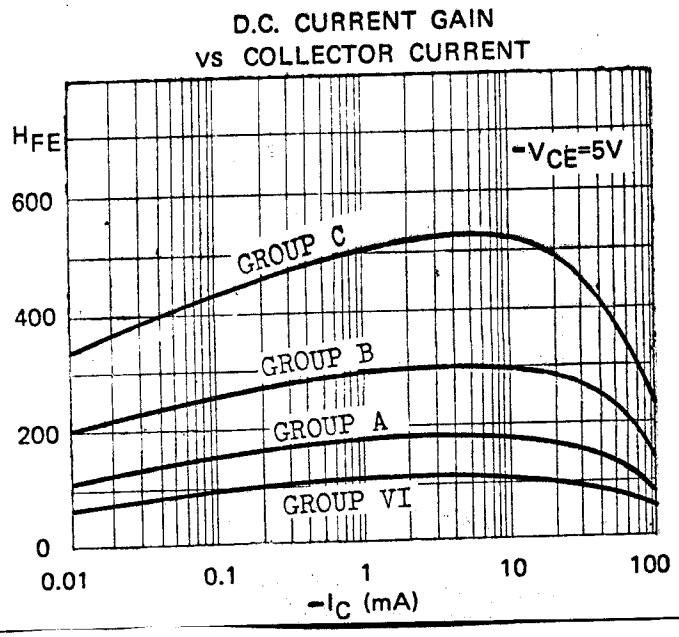
D.C. CURRENT GAIN (H_{FE}) AT $-V_{CE}$=5V T_A=25°C

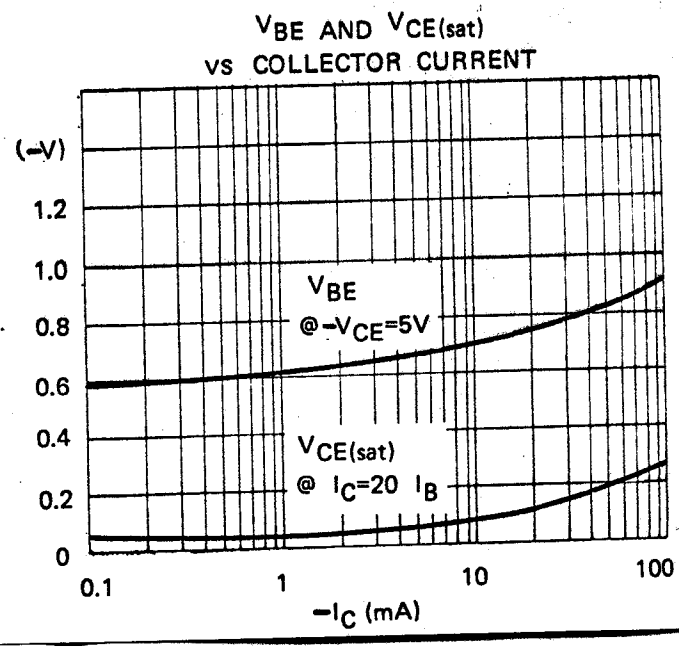
@ $-I_C$	BC556, BC557 BC558			BC556, BC557 BC558 BC559, BC560			BC556, BC557 BC558 BC559, BC560			BC558 BC559, BC560		
	H_{FE} GROUP VI			H_{FE} GROUP A			H_{FE} GROUP B			H_{FE} GROUP C		
	MIN	TYP	MIN	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
0.01mA		70			110			200			330	
2mA	70	110	140	110	170	220	200	300	450	420	520	800
100mA		60			80			140			240	

h - PARAMETERS AT $-I_C$=2mA $-V_{CE}$=5V f=1KHz T_A=25°C

h - PARAMETER	SYMBOL	H_{FE} GROUP VI			H_{FE} GROUP A			H_{FE} GROUP B			H_{FE} GROUP C			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Input Impedance	h_{ie}		1.4			2.7			4.5			8.7		KΩ
Voltage Feedback Ratio	h_{re}		2.5			3			3.5			4		$\times 10^{-4}$
Small Signal Current Gain	h_{fe}	75	110	150	125	190	260	240	330	500	450	580	900	
Output Admittance	h_{oe}		20			25			35			60		μʊ

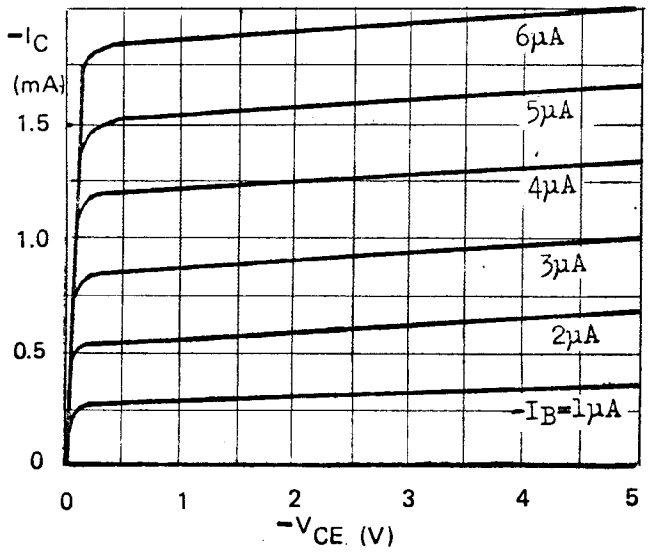
TYPICAL CHARACTERISTICS AT T_A=25°C (Pulse Test)



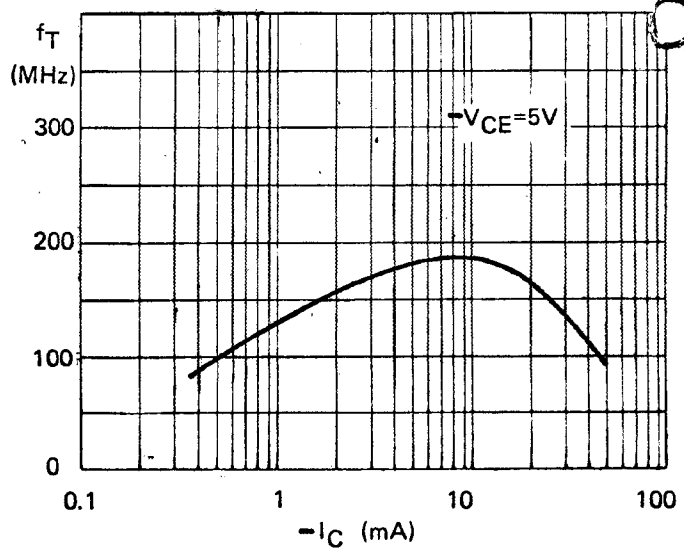


TYPICAL CHARACTERISTICS (T_A=25°C UNLESS OTHERWISE SPECIFIED)

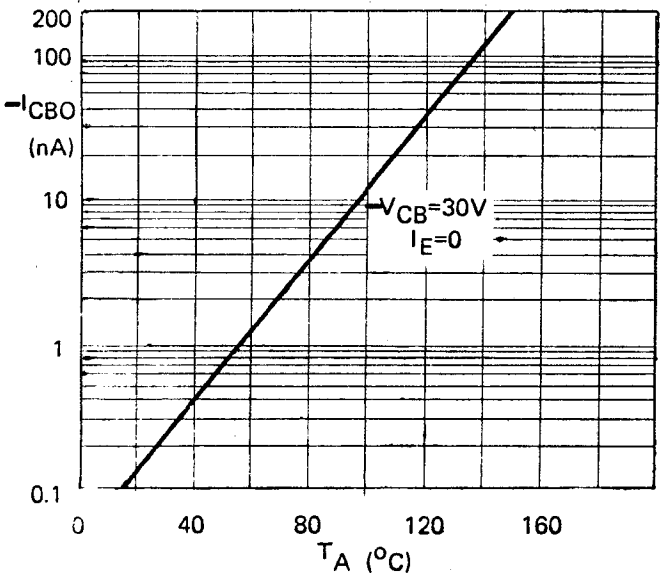
COMMON EMITTER
OUTPUT CHARACTERISTICS



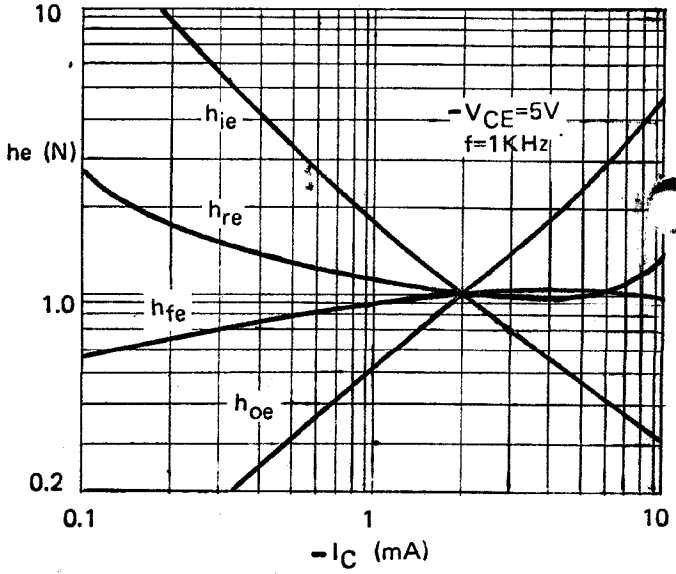
CURRENT GAIN – BANDWIDTH PRODUCT
VS COLLECTOR CURRENT



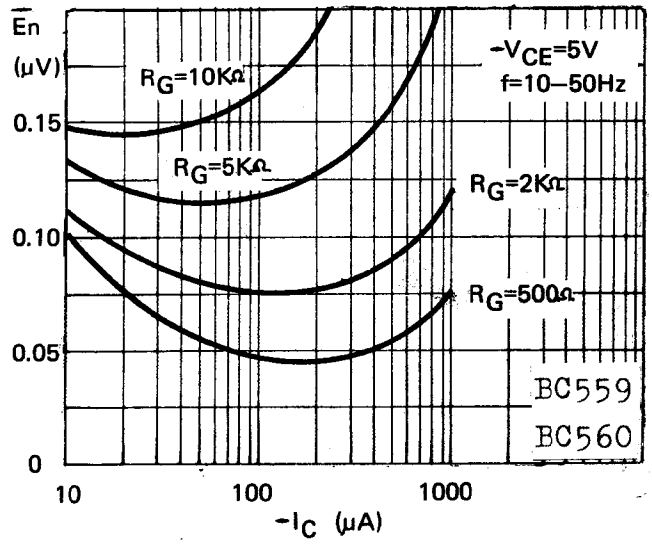
COLLECTOR CUTOFF CURRENT
VS AMBIENT TEMPERATURE



h–PARAMETERS (NORMALIZED)
VS COLLECTOR CURRENT



EQUIVALENT NOISE VOLTAGE AT BASE
VS COLLECTOR CURRENT



BROAD BAND NOISE FIGURE
VS COLLECTOR CURRENT