

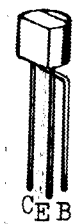
# BC 556 through BC 560

PNP SILICON AF SMALL SIGNAL TRANSISTORS

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 <sub>CB0</sub>	80V	50V	30V	30V	50V
Collector-Emitter Voltage (V <sub>BE</sub> =0)	-V <sub>CES</sub>	80V	50V	30V	30V	50V
Collector-Emitter Voltage (I <sub>B</sub> =0)	-V <sub>CEO</sub>	65V	45V	30V	30V	45V
Emitter-Base Voltage	-V <sub>EB0</sub>			5V		
Collector Current	-I <sub>C</sub>			100mA		
Collector Peak Current	-I <sub>CM</sub>			200mA		
Total Power Dissipation (T <sub>A</sub> ≤ 25°C)	P <sub>tot</sub>			500mW		

derate 4mW/°C above 25°C

Operating Junction & Storage Temperature T<sub>j</sub>, T<sub>stg</sub> -55 to 150°C

ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

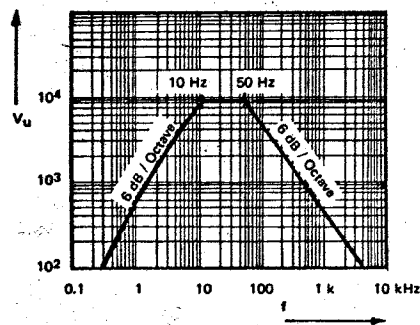
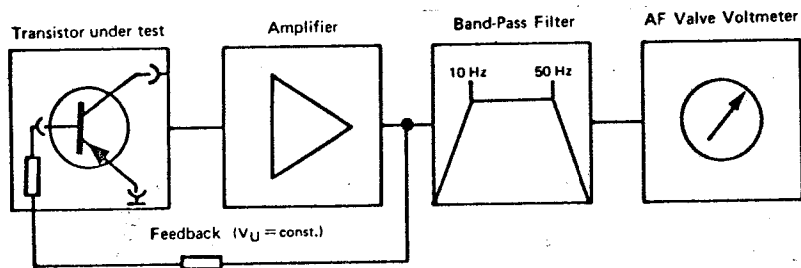
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	-BV <sub>CB0</sub>					-I <sub>C</sub> =10μA I <sub>E</sub> =0
BC556		80			V	
BC557		50			V	
BC558		30			V	
BC559		30			V	
BC560		50			V	
Collector-Emitter Breakdown Voltage	-BV <sub>CES</sub>					-I <sub>C</sub> =10μA V <sub>BE</sub> =0
BC556		80			V	
BC557		50			V	
BC558		30			V	
BC559		30			V	
BC560		50			V	
Collector-Emitter Breakdown Voltage	-LV <sub>CEO</sub>					-I <sub>C</sub> =2mA(Pulsed) I <sub>B</sub> =0
BC556		65			V	
BC557		45			V	
BC558		30			V	
BC559		30			V	
BC560		45			V	

**MICRO ELECTRONICS LTD.**

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 KWUN TONG P. O. BOX 69477 CABLE ADDRESS "MICROTRON"  
 TELEPHONE:- 3-430181-6 3-893363, 3-892423  
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PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Emitter-Base Breakdown Voltage	-V <sub>BEBO</sub>	5			V	-I <sub>E</sub> =1μA I <sub>C</sub> =0
Collector Cutoff Current	-I <sub>CB0</sub>			15	nA	-V <sub>CB</sub> =30V I <sub>E</sub> =0
				5	μA	-V <sub>CB</sub> =30V I <sub>E</sub> =0 T <sub>A</sub> =150°C
Collector-Emitter Saturation Voltage	-V <sub>CE(sat)</sub>	0.1	0.3		V	-I <sub>C</sub> =10mA -I <sub>B</sub> =0.5mA
		0.25	0.65		V	-I <sub>C</sub> =100mA -I <sub>B</sub> =5mA(Pulsed)
Collector-Emitter Knee Voltage	-V <sub>CEK</sub>	0.3	0.6		V	-I <sub>C</sub> =10mA, I <sub>B</sub> =value at which -I <sub>C</sub> =11mA -V <sub>CE</sub> =1V
Base-Emitter Saturation Voltage	-V <sub>BE(sat)</sub>	0.72			V	-I <sub>C</sub> =10mA -I <sub>B</sub> =0.5mA
		0.92			V	-I <sub>C</sub> =100mA -I <sub>B</sub> =5mA(Pulsed)
Base-Emitter Voltage	-V <sub>BE</sub>	0.6	0.65	0.75	V	-I <sub>C</sub> =2mA -V <sub>CE</sub> =5V
		0.7	0.82		V	-I <sub>C</sub> =10mA -V <sub>CE</sub> =5V
Current Gain-Bandwidth Product	f <sub>T</sub>		180		MHz	-I <sub>C</sub> =10mA -V <sub>CE</sub> =5V
Collector-Base Capacitance	C <sub>ob</sub>		3.2		pF	-V <sub>CB</sub> =10V I <sub>E</sub> =0 f=1MHz
Noise Figure BC556, 557, 558 BC559, 560	NF		2	10	dB	-I <sub>C</sub> =0.2mA -V <sub>CE</sub> =5V R <sub>G</sub> =2KΩ f=1kHz
			1.2	4	dB	Δf=200Hz
Noise Figure BC559 only BC560 only	NF		1.2	4	dB	-I <sub>C</sub> =0.2mA -V <sub>CE</sub> =5V R <sub>G</sub> =2KΩ f=30Hz-15KHz
			1.2	2	dB	
Flicker Noise Voltage Referred to Base BC559, 560 only	$\overline{E}_n$			0.11	μV	-I <sub>C</sub> =0.2mA -V <sub>CE</sub> =5V R <sub>G</sub> =2KΩ f=10-50Hz

FLICKER NOISE MEASUREMENT



D.C. CURRENT GAIN (HFE) AT  $-V_{CE}=5V$   $T_A=25^\circ C$

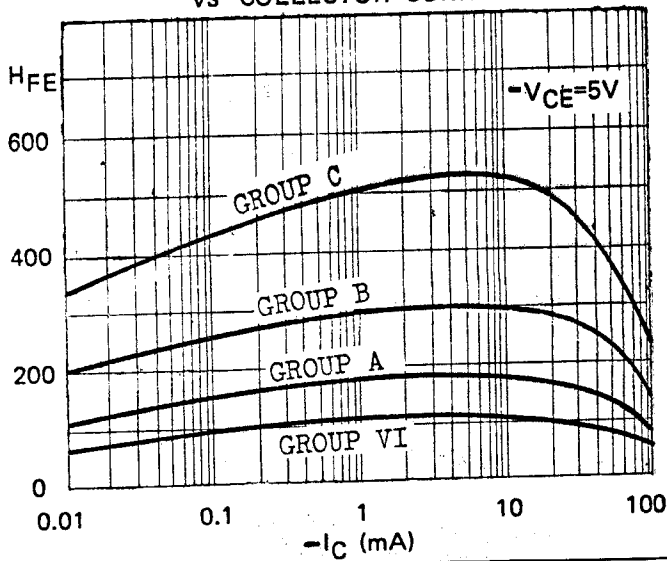
@ $-I_C$	BC556, BC557 BC558	BC556, BC557 BC558 BC559, BC560	BC556, BC557 BC558 BC559, BC560	BC558 BC559, BC560								
	HFE GROUP VI			HFE GROUP A			HFE GROUP B			HFE GROUP C		
	MIN	TYP	MIN	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
0.01mA	70			110			200			330		
2mA	70	110	140	110	170	220	200	300	450	420	520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

h - PARAMETERS AT  $-I_C=2mA$   $-V_{CE}=5V$   $f=1kHz$   $T_A=25^\circ C$

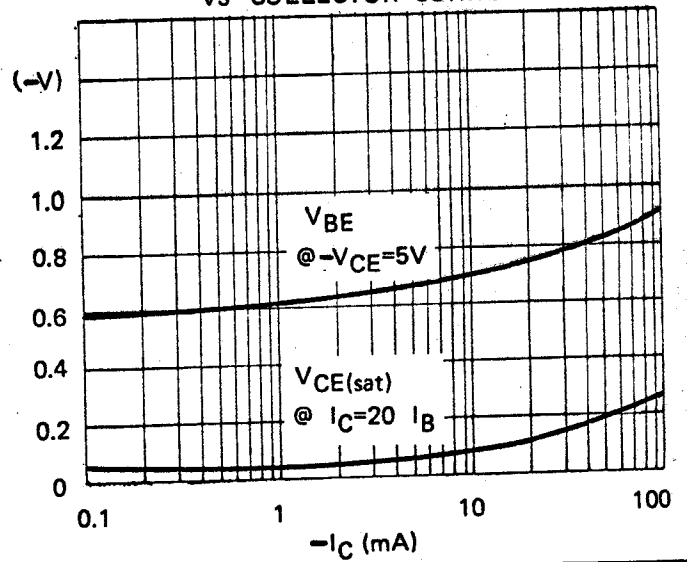
h - PARAMETER	SYMBOL	HFE GROUP VI			HFE GROUP A			HFE GROUP B			HFE GROUP C			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Input Impedance	$h_{ie}$	1.4			2.7			4.5			8.7			$k\Omega$
Voltage Feedback Ratio	$h_{re}$	2.5			3			3.5			4			$\times 10^{-4}$
Small Signal Current Gain	$h_{fe}$	75	110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

TYPICAL CHARACTERISTICS AT  $T_A=25^\circ C$  (Pulse Test)

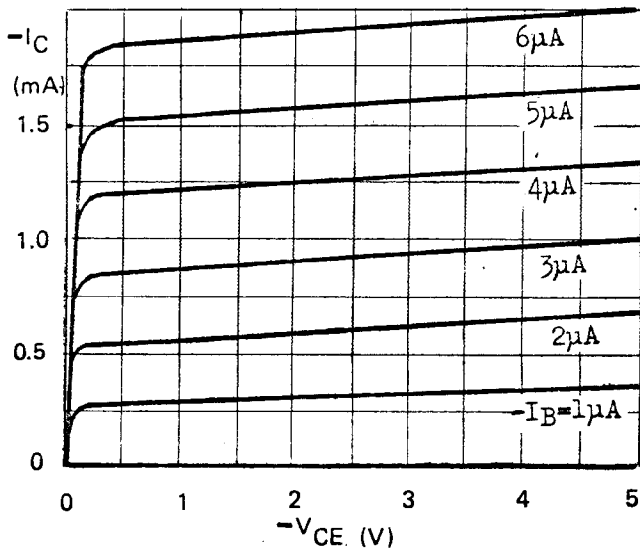
D.C. CURRENT GAIN  
vs COLLECTOR CURRENT



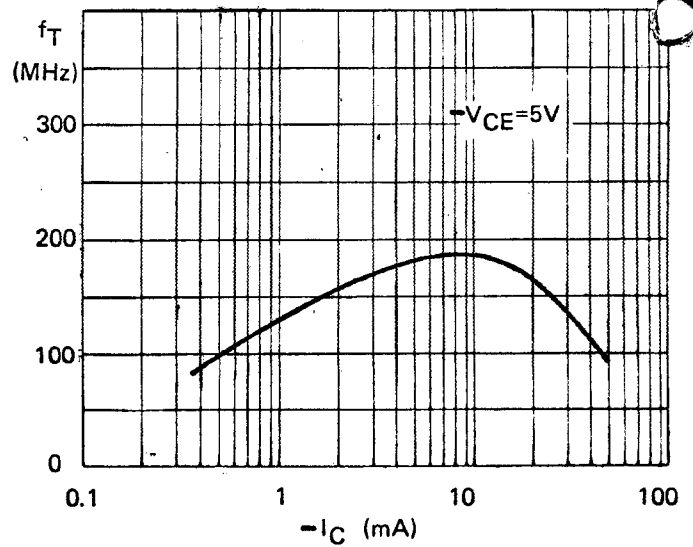
$V_{BE}$  AND  $V_{CE(sat)}$   
vs COLLECTOR CURRENT



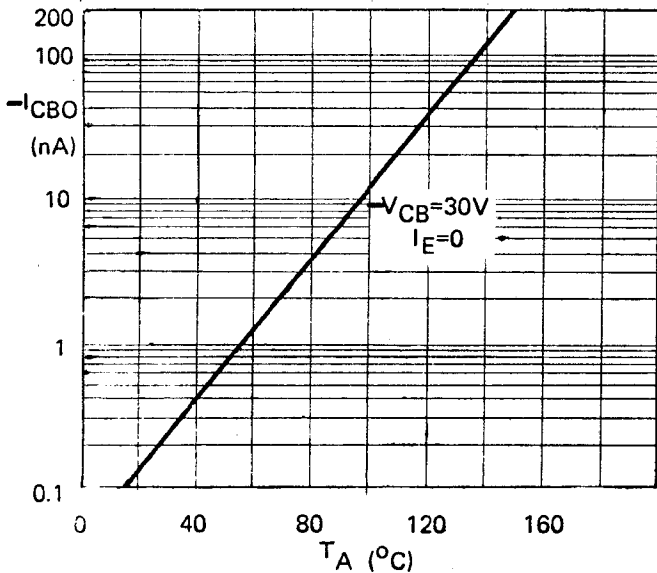
COMMON EMITTER  
OUTPUT CHARACTERISTICS



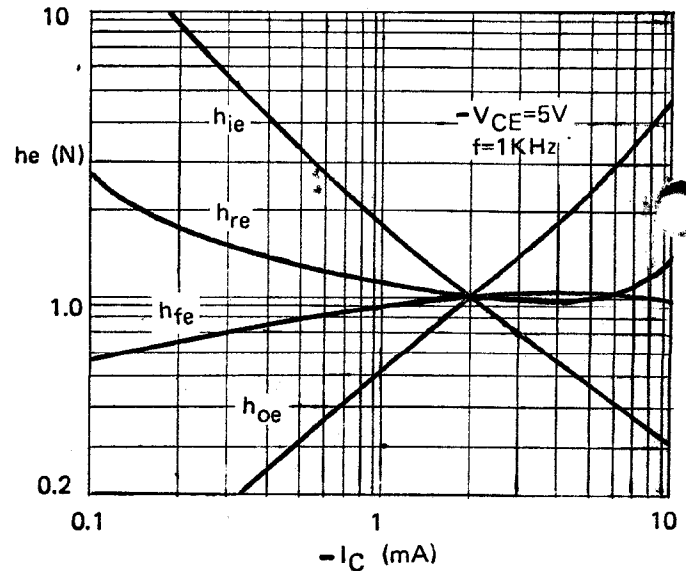
CURRENT GAIN - BANDWIDTH PRODUCT  
VS COLLECTOR CURRENT



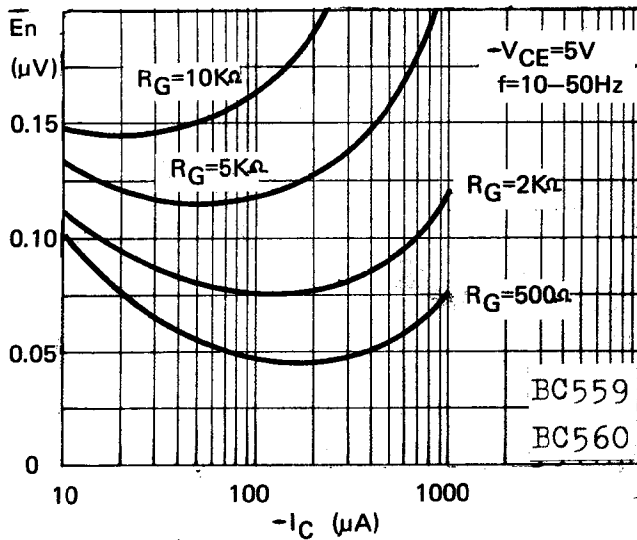
COLLECTOR CUTOFF CURRENT  
VS AMBIENT TEMPERATURE



h-PARAMETERS (NORMALIZED)  
VS COLLECTOR CURRENT



EQUIVALENT NOISE VOLTAGE AT BASE  
VS COLLECTOR CURRENT



BROAD BAND NOISE FIGURE  
VS COLLECTOR CURRENT

