

# BC 546 through BC 550

NPN SILICON AF SMALL SIGNAL TRANSISTORS

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

THE BC549, BC550 ARE CHARACTERIZED BY LOW NOISE FIGURE.

CASE TO-92F



CEB

## ABSOLUTE MAXIMUM RATINGS

		BC546	BC547	BC548	BC549	BC550
Collector-Base Voltage	V <sub>CBO</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>EBO</sub>	6V	6V	5V	5V	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)

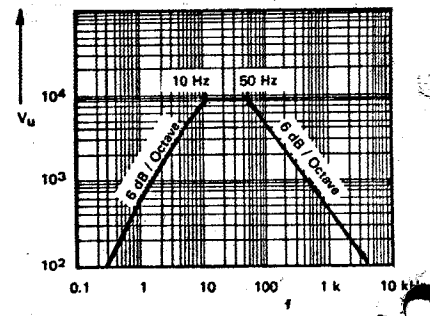
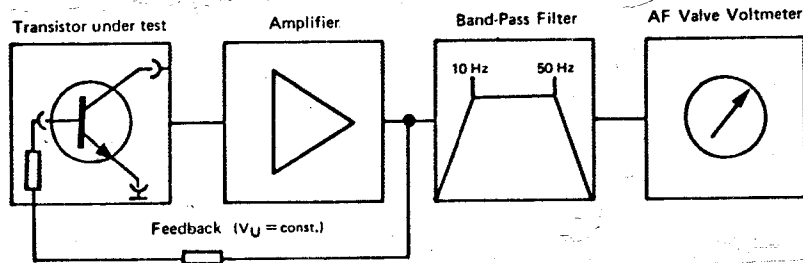
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>					I <sub>C</sub> =10μA I <sub>E</sub> =0
BC546		80			V	
BC547		50			V	
BC548		30			V	
BC549		30			V	
BC550		50			V	
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>					I <sub>C</sub> =10μA V <sub>BE</sub> =0
BC546		80			V	
BC547		50			V	
BC548		30			V	
BC549		30			V	
BC550		50			V	
Collector-Emitter Breakdown Voltage	LV <sub>CEO</sub>					I <sub>C</sub> =2mA (Pulsed) I <sub>B</sub> =0
BC546		65			V	
BC547		45			V	
BC548		30			V	
BC549		30			V	
BC550		45			V	

**MICRO ELECTRONICS LTD.**

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PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Emitter-Base Breakdown Voltage BC546, 547 BC548, 549, 550	BVEBO	6			V	I <sub>E</sub> =1μA I <sub>C</sub> =0
		5			V	
Collector Cutoff Current	I <sub>CBO</sub>			15	nA	V <sub>CB</sub> =30V I <sub>E</sub> =0 V <sub>CB</sub> =30V I <sub>E</sub> =0 T <sub>A</sub> =150°C
				5	μA	
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	0.07	0.25		V	I <sub>C</sub> =10mA I <sub>B</sub> =0.5mA I <sub>C</sub> =100mA I <sub>B</sub> =5mA(Pulsed)
		0.22	0.6		V	
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>	0.7			V	I <sub>C</sub> =10mA I <sub>B</sub> =0.5mA I <sub>C</sub> =100mA I <sub>B</sub> =5mA(Pulsed)
		0.9			V	
Base-Emitter Voltage	V <sub>BE</sub>	0.58	0.63	0.7	V	I <sub>C</sub> =2mA V <sub>CE</sub> =5V I <sub>C</sub> =10mA V <sub>CE</sub> =5V
		0.68	0.77		V	
Current Gain-Bandwidth Product	f <sub>T</sub>		250		MHz	I <sub>C</sub> =10mA V <sub>CE</sub> =5V
Collector-Base Capacitance	C <sub>ob</sub>		2.7	4.5	pF	V <sub>CB</sub> =10V I <sub>E</sub> =0 f=1MHz
Noise Figure BC546, 547, 548 BC549, 550	NF		2	10	dB	I <sub>C</sub> =0.2mA V <sub>CE</sub> =5V R <sub>G</sub> =2KΩ f=1kHz Δf=200Hz
			1.4	4	dB	
Noise Figure BC549 only BC550 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	3	dB	
Flicker Noise Voltage Referred to Base BC549, 550 only	$\overline{E_n}$		0.135		μV	I <sub>C</sub> =0.2mA V <sub>CE</sub> =5V R <sub>G</sub> =2KΩ f=10Hz-50Hz

FLICKER NOISE MEASUREMENT



D.C. CURRENT GAIN (HFE) AT VCE=5V TA=25°C

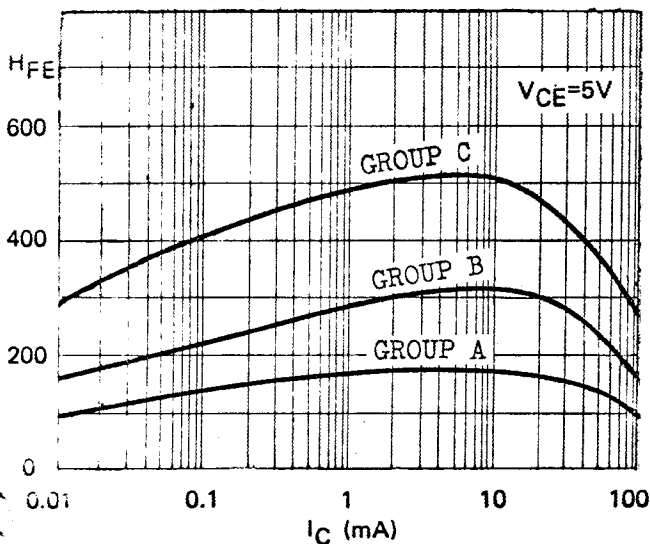
@ IC	BC546, BC547 BC548	BC546, BC547 BC548 BC549, BC550	BC548 BC549, BC550						
	HFE GROUP A			HFE GROUP B			HFE GROUP C		
	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
0.01mA	90			170			290		
2mA	110	170	220	200	300	450	420	520	800
100mA	100			160			270		

h - PARAMETERS AT IC=2mA VCE=5V f=1kHz TA=25°C

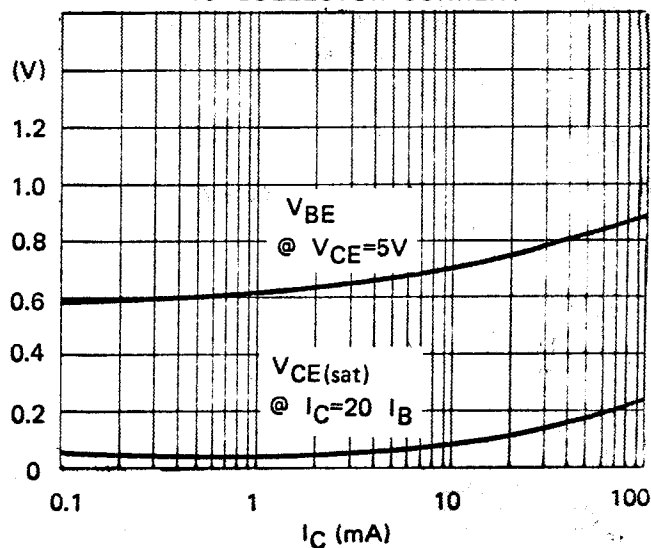
h - PARAMETER	SYMBOL	HFE GROUP A			HFE GROUP B			HFE GROUP C			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Input Impedance	hie	1.6	2.7	4.5	3.2	4.5	8.5	6	8.7	15	kΩ
Voltage Feedback Ratio	hre	1.5			2			3			x10 <sup>-4</sup>
Small Signal Current Gain	hfe	125	190	260	240	330	500	450	580	900	
Output Admittance	hoe	18 30			30 60			60 110			μU

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

D.C. CURRENT GAIN vs COLLECTOR CURRENT



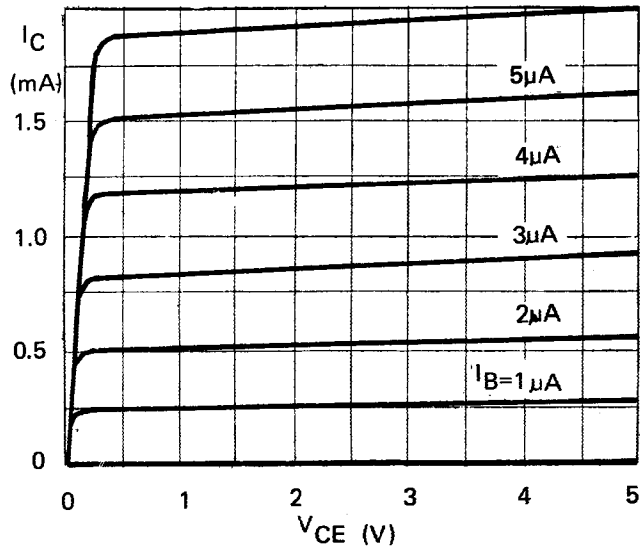
VBE and VCE(sat) vs COLLECTOR CURRENT



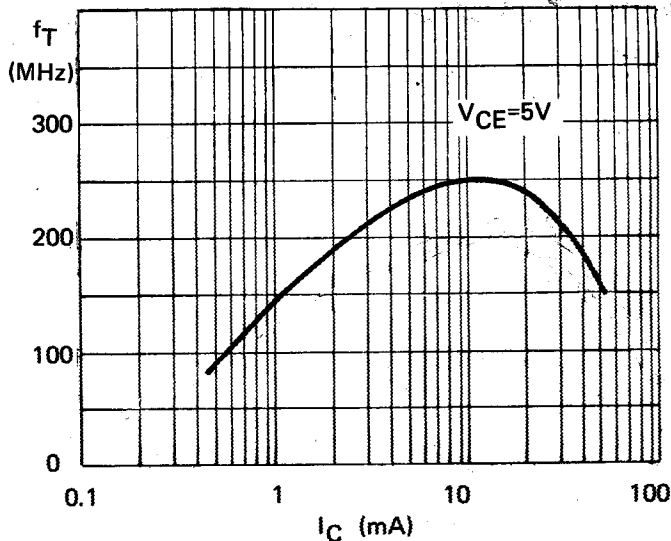
TYPICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$  UNLESS OTHERWISE SPECIFIED)

BC546 family

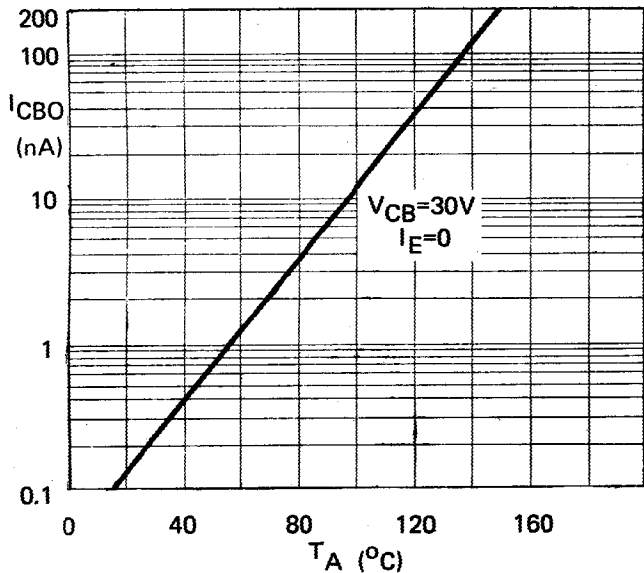
COMMON EMITTER  
OUTPUT CHARACTERISTICS



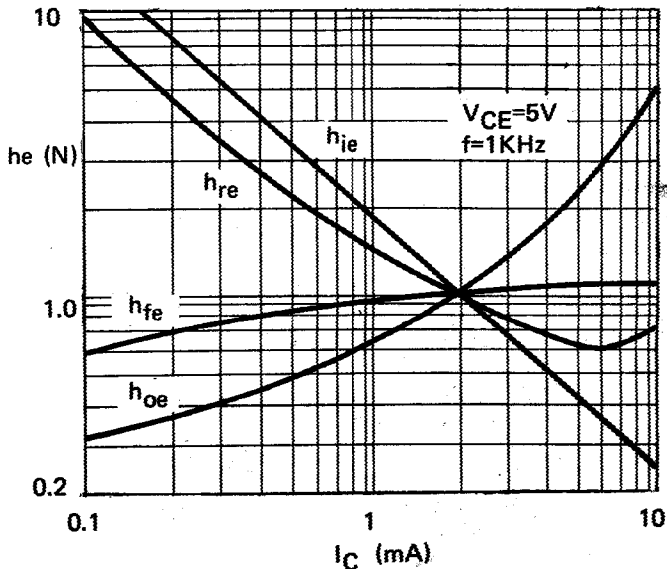
CURRENT GAIN - BANDWIDTH PRODUCT  
VS COLLECTOR CURRENT



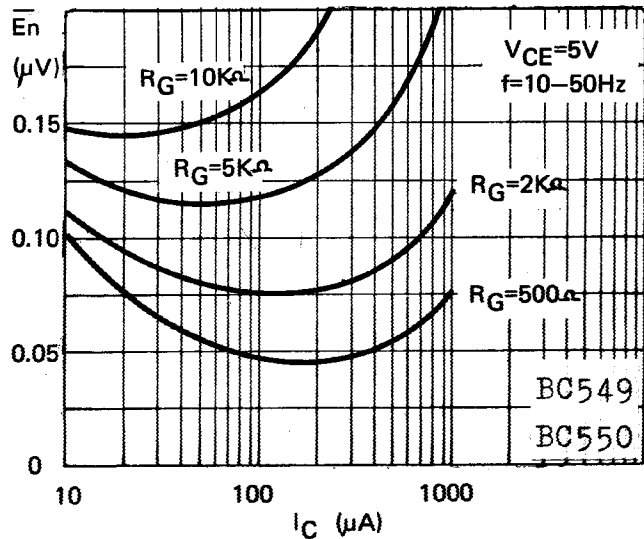
COLLECTOR CUTOFF CURRENT  
VS AMBIENT TEMPERATURE



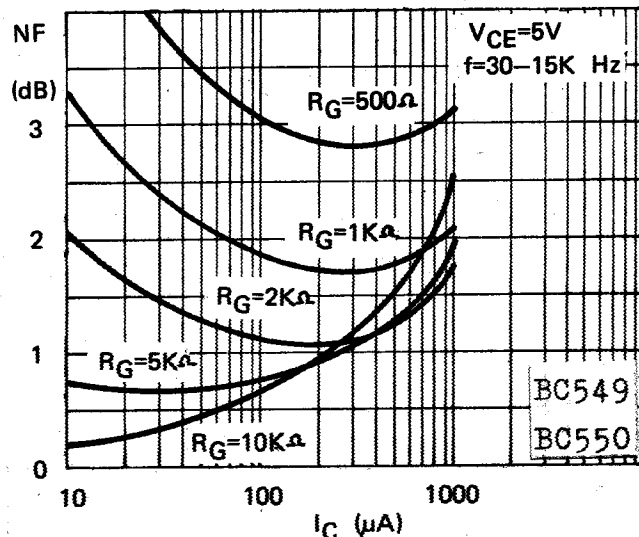
h-PARAMETERS (NORMALIZED)  
VS COLLECTOR CURRENT



EQUIVALENT NOISE VOLTAGE AT BASE  
VS COLLECTOR CURRENT



BROAD BAND NOISE FIGURE  
VS COLLECTOR CURRENT



BC546 family