

# 2N 5209 · 2N 5210

NPN SILICON AF LOW NOISE SMALL SIGNAL TRANSISTORS

THE 2N5209, 2N5210 ARE NPN SILICON PLANAR EPITAXIAL TRANSISTORS FOR USE IN AF LOW NOISE PREAMPLIFIERS. THEY ARE COMPLEMENTARY TO THE PNP TYPE 2N5086, 2N5087.

CASE TO-92A

ABSOLUTE MAXIMUM RATINGS

Collector-Base Voltage	VCBO	50V
Collector-Emitter Voltage	VCEO	50V
Emitter-Base Voltage	VEBO	4.5V
Collector Current	IC	50mA
Total Power Dissipation ( $T_A \leq 25^\circ\text{C}$ )	Ptot	350mW
		derate 2.8mW/°C above 25°C
Operating Junction & Storage Temperature	Tj, Tstg	-55 to 150°C

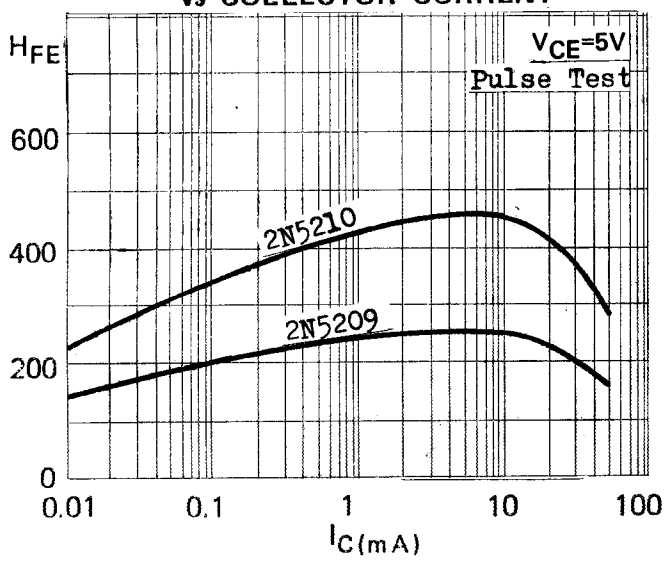
ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$  unless otherwise noted)

PARAMETER	SYMBOL	2N 5209 MIN MAX	2N 5210 MIN MAX	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	50	50	V	I <sub>C</sub> =0.1mA I <sub>E</sub> =0
Collector-Emitter Breakdown Voltage	LV <sub>CE0</sub>	50	50	V	I <sub>C</sub> =1mA (Pulsed) I <sub>B</sub> =0
Collector Cutoff Current	I <sub>CB0</sub>	50	50	nA	V <sub>CB</sub> =35V I <sub>E</sub> =0
Emitter Cutoff Current	I <sub>EB0</sub>	50	50	nA	V <sub>EB</sub> =3V I <sub>C</sub> =0
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	0.7	0.7	V	I <sub>C</sub> =10mA I <sub>B</sub> =1mA
Base-Emitter Voltage	V <sub>BE</sub>	0.85	0.85	V	I <sub>C</sub> =1mA V <sub>CE</sub> =5V
D.C. Current Gain	H <sub>FE</sub>	100 300 150 150	200 600 250 250		I <sub>C</sub> =0.1mA V <sub>CE</sub> =5V I <sub>C</sub> =1mA V <sub>CE</sub> =5V I <sub>C</sub> =10mA V <sub>CE</sub> =5V
Current Gain-Bandwidth Product	f <sub>T</sub>	30	30	MHz	I <sub>C</sub> =0.5mA V <sub>CE</sub> =5V
Collector-Base Capacitance	C <sub>ob</sub>	4	4	pF	V <sub>CB</sub> =5V I <sub>E</sub> =0 f=1MHz
Small Signal Current Gain	h <sub>fe</sub>	150 600	250 900		I <sub>C</sub> =1mA V <sub>CE</sub> =5V f=1KHz
Noise Figure	NF	3	2	dB	I <sub>C</sub> =20μA V <sub>CE</sub> =5V R <sub>G</sub> =22KΩ f=10Hz-15KHz
	NF	4	3	dB	I <sub>C</sub> =20μA V <sub>CE</sub> =5V R <sub>G</sub> =10KΩ f=1KHz

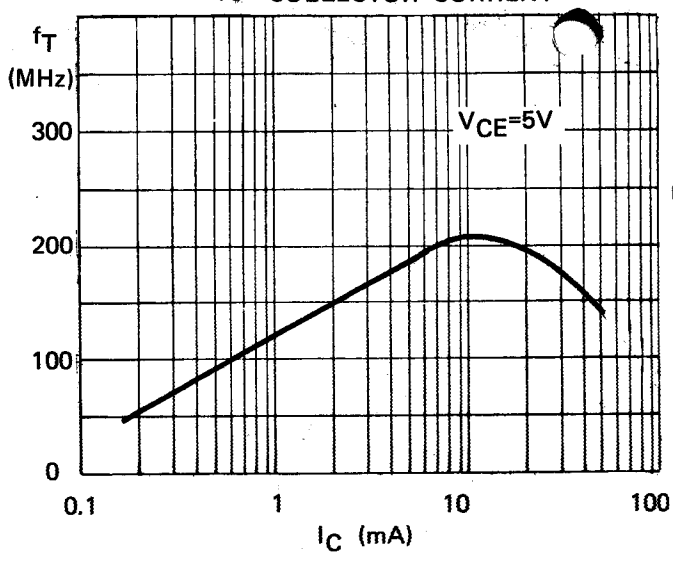


TYPICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$  UNLESS OTHERWISE SPECIFIED)

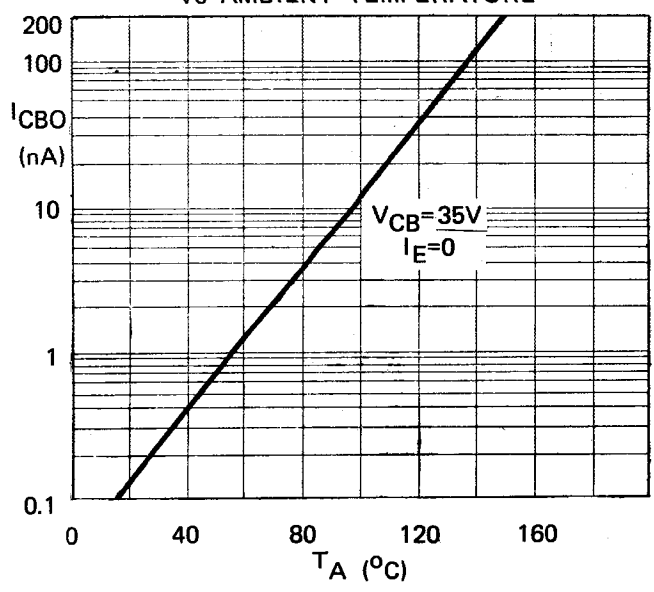
D.C. CURRENT GAIN  
vs COLLECTOR CURRENT



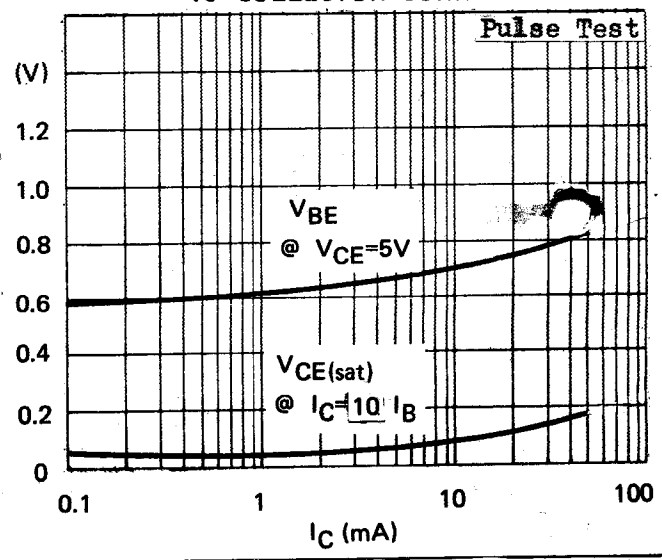
CURRENT GAIN - BANDWIDTH PRODUCT  
vs COLLECTOR CURRENT



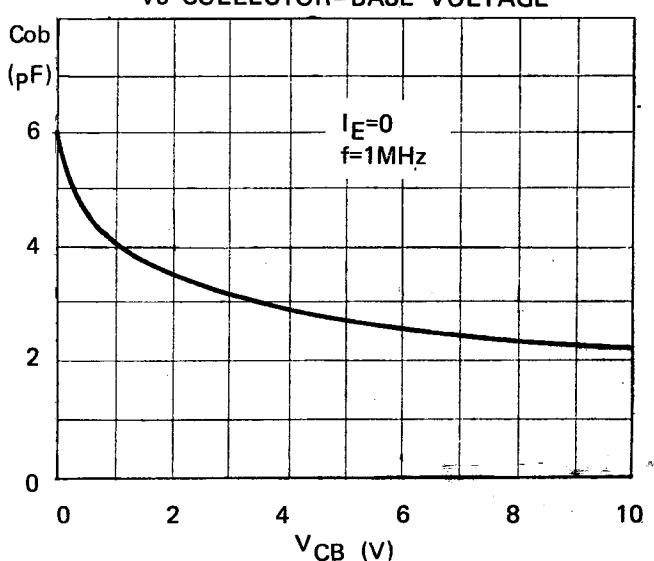
COLLECTOR CUTOFF CURRENT  
vs AMBIENT TEMPERATURE



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



COLLECTOR-BASE CAPACITANCE  
vs COLLECTOR-BASE VOLTAGE



BROAD-BAND NOISE FIGURE  
vs COLLECTOR CURRENT

