

# 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



EBC

## ABSOLUTE MAXIMUM RATINGS

Collector-Base Voltage	V <sub>CB0</sub>	50V
Collector-Emitter Voltage	V <sub>CE0</sub>	50V
Emitter-Base Voltage	V <sub>EB0</sub>	4.5V
Collector Current	I <sub>C</sub>	50mA
Total Power Dissipation (T <sub>A</sub> ≤ 25°C)	P <sub>tot</sub>	350mW derate 2.8mW/°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	2N 5209		2N 5210		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	50		50		V	I <sub>C</sub> =0.1mA I <sub>B</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>CBO</sub>		50		50	nA	V <sub>CB</sub> =35V I <sub>E</sub> =0
Emitter Cutoff Current	I <sub>EBO</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	200	600		I <sub>C</sub> =0.1mA V <sub>CE</sub> =5V
		150		250			I <sub>C</sub> =1mA V <sub>CE</sub> =5V
		150		250			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
			4		3	dB	I <sub>C</sub> =20μA V <sub>CE</sub> =5V R <sub>G</sub> =10KΩ f=1KHz

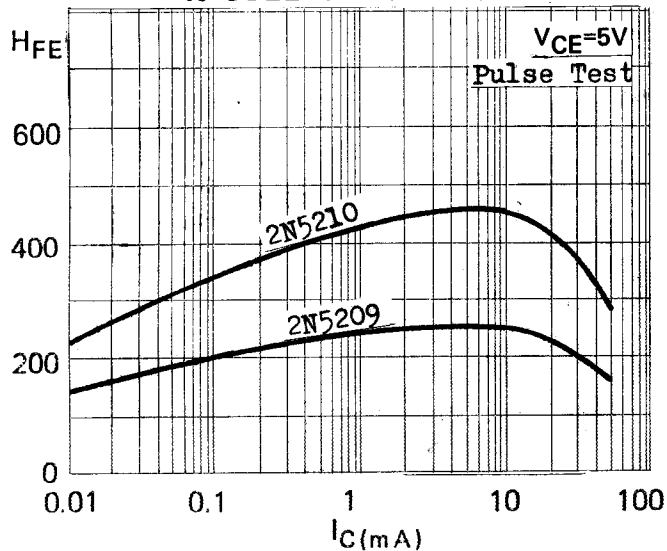
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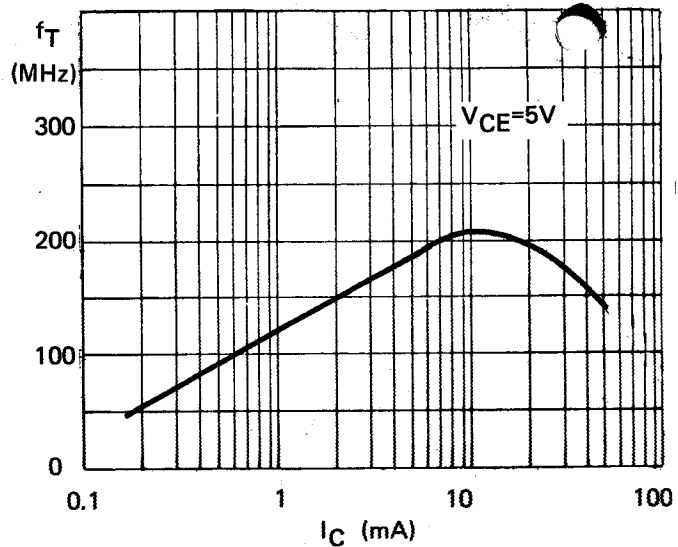
FAX: 3-410321

2N5209, 2N5210

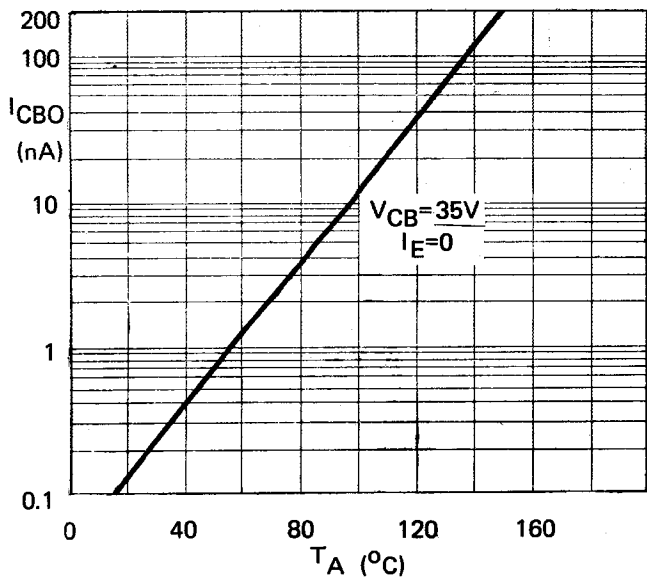
D.C. CURRENT GAIN vs COLLECTOR CURRENT



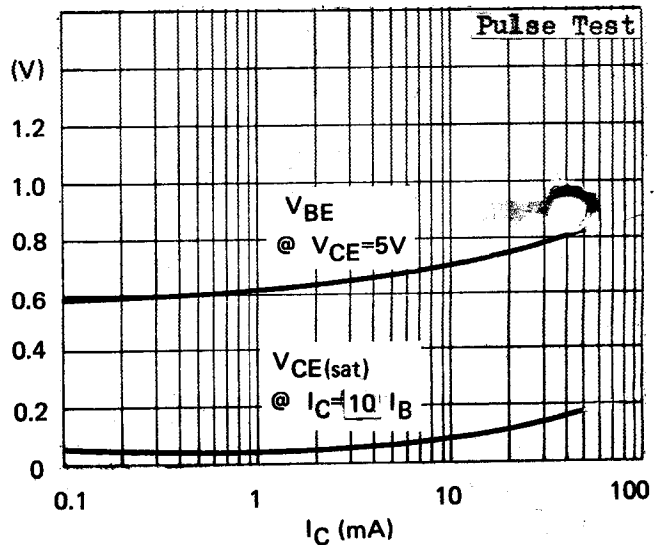
CURRENT GAIN - BANDWIDTH PRODUCT vs COLLECTOR CURRENT



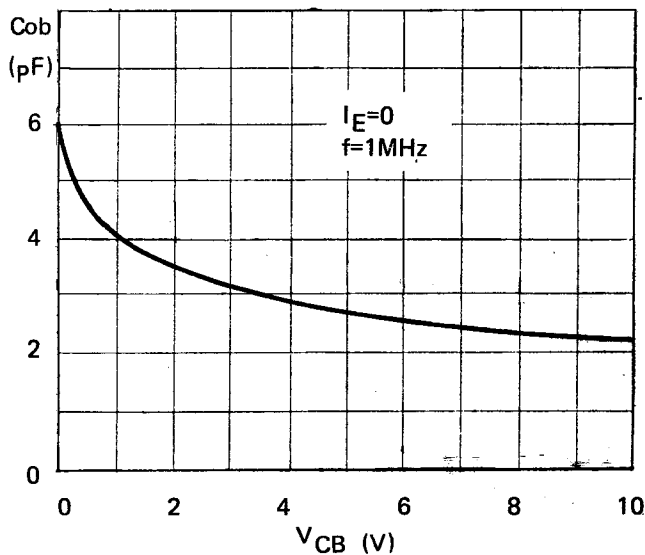
COLLECTOR CUTOFF CURRENT vs AMBIENT TEMPERATURE



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



COLLECTOR-BASE CAPACITANCE vs COLLECTOR-BASE VOLTAGE



BROAD-BAND NOISE FIGURE vs COLLECTOR CURRENT

