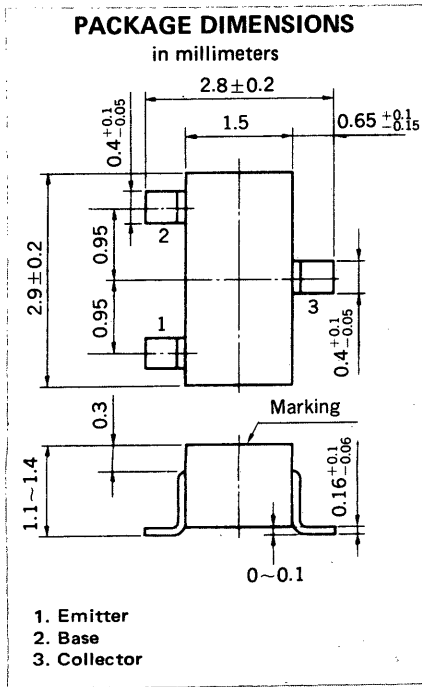


# SILICON TRANSISTOR 2SC1009A

## FM/AM RF AMPLIFIER, MIXER, OSCILLATOR, CONVERTER NPN SILICON EPITAXIAL TRANSISTOR MINI MOLD



### FEATURES

- High Gain Bandwidth Product:  $f_T = 250$  MHz TYP.
- Low Output Capacitance:  $C_{ob} = 1.8$  pF TYP.
- Low Noise Figure: NF = 2.5 dB TYP.

### ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Current ( $T_a = 25^\circ\text{C}$ )

Collector to Base Voltage	$V_{CBO}$	50	V
Collector to Emitter Voltage	$V_{CEO}$	30	V
Emitter to Base Voltage	$V_{EBO}$	5.0	V
Collector Current (DC)	$I_C$	50	mA

Maximum Power Dissipation

Total Power Dissipation at $25^\circ\text{C}$ Ambient Temperature	$P_T$	150	mW
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Maximum Temperatures

Junction Temperature	$T_j$	125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +125	$^\circ\text{C}$

### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

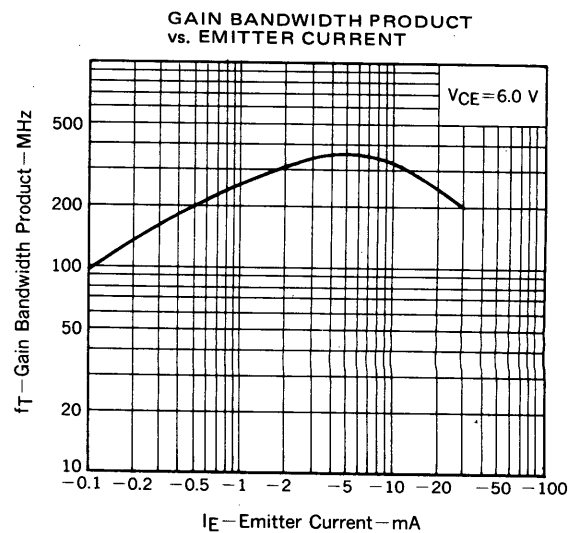
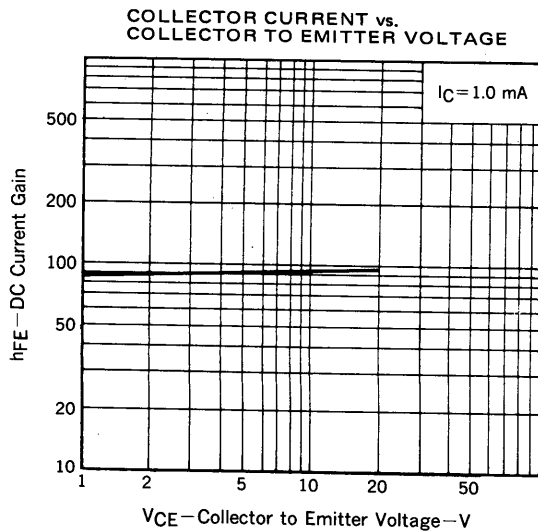
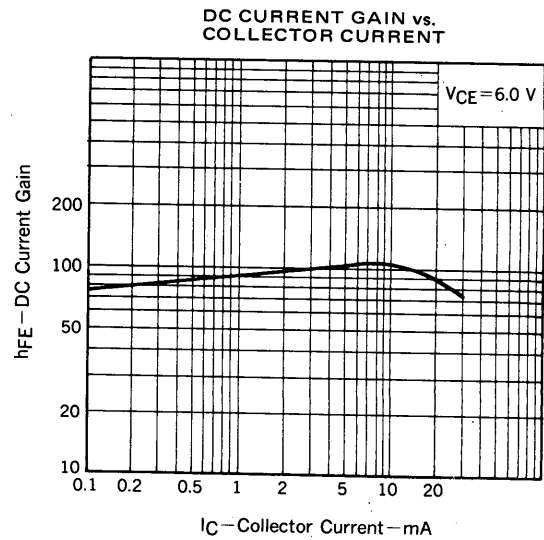
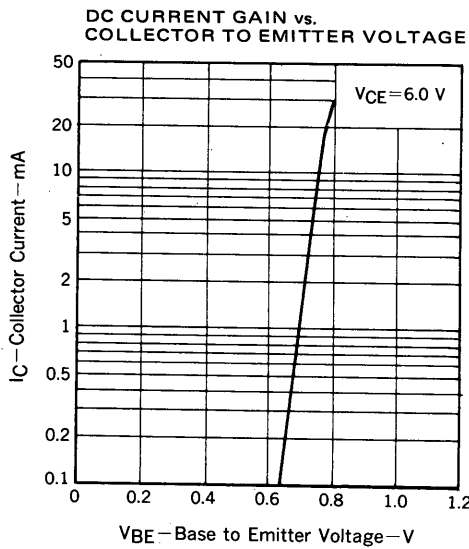
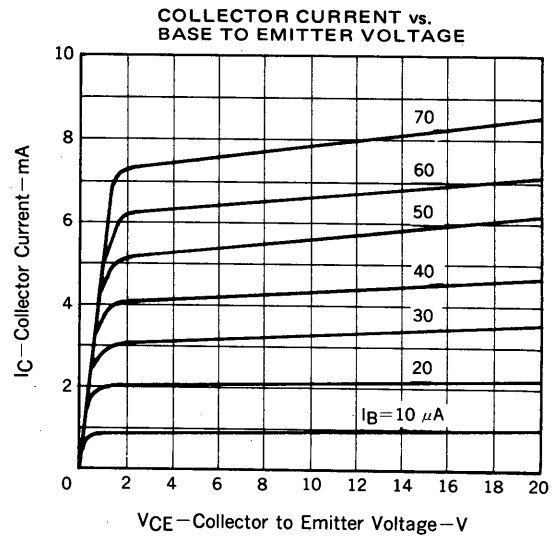
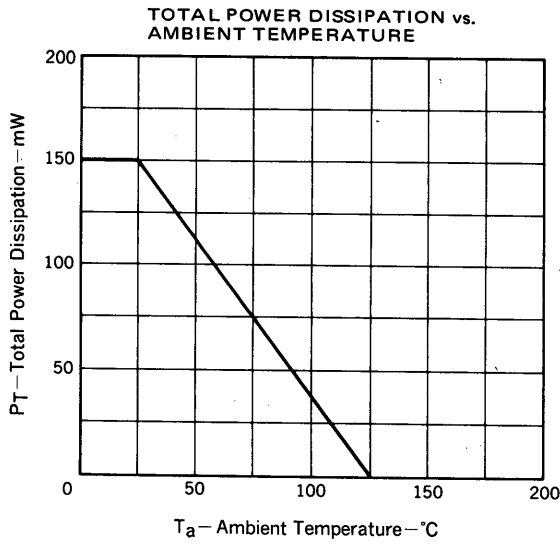
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			0.1	$\mu\text{A}$	$V_{CB} = 50$ V, $I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			0.1	$\mu\text{A}$	$V_{EB} = 5.0$ V, $I_C = 0$
DC Current Gain	$h_{FE}$	60	100	180		$V_{CE} = 6.0$ V, $I_C = 1.0$ mA*
Base to Emitter Voltage	$V_{BE}$	0.65	0.70	0.75	V	$V_{CE} = 6.0$ V, $I_C = 1.0$ mA
Collector Saturation Voltage	$V_{CE(sat)}$		0.08	0.3	V	$I_C = 10$ mA, $I_B = 1.0$ mA
Gain Bandwidth Product	$f_T$	150	250		MHz	$V_{CE} = 6.0$ V, $I_E = -1.0$ mA
Output Capacitance	$C_{ob}$		1.9	2.2	pF	$V_{CB} = 6.0$ V, $I_E = 0$ , $f = 1.0$ MHz
Collector to Base Time Constant	$C_c \cdot r_b' \cdot b$		10	15	ps	$V_{CB} = 6.0$ V, $I_E = -10$ mA, $f = 31.9$ MHz
Noise Figure	NF		2.0	4.0	dB	$V_{CE} = 6.0$ V, $I_E = -1.0$ mA, $f = 1.0$ MHz, $R_G = 500 \Omega$

\* Pulsed:  $PW \leq 350 \mu\text{s}$ , Duty Cycle  $\leq 2\%$

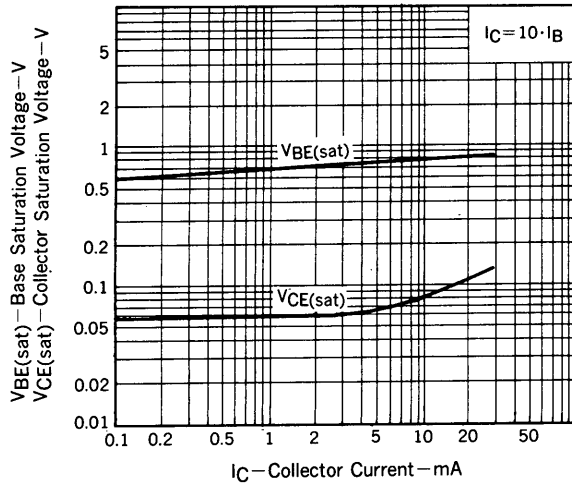
### $h_{FE}$ Classification

Marking	FA3	FA4
$h_{FE}$	60 to 120	90 to 180

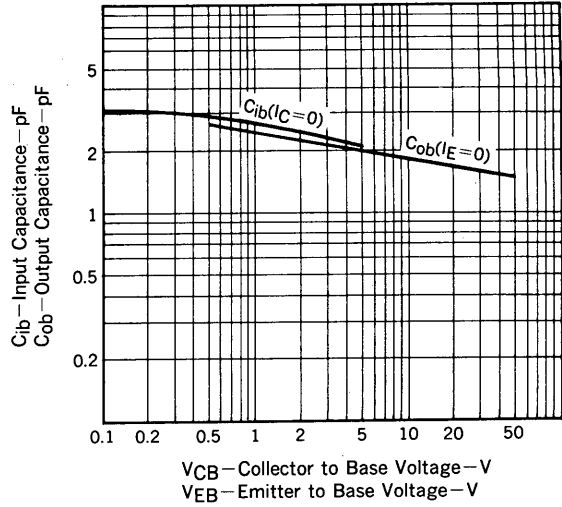
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



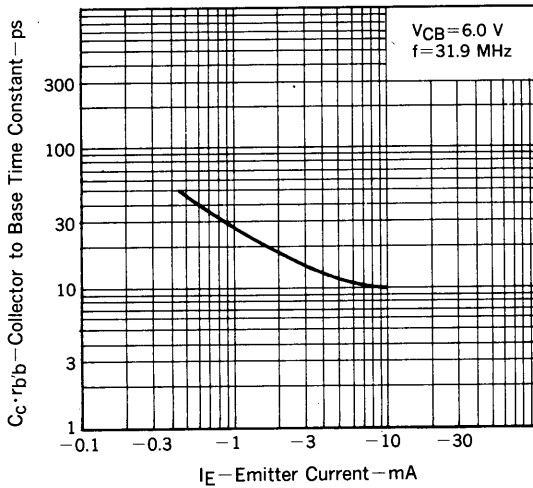
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



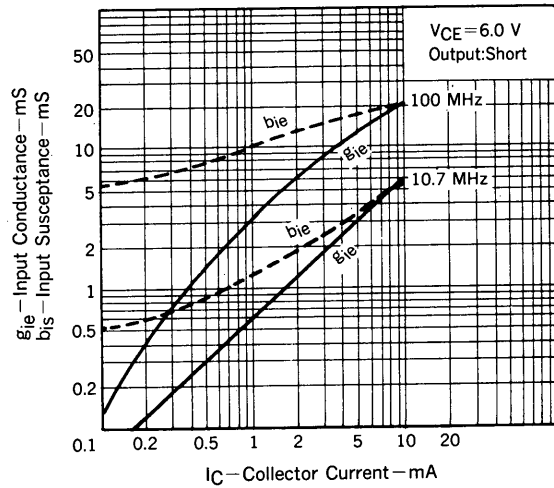
INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



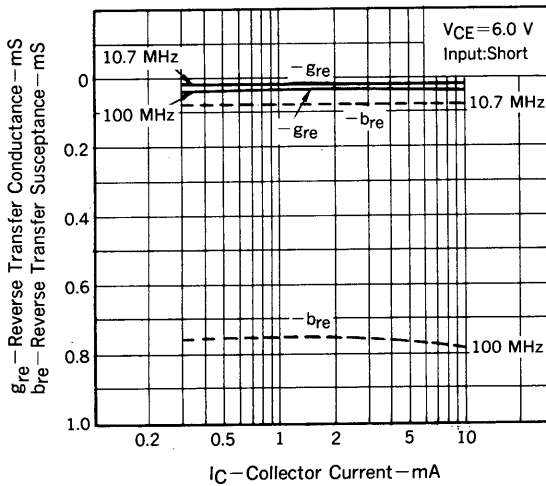
COLLECTOR TO BASE TIME CONSTANT vs. EMITTER CURRENT



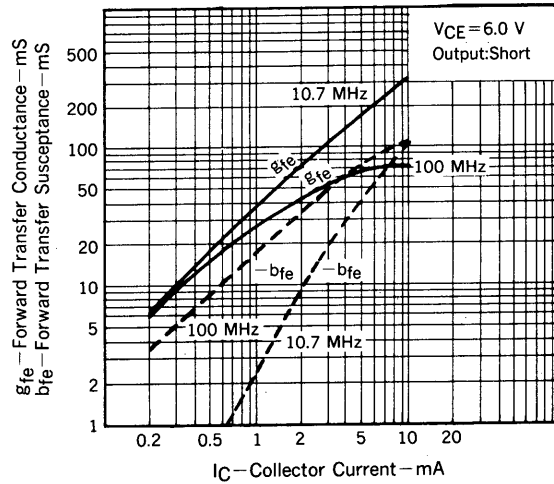
INPUT ADMITTANCE ( $y_{ie}$ ) vs. COLLECTOR CURRENT



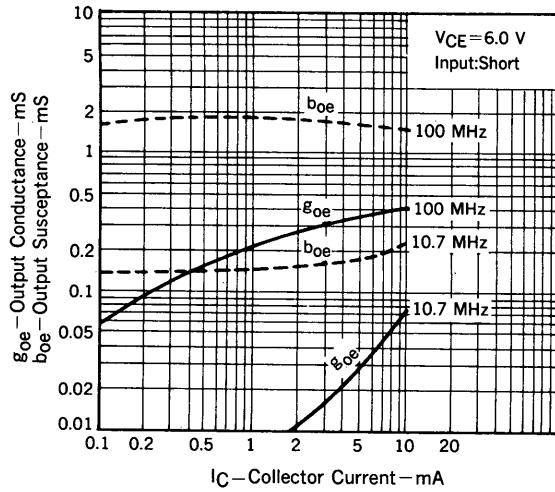
REVERSE TRANSFER ADMITTANCE ( $y_{re}$ ) vs. COLLECTOR CURRENT



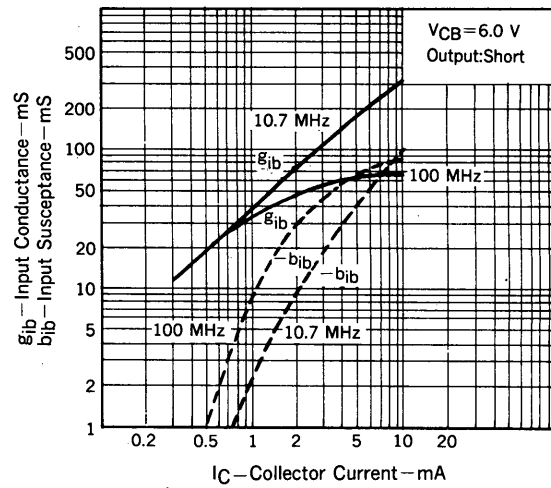
FORWARD TRANSFER ADMITTANCE ( $y_{fe}$ ) vs. COLLECTOR CURRENT



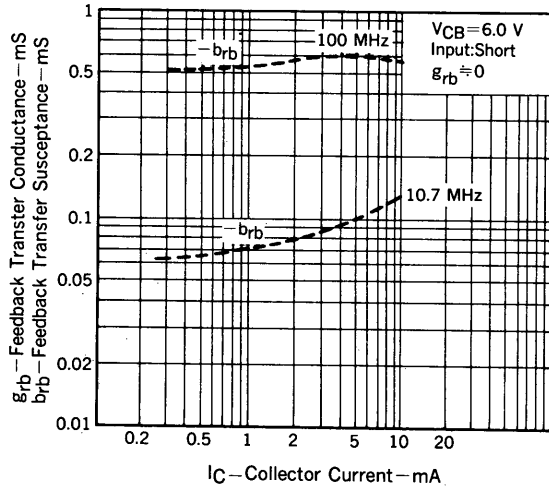
OUTPUT ADMITTANCE ( $y_{oe}$ ) vs. COLLECTOR CURRENT



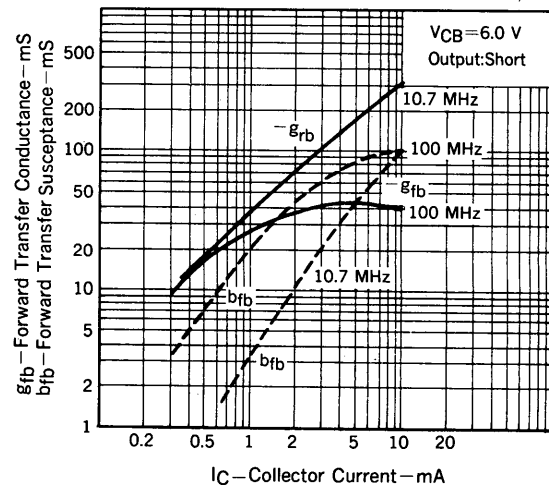
INPUT ADMITTANCE ( $y_{ib}$ ) vs. COLLECTOR CURRENT



REVERSE TRANSFER ADMITTANCE ( $y_{rb}$ ) vs. COLLECTOR CURRENT



FORWARD TRANSFER ADMITTANCE ( $y_{fb}$ ) vs. COLLECTOR CURRENT



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