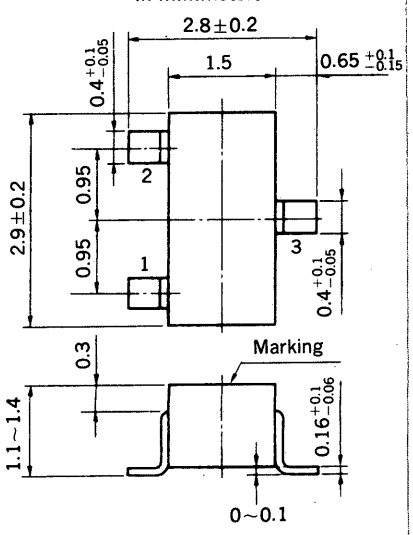
NEC
ELECTRON DEVICE

SILICON TRANSISTOR
2SC1009A

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

PACKAGE DIMENSIONS
in millimeters



1. Emitter
2. Base
3. Collector

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 °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 °C Ambient Temperature	P_T	150	mW
Maximum Temperatures			
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55 to +125	°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			0.1	μA	V_{CB} = 50 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			0.1	μA	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	$C_{c\cdot rb'b}$		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 Ω

* Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

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

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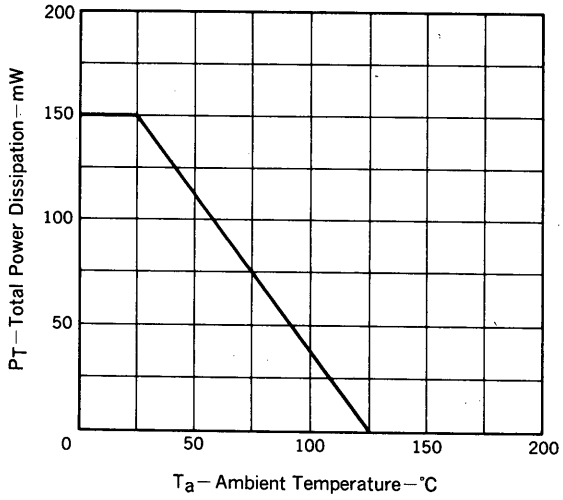
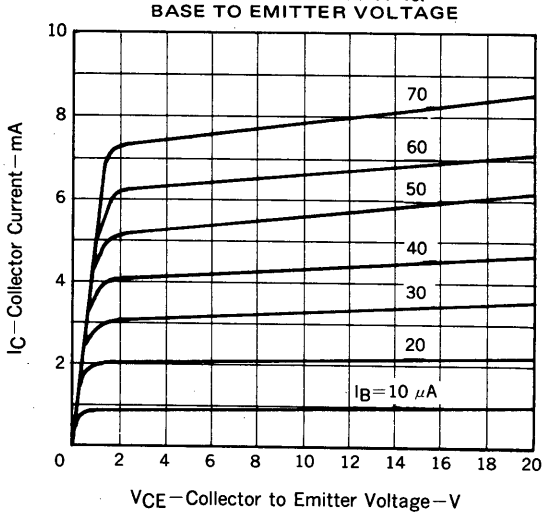
TYPICAL CHARACTERISTICS (T_a = 25 °C)

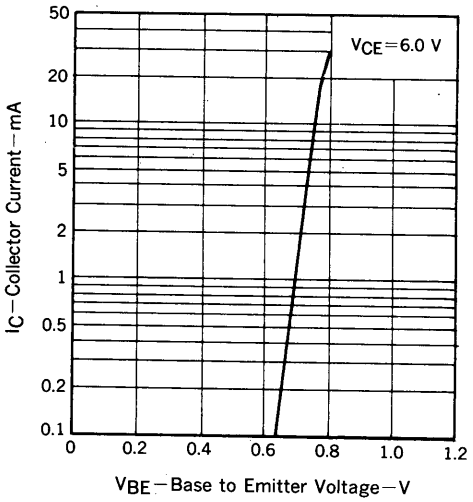
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



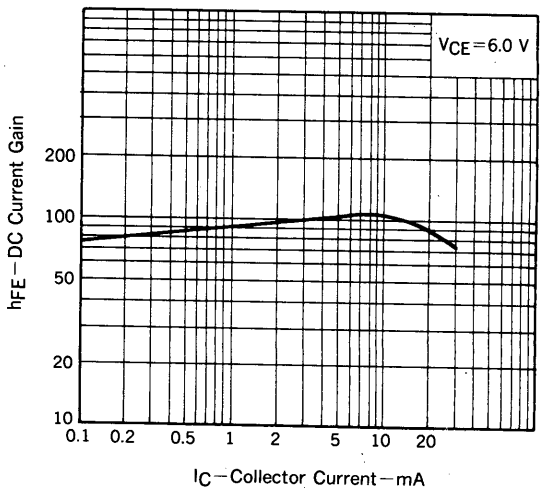
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



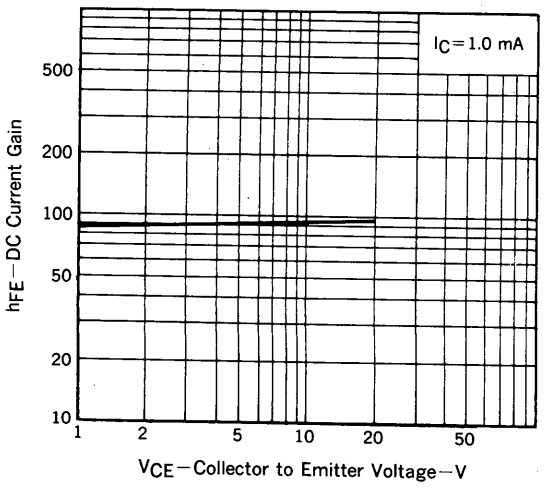
DC CURRENT GAIN vs. COLLECTOR TO EMITTER VOLTAGE



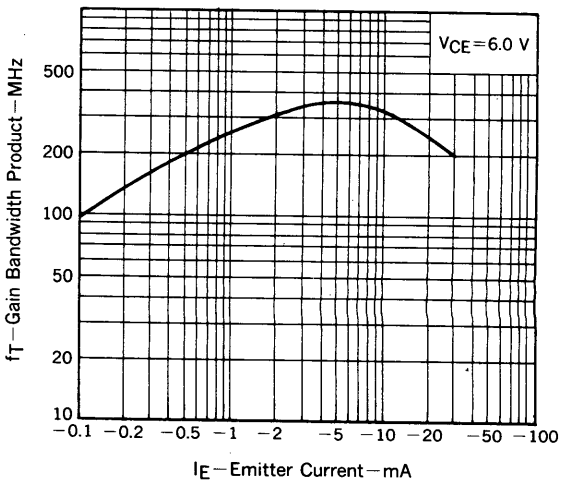
DC CURRENT GAIN vs. COLLECTOR CURRENT



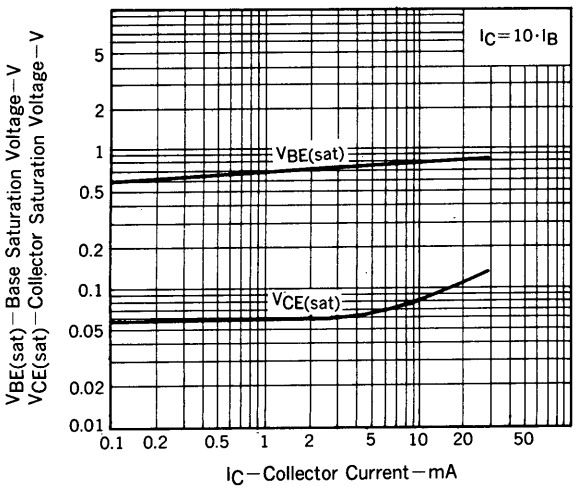
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



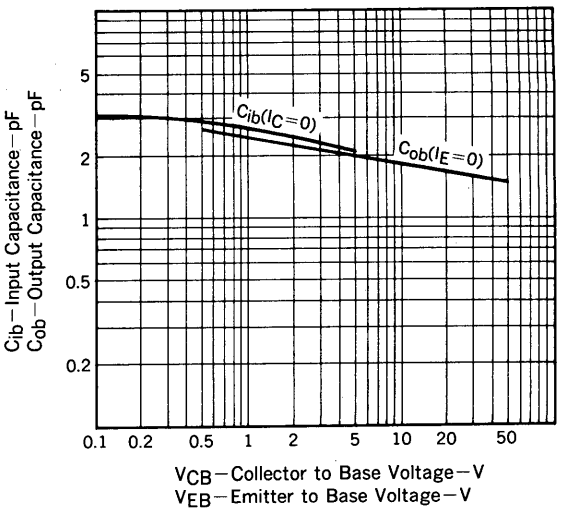
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



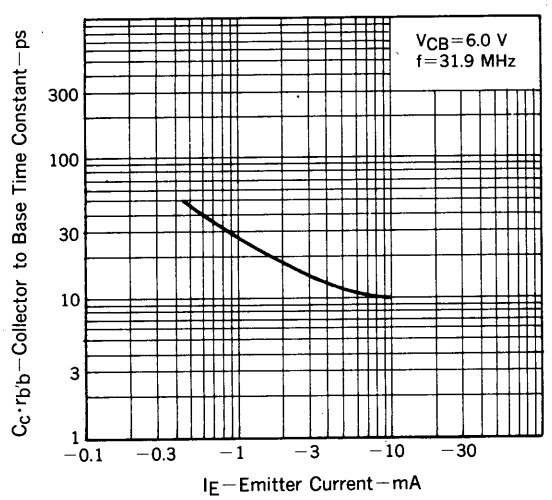
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



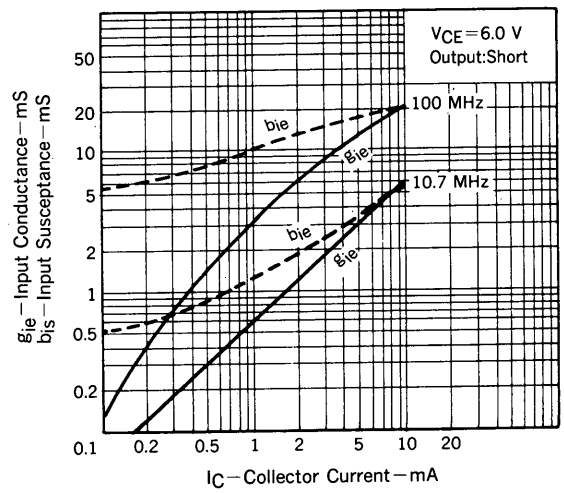
INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



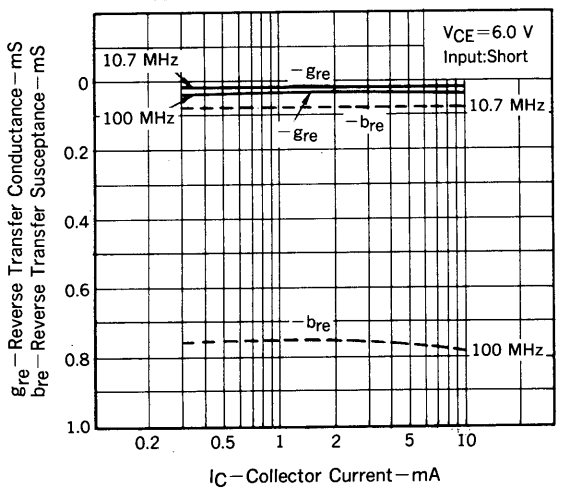
COLLECTOR TO BASE TIME CONSTANT vs. EMITTER CURRENT



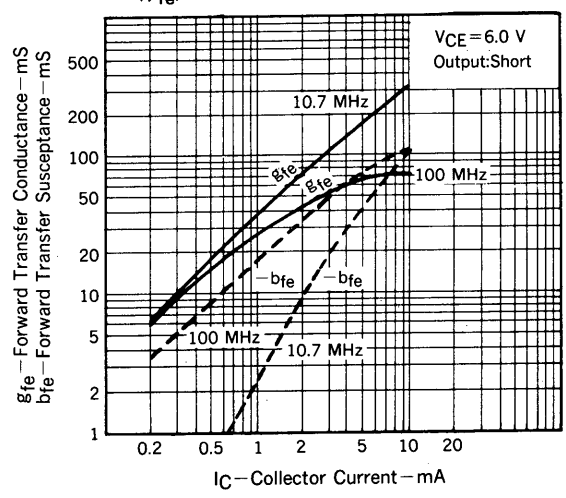
INPUT ADMITTANCE (v_{ie}) vs. COLLECTOR CURRENT



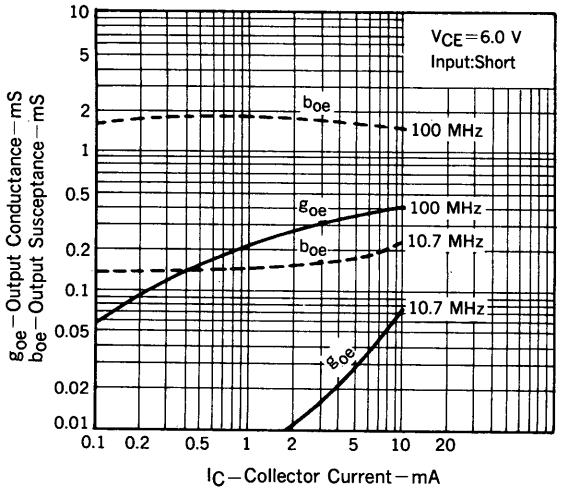
REVERSE TRANSFER ADMITTANCE (v_{re}) vs. COLLECTOR CURRENT



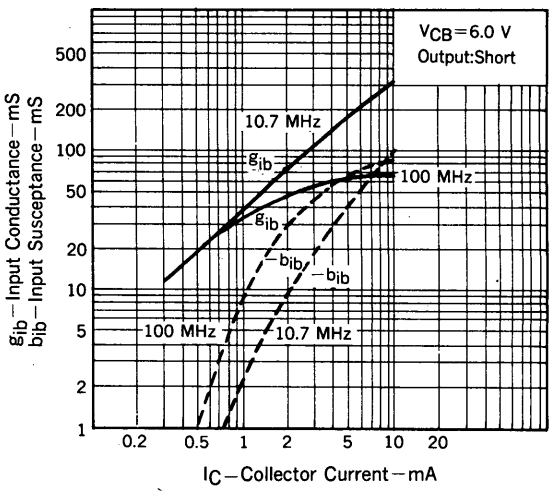
FORWARD TRANSFER ADMITTANCE (v_{fe}) vs. COLLECTOR CURRENT



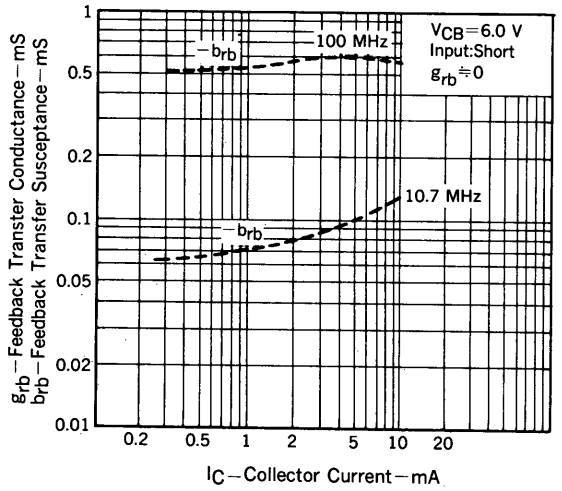
OUTPUT ADMITTANCE (y_{oe}) vs. COLLECTOR CURRENT



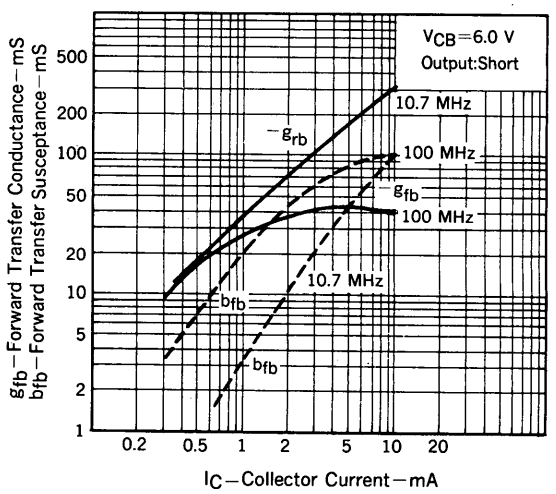
INPUT ADMITTANCE (y_{ib}) vs. COLLECTOR CURRENT



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



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



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