NEC
ELECTRON DEVICE

NPN SILICON TRANSISTOR
2SC1399

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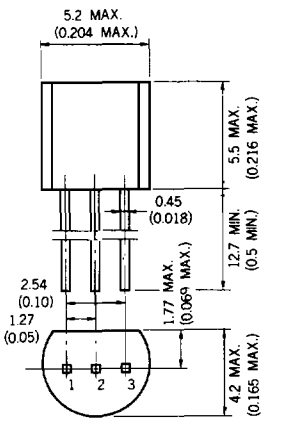
DESCRIPTION The 2SC1399 is designed for use in driver stage of AF amplifier, and low speed swiching.

FEATURES

- High Voltage
  - V_{CEO} : 80 V
- High h_{FE} and Excellent h_{FE} Linearity
  - h_{FE} (I_C = 0.5 mA, V_{CE} = 3 V) : 600 TYP.
  - h_{FE1} (0.1 mA)/h_{FE2} (1.0 mA)(V_{CE} = 3 V) : 0.92 TYP.

PACKAGE DIMENSIONS
in millimeters (inches)



1. EMITTER
2. COLLECTOR
3. BASE

EIAJ : SC-43
JEDEC : TO-92
IEC : PA33

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

- Storage Temperature . . . . . −55 to +125 °C
- Junction Temperature . . . . . +125 °C Maximum

Maximum Power Dissipation (Ta = 25 °C)

- Total Power Dissipation . . . . . 250 mW

Maximum Voltages and Currents (Ta = 25 °C)

- V_{CBO} Collector to Base Voltage . . . . . 100 V
- V_{CEO} Collector to Emitter Voltage . . . . . 80 V
- V_{EBO} Emitter to Base Voltage . . . . . 5.0 V
- I_C Collector Current . . . . . 50 mA
- I_B Base Current . . . . . 10 mA

ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h_{FE1}	DC Current Gain	170	560		−	V_{CE}=3.0 V, I_C=0.1 mA
h_{FE2}	DC Current Gain	225	600	1000	−	V_{CE}=3.0 V, I_C=0.5 mA
NF	Noise Figure			20	dB	V_{CE}=6.0 V, I_C=0.3 mA, R_G=2.0 kΩ, f=100 Hz
f_T	Gain Bandwidth Product	50	100		MHz	V_{CE}=6.0 V, I_E=−1.0 mA
C_{ob}	Collector to Base Capacitance		2.7	5.0	pF	V_{CB}=6.0 V, I_E=0, f=1.0 MHz
I_{CBO}	Collector Cutoff Current			50	nA	V_{CB}=100 V, I_E=0
I_{CEO}	Collector Cutoff Current			1.0	μA	V_{CE}=60 V, I_B=0
I_{EBO}	Emitter Cutoff Current			50	nA	V_{EB}=5.0 V, I_C=0
$V_{CE(sat)}$	Collector Saturation Voltage		0.09	0.3	V	I_C=50 mA, I_B=5.0 mA
$V_{BE(sat)}$	Base Saturation Voltage		0.81	1.0	V	I_C=50 mA, I_B=5.0 mA

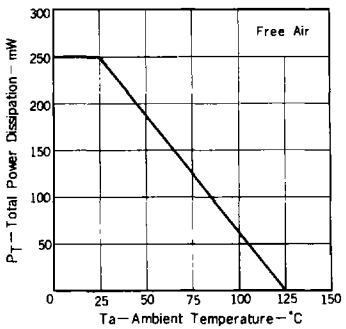
Classification of h_{FE2}

Rank	F	E	U
Range	225 − 450	350 − 700	500 − 1000

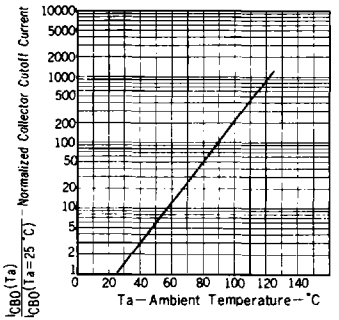
h_{FE} Test Conditions : V_{CE} = 3.0 V, I_C = 0.5 mA

TYPICAL CHARACTERISTICS (Ta = 25 °C unless otherwise noted)

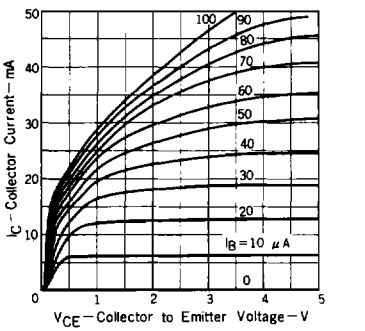
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



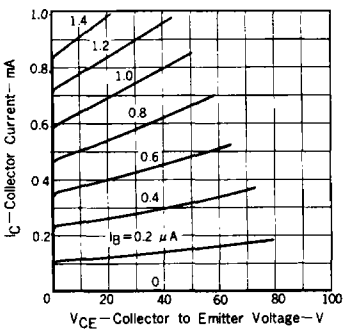
NORMALIZED COLLECTOR CUTOFF CURRENT vs. AMBIENT TEMPERATURE



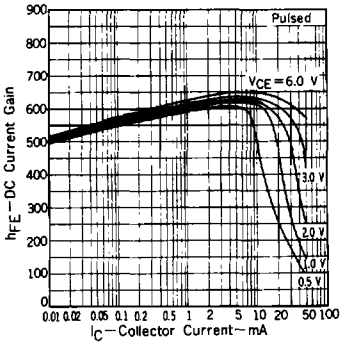
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



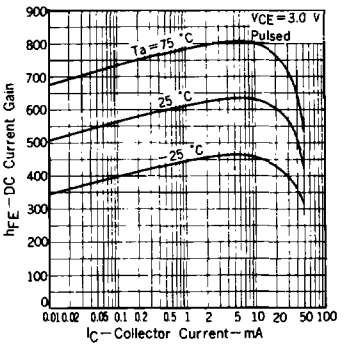
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



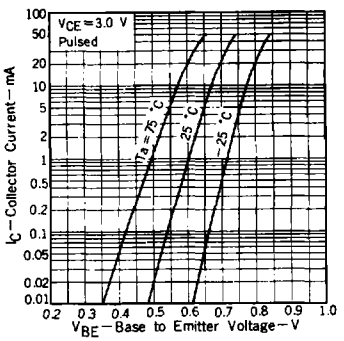
DC CURRENT GAIN vs. COLLECTOR CURRENT



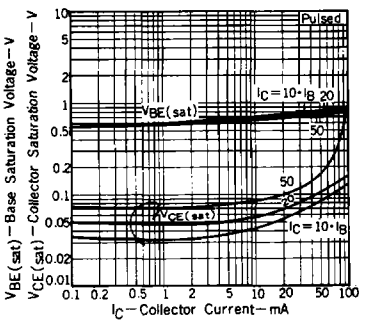
DC CURRENT GAIN vs. COLLECTOR CURRENT



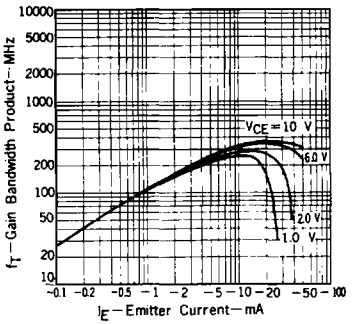
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



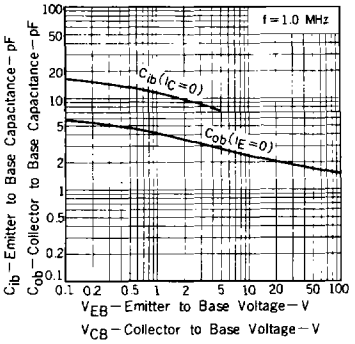
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



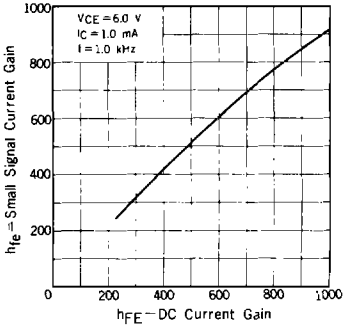
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



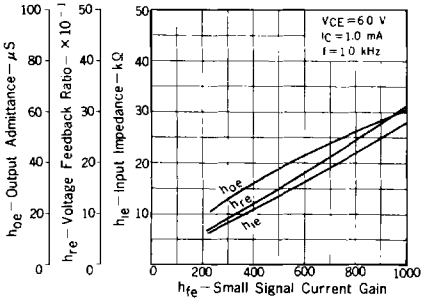
COLLECTOR TO BASE AND EMITTER TO BASE CAPACITANCE vs. REVERSE VOLTAGE



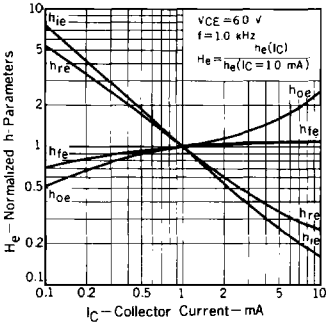
SMALL SIGNAL CURRENT GAIN vs. DC CURRENT GAIN



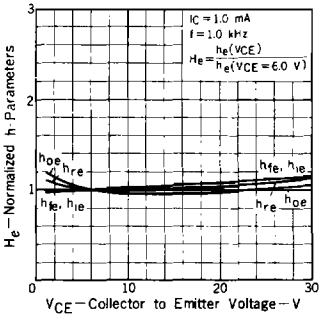
INPUT IMPEDANCE, VOLTAGE FEEDBACK RATIO AND OUTPUT ADMITTANCE vs. SMALL SIGNAL CURRENT GAIN



NORMALIZED h-PARAMETERS vs. COLLECTOR CURRENT



NORMALIZED h-PARAMETERS vs. COLLECTOR TO EMITTER VOLTAGE



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