

SILICON TRANSISTOR

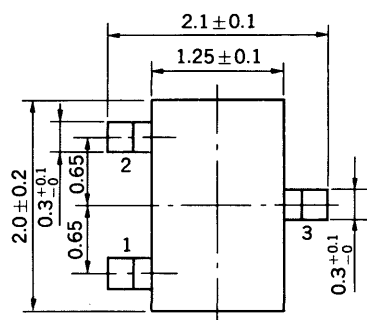
2SC4177

AUDIO FREQUENCY GENERAL PURPOSE AMPLIFIER

NPN SILICON EPITAXIAL TRANSISTOR

PACKAGE DIMENSIONS

in millimeters



1 : Emitter
 2 : Base
 3 : Collector

FEATURES

- Complementary to 2SA1611
- High DC Current Gain: $h_{FE} = 200$ TYP. ($V_{CE} = 6.0$ V, $I_C = 1.0$ mA)
- High Voltage: $V_{CEO} = 50$ V

ABSOLUTE MAXIMUM RATINGS

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

Collector to Base Voltage	V_{CBO}	60	V
Collector to Emitter Voltage	V_{CEO}	50	V
Emitter to Base Voltage	V_{EBO}	5.0	V
Collector Current (DC)	I_C	100	mA

Maximum Power Dissipation

Total Power Dissipation at 25°C Ambient Temperature	P_T	150	mW
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Maximum Temperatures

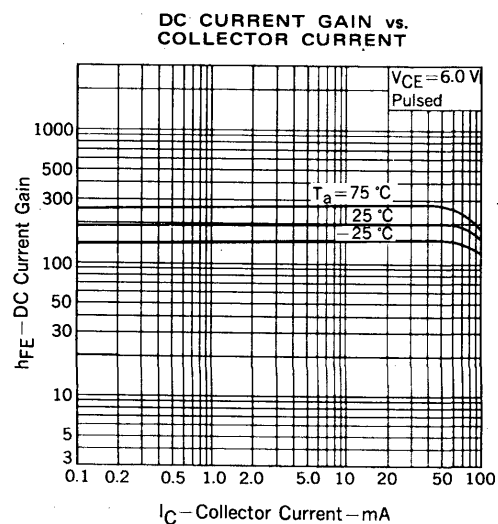
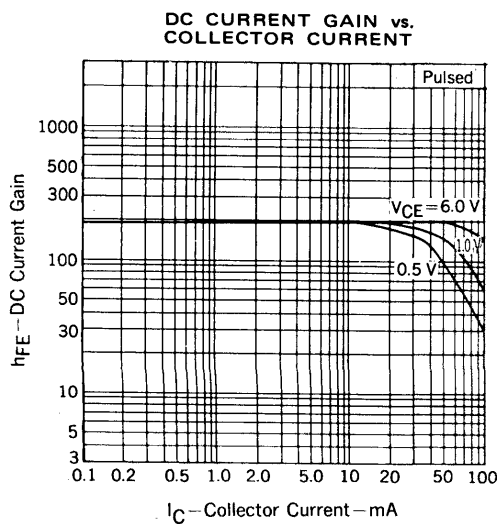
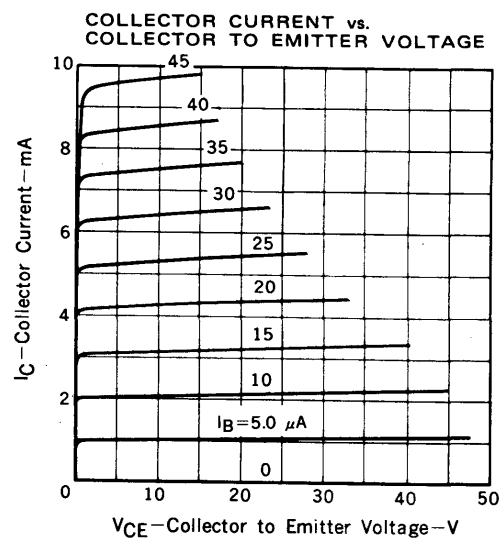
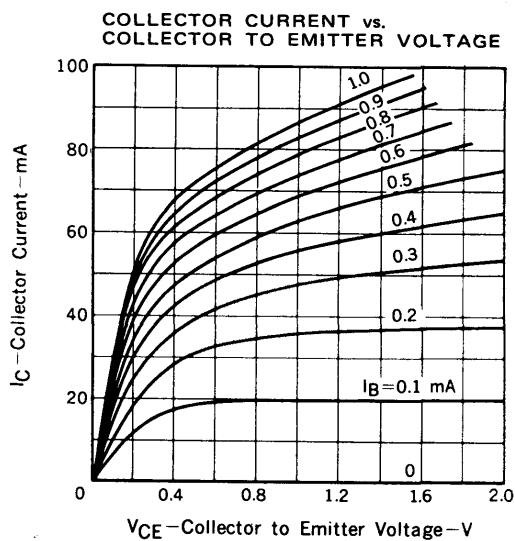
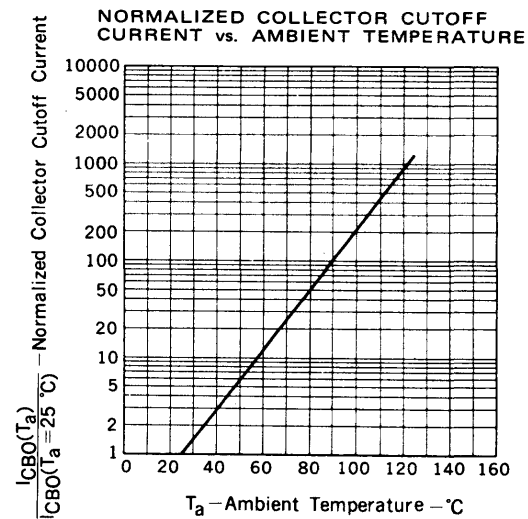
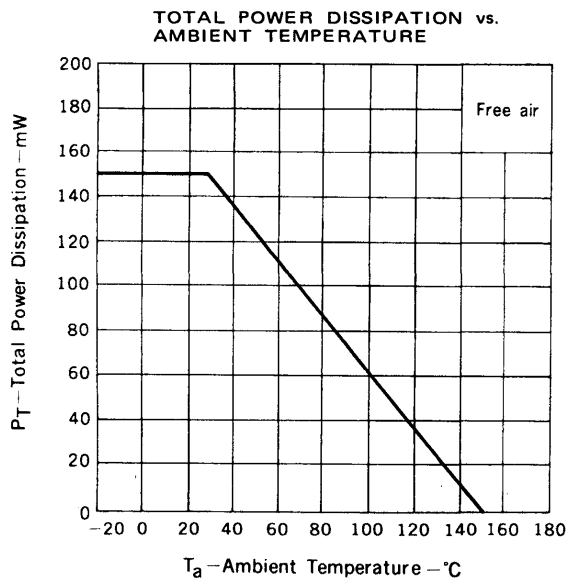
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

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

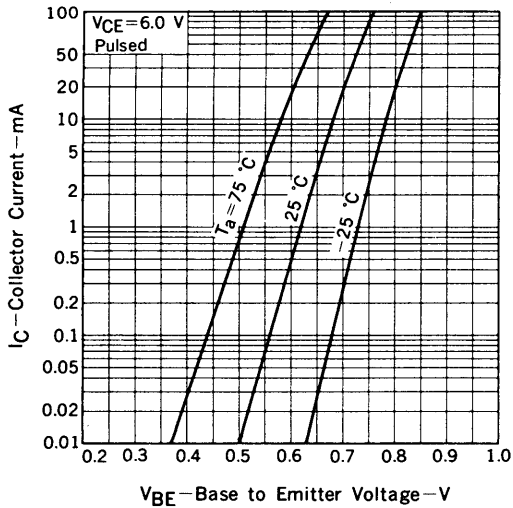
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			0.1	μA	$V_{CB} = 60$ V, $I_E = 0$
Emitter Cutoff Current	I_{EBO}			0.1	μA	$V_{EB} = 5.0$ V, $I_C = 0$
DC Current Gain	h_{FE}	90	200	600		$V_{CE} = 6.0$ V, $I_C = 1.0$ mA*
Collector Saturation Voltage	$V_{CE(sat)}$		0.15	0.3	V	$I_C = 100$ mA, $I_B = 10$ mA
Base to Saturation Voltage	$V_{BE(sat)}$		0.86	1.0	V	$I_C = 100$ mA, $I_B = 10$ mA
Base Emitter Voltage	V_{BE}	0.55	0.62	0.65	V	$V_{CE} = 6.0$ V, $I_C = 1.0$ mA
Gain Bandwidth Product	f_T		250		MHz	$V_{CE} = 6.0$ V, $I_E = -10$ mA
Output Capacitance	C_{ob}		3.0		pF	$V_{CB} = 6.0$ V, $I_E = 0$, $f = 1.0$ MHz

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

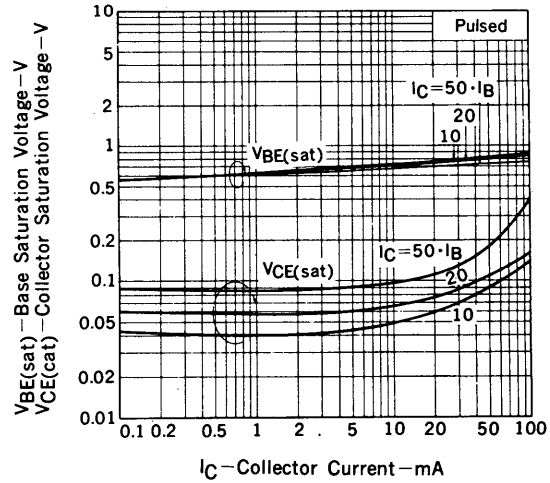
Marking	L4	L5	L6	L7
h_{FE}	90 to 180	135 to 270	200 to 400	300 to 600

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

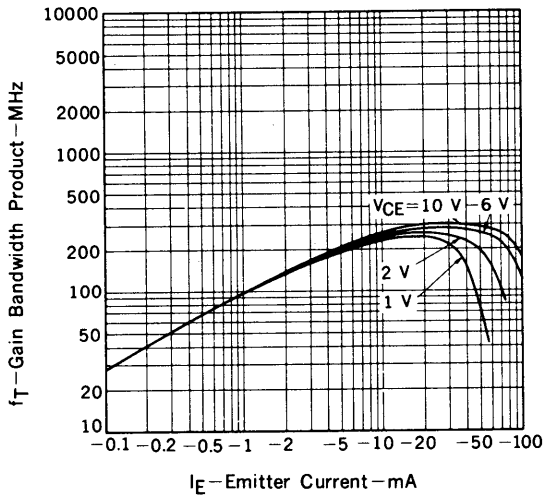
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



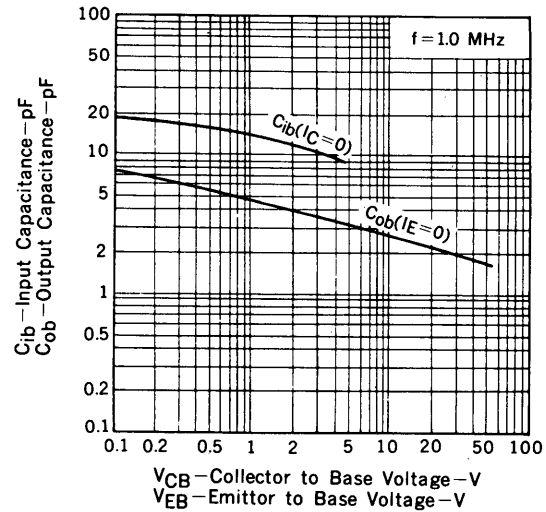
COLLECTOR AND BASE SATURATION
VOLTAGE vs. COLLECTOR CURRENT



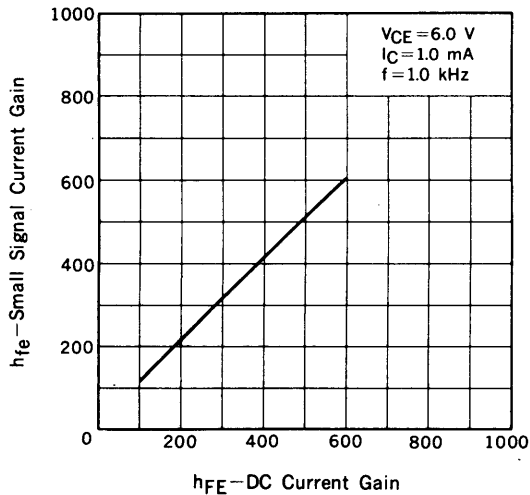
GAIN BANDWIDTH PRODUCT vs.
EMITTER CURRENT



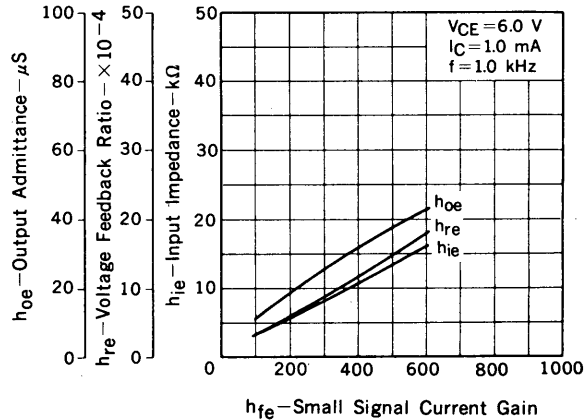
OUTPUT AND INPUT CAPACITANCE
vs. REVERSE VOLTAGE

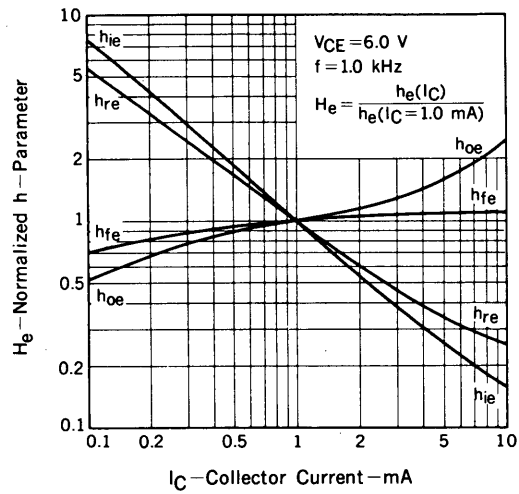


SMALL SIGNAL CURRENT GAIN vs.
DC CURRENT GAIN



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



NORMALIZED h-PARAMETER vs.
COLLECTOR CURRENTNORMALIZED h-PARAMETER vs.
COLLECTOR TO EMITTER VOLTAGE