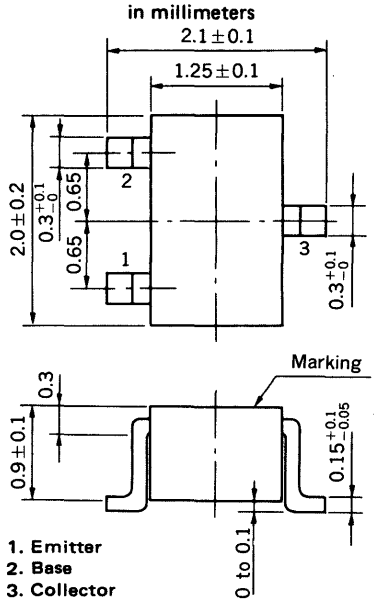
DATA SHEET

NEC
ELECTRON DEVICE

SILICON TRANSISTORS
2SC4181, 2SC4181A

AUDIO FREQUENCY AMPLIFIER, SWITCHING
NPN SILICON EPITAXIAL TRANSISTORS

PACKAGE DIMENSIONS
in millimeters



1. Emitter
2. Base
3. Collector

FEATURES

- High DC Current Gain : h_{FE} = 1 000 to 3 200
- Low $V_{CE(sat)}$: $V_{CE(sat)}$ = 0.07 V TYP.
- High V_{EBO} : V_{EBO} = 15 V (2SC4181A)

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Current (T_a = 25 °C)		2SC4181	2SC4181A	
Collector to Base Voltage	V_{CBO}	60		V
Collector to Emitter Voltage	V_{CEO}	50		V
Emitter to Base Voltage	V_{EBO}	12	15	V
Collector Current (DC)	I_C	150		mA
Maximum Power Dissipation				
Total Power Dissipation at 25 °C Ambient Temperature	P_T	150		mW
Maximum Temperatures				
Junction Temperature	T_j	150		°C
Storage Temperature Range	T_{stg}	−55 to +150		°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			100	nA	V_{CB} = 50 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			100	nA	V_{EB} = 10 V, I_C = 0
DC Current Gain	h_{FE1}*	1000	1800	3200		V_{CE} = 5.0 V, I_C = 1.0 mA
DC Current Gain	h_{FE2}*	200	350			V_{CE} = 5.0 V, I_C = 100 mA
Base to Emitter Voltage	V_{BE}*		0.56		V	V_{CE} = 5.0 V, I_C = 1.0 mA
Collector Saturation Voltage	$V_{CE(sat)}$*		0.07	0.3	V	I_C = 50 mA, I_B = 5.0 mA
Base Saturation Voltage	$V_{BE(sat)}$*		0.8	1.2	V	I_C = 50 mA, I_B = 5.0 mA
Gain Bandwidth Product	f_T		250		MHz	V_{CE} = 5.0 V, I_E = −10 mA
Output Capacitance	C_{ob}		3.0		pF	V_{CB} = 5 V, I_E = 0, f = 1.0 MHz
Turn-on Time	t_{on}		0.13		ns	V_{CC} = 10 V, $V_{BE(off)}$ ≒ −2.7 V
Storage Time	t_{stg}		0.72		ns	I_C = 50 mA
Turn-off Time	t_{off}		1.22		ns	I_{B1} = −I_{B2} = 1.0 mA

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

h_{FE} Classification

Marking	2SC4181	L17	L18
	2SC4181A	L15	L16
h_{FE1}		1000 to 2000	1600 to 3200

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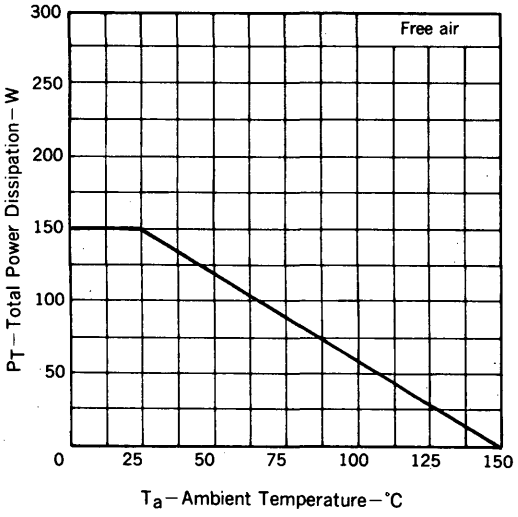
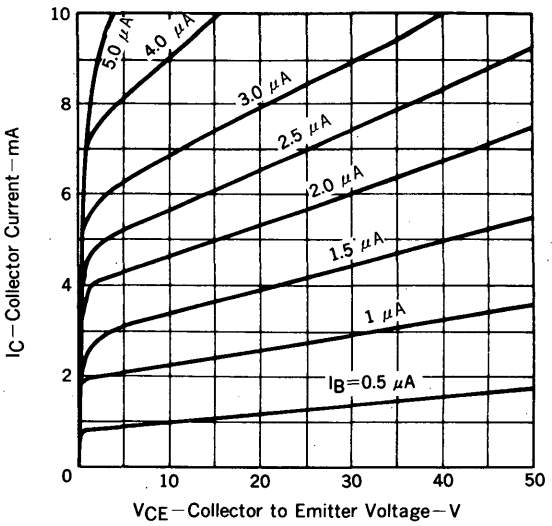
TYPICAL CHARACTERISTICS (T_a = 25 °C)

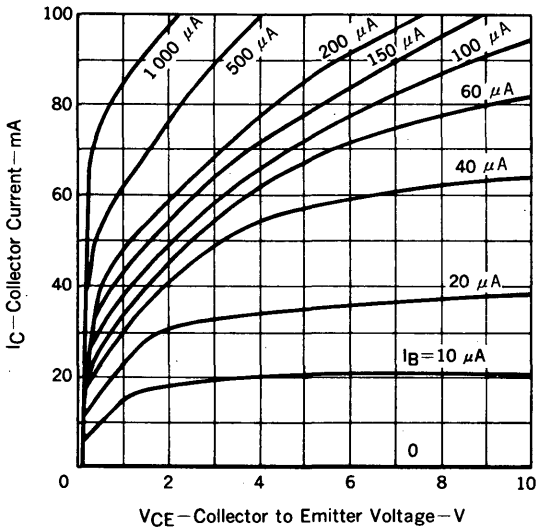
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



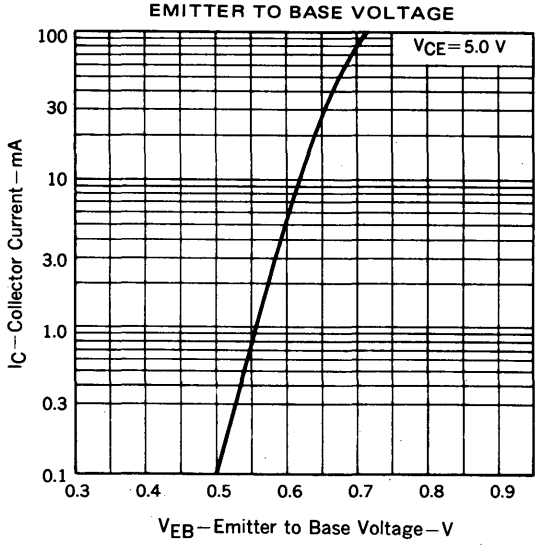
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



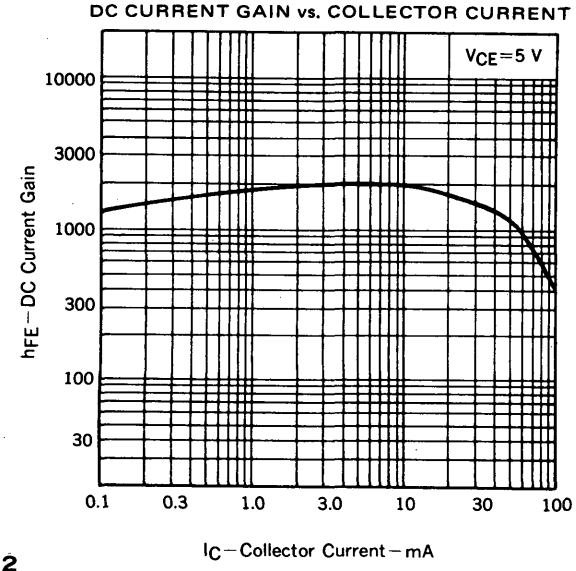
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



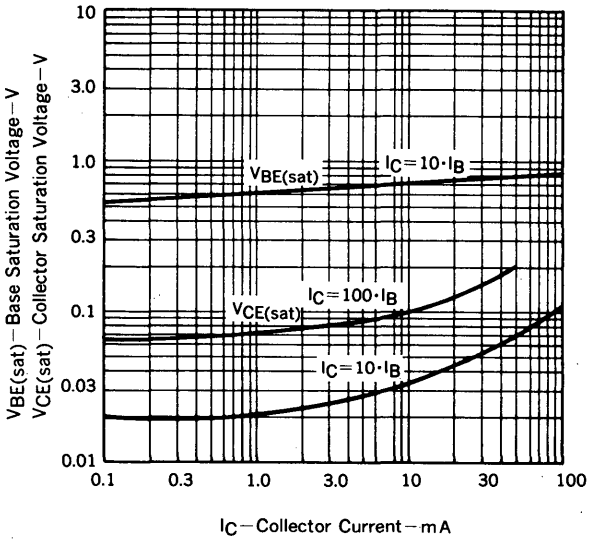
COLLECTOR CURRENT vs. EMITTER TO BASE VOLTAGE



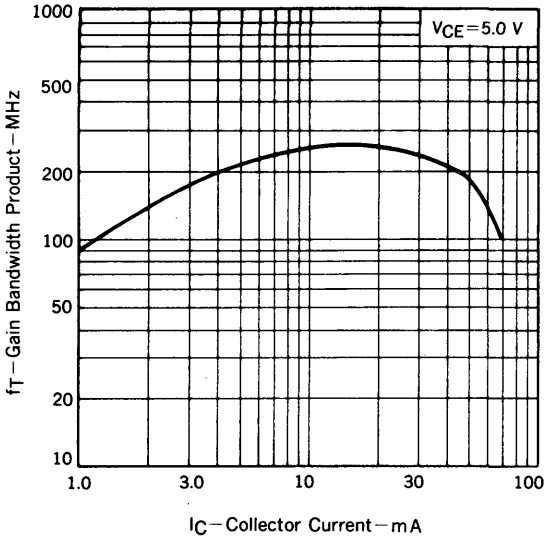
DC CURRENT GAIN vs. COLLECTOR CURRENT



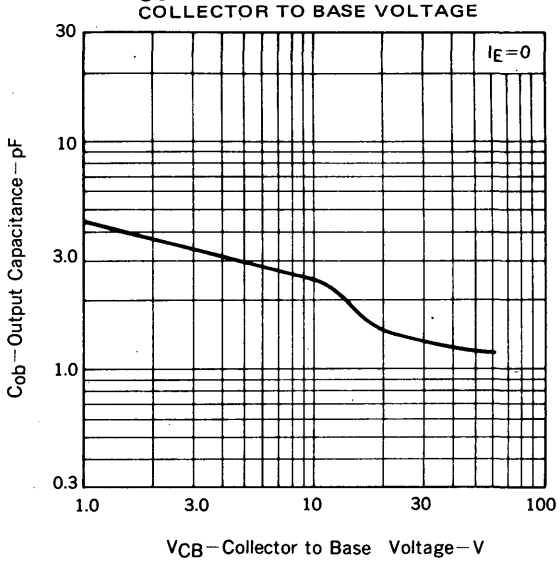
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



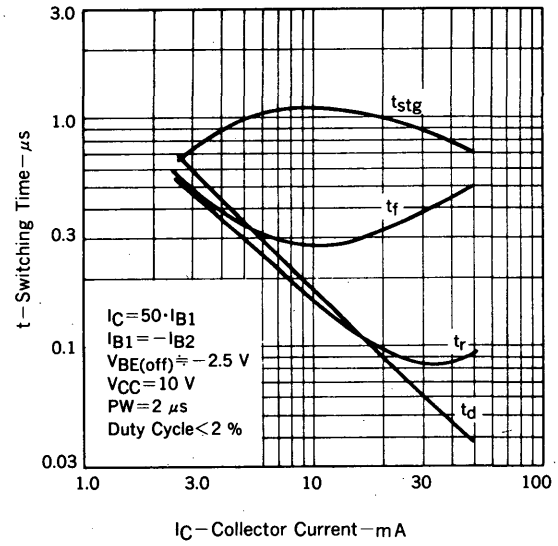
GAIN BANDWIDTH PRODUCT vs.
COLLECTOR CURRENT



OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE



SWITCHING TIME vs. COLLECTOR CURRENT



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