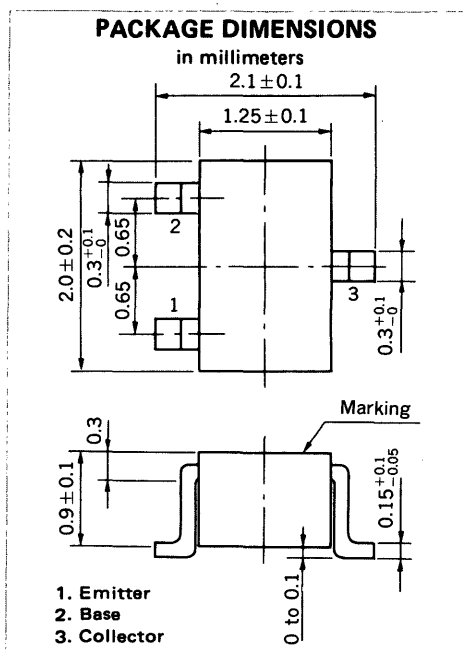


SILICON TRANSISTORS
2SC4181, 2SC4181A

AUDIO FREQUENCY AMPLIFIER, SWITCHING
NPN SILICON EPITAXIAL TRANSISTORS



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 ($T_a = 25\ ^\circ C$) | | 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 $25\ ^\circ C$ Ambient Temperature | P_T | 150 | | mW |
| Maximum Temperatures | | | | |
| Junction Temperature | T_j | 150 | | $^\circ C$ |
| Storage Temperature Range | T_{stg} | -55 to +150 | | $^\circ C$ |

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

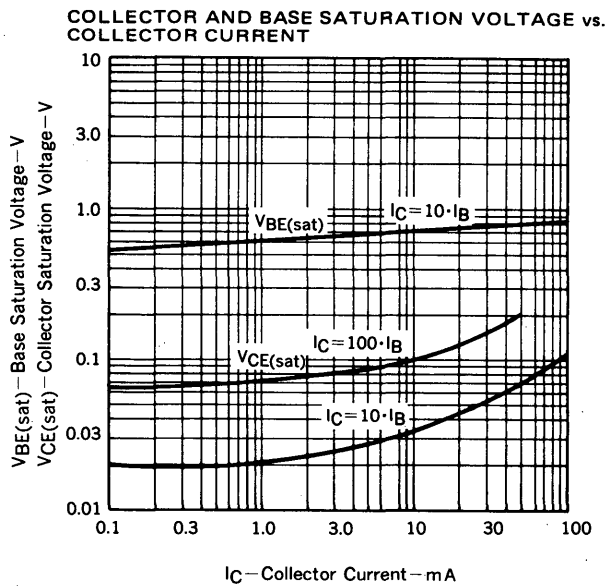
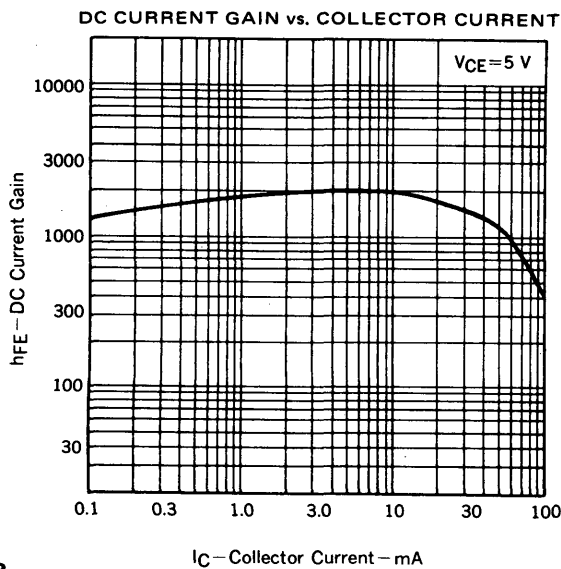
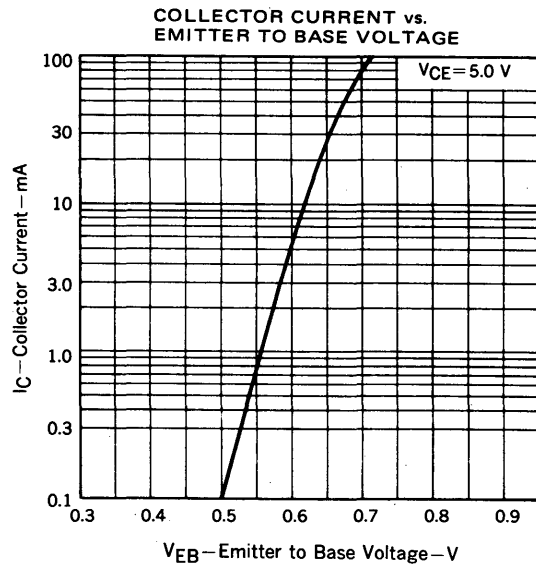
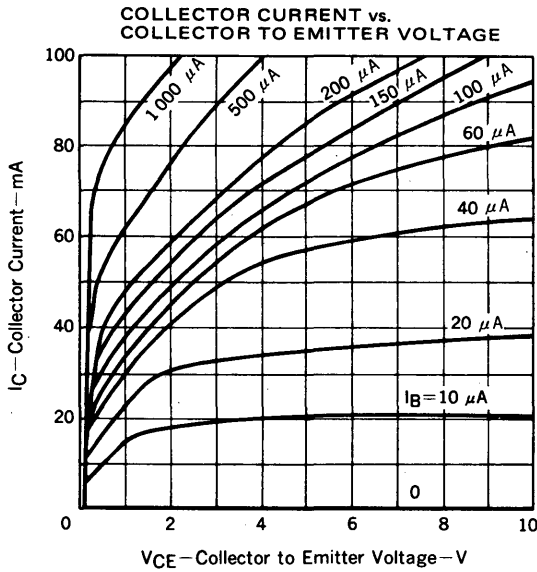
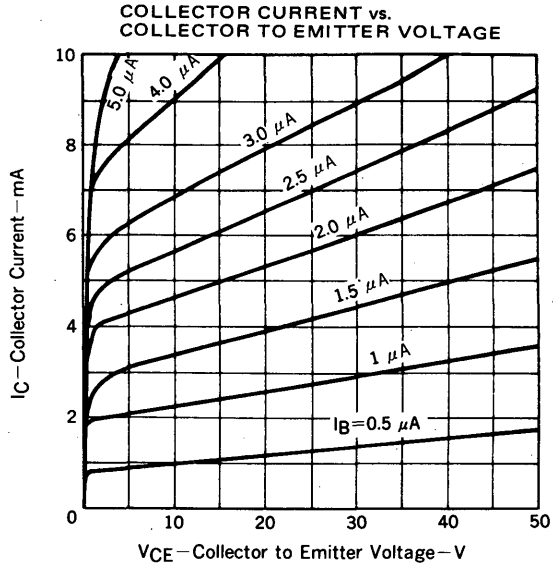
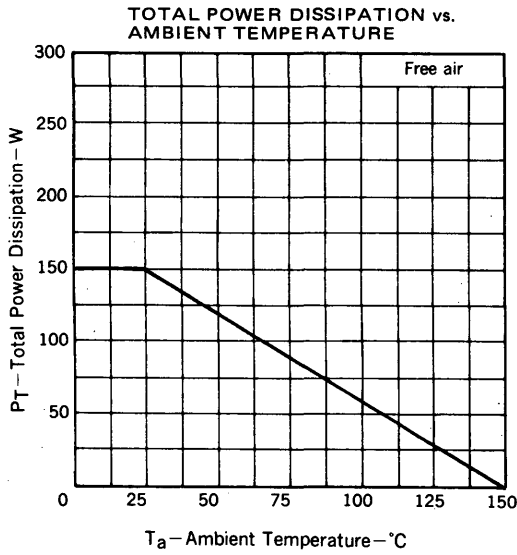
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|------------------------------|-----------------|------|------|------|------|-----------------------------------------|
| Collector Cutoff Current | I_{CBO} | | | 100 | nA | $V_{CB} = 50\ V, I_E = 0$ |
| Emitter Cutoff Current | 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: $PW \leq 350\ \mu s$, Duty Cycle $\leq 2\ %$

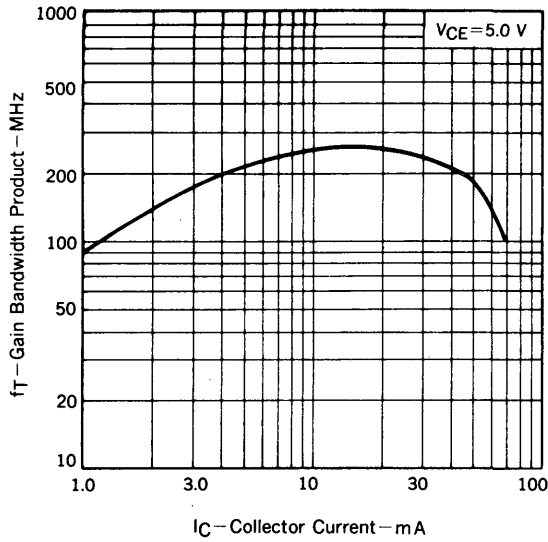
h_{FE} Classification

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

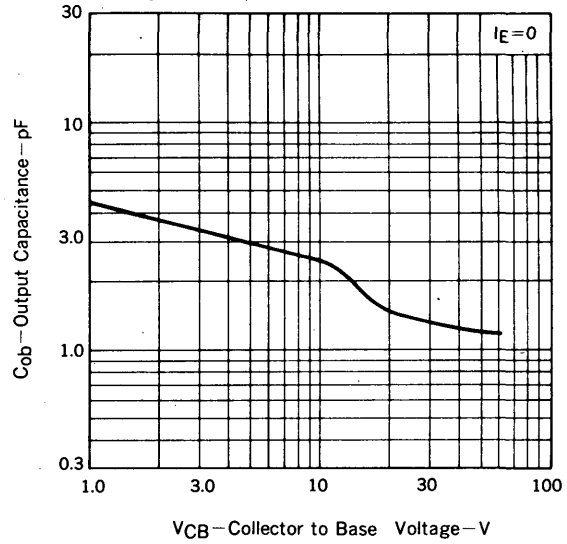
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



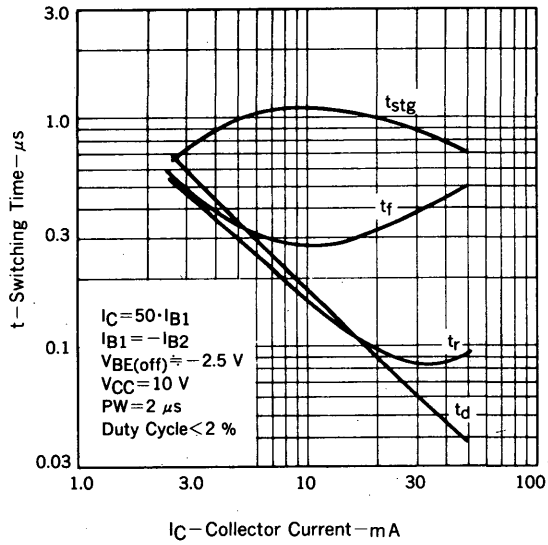
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



SWITCHING TIME vs. COLLECTOR CURRENT



[MEMO]

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