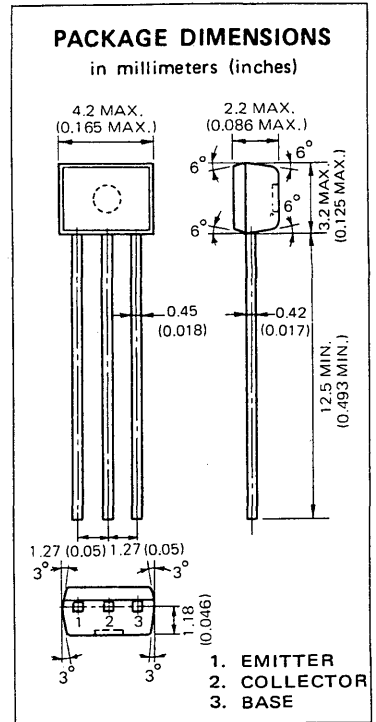


**DESCRIPTION** The 2SC2784 is the best for use as the middle range amplifier in Hi-Fi stereo control amplifiers, power amplifiers, and etc.

- FEATURES**
- High voltage.  $V_{CEO} : 120 \text{ V}$
  - Low output capacitance.  $C_{ob} : 1.6 \text{ pF TYP. (} V_{CB} = 30 \text{ V)}$
  - High  $h_{FE}$   $h_{FE} : 600 \text{ TYP. (} V_{CE} = 6.0 \text{ V, } I_C = 1.0 \text{ mA)}$
  - Super low noise.  $NV : 25 \text{ mV TYP. (See test circuit.)}$
  - Complementary to the NEC 2SA1174 PNP transistor.

**ABSOLUTE MAXIMUM RATINGS**

- Maximum Temperatures
- Storage Temperature .....  $-55 \text{ to } +125 \text{ }^\circ\text{C}$
  - Junction Temperature .....  $+125 \text{ }^\circ\text{C Maximum}$
- Maximum Power Dissipation ( $T_a = 25 \text{ }^\circ\text{C}$ )
- Total Power Dissipation .....  $300 \text{ mW}$
- Maximum Voltages and Currents ( $T_a = 25 \text{ }^\circ\text{C}$ )
- $V_{CBO}$  Collector to Base Voltage .....  $120 \text{ V}$
  - $V_{CEO}$  Collector to Emitter Voltage .....  $120 \text{ V}$
  - $V_{EBO}$  Emitter to Base Voltage .....  $5.0 \text{ V}$
  - $I_C$  Collector Current .....  $50 \text{ mA}$
  - $I_B$  Base Current .....  $10 \text{ mA}$



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

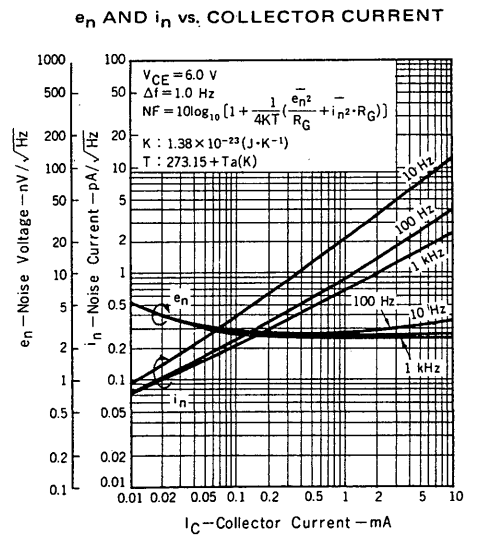
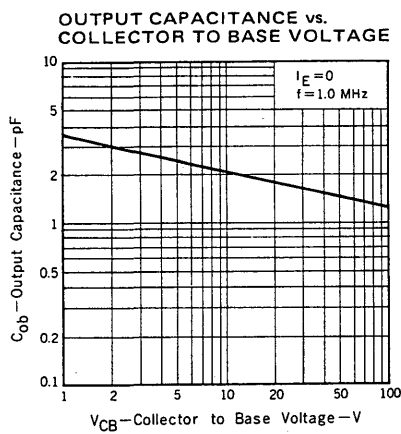
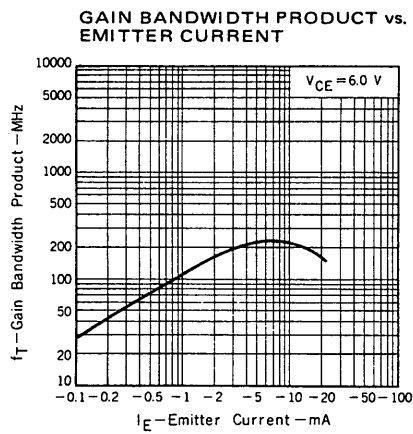
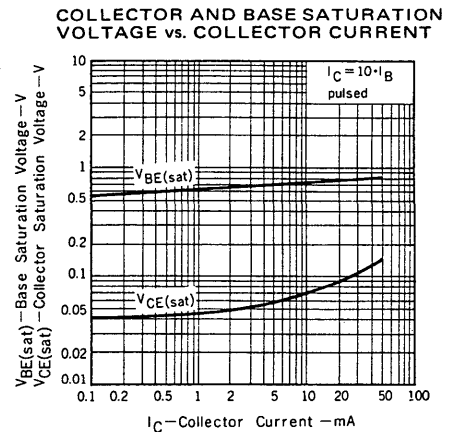
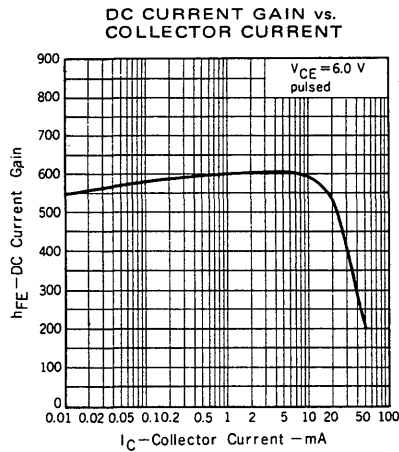
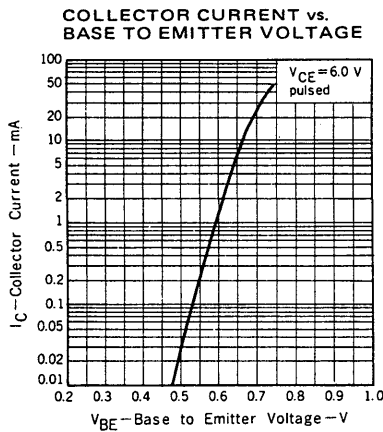
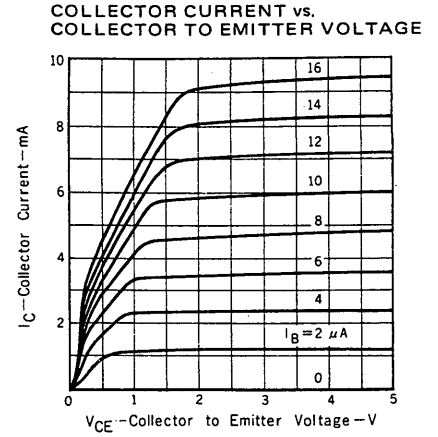
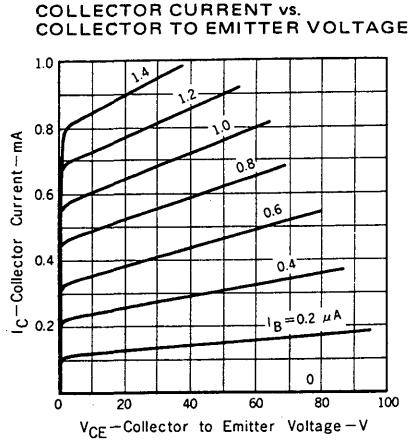
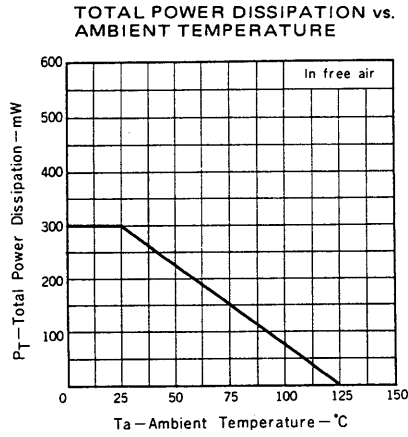
| SYMBOL        | CHARACTERISTIC               | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS  |
|---------------|------------------------------|------|------|------|------|--|
| $h_{FE1}$     | DC Current Gain              | 150  | 580  |      | —    | $V_{CE}=6.0 \text{ V, } I_C=0.1 \text{ mA}$  |
| $h_{FE2}$     | DC Current Gain              | 200  | 600  | 1200 | —    | $V_{CE}=6.0 \text{ V, } I_C=1.0 \text{ mA}$  |
| $f_T$         | Gain Bandwidth Product       | 50   | 110  |      | MHz  | $V_{CE}=6.0 \text{ V, } I_E=1.0 \text{ mA}$  |
| $C_{ob}$      | Output Capacitance           |      | 1.6  | 2.5  | pF   | $V_{CB}=30 \text{ V, } I_E=0, f=1.0 \text{ MHz}$   |
| $NV$          | Noise Voltage                |      | 25   | 40   | mV   | $V_{CE}=5.0 \text{ V, } I_C=1.0 \text{ mA, } R_G=100 \text{ k}\Omega$<br>$G_V=80 \text{ dB, } f=10 \text{ Hz to } 1.0 \text{ kHz}$ |
| $I_{CBO}$     | Collector Cutoff Current     |      |      | 50   | nA   | $V_{CB}=120 \text{ V, } I_E=0$   |
| $I_{EBO}$     | Emitter Cutoff Current       |      |      | 50   | nA   | $V_{EB}=5.0 \text{ V, } I_C=0$   |
| $V_{BE}$      | Base to Emitter Voltage      | 0.55 | 0.59 | 0.65 | V    | $V_{CE}=6.0 \text{ V, } I_C=1.0 \text{ mA}$  |
| $V_{CE(sat)}$ | Collector Saturation Voltage |      | 0.07 | 0.30 | V    | $I_C=10 \text{ mA, } I_B=1.0 \text{ mA}$   |

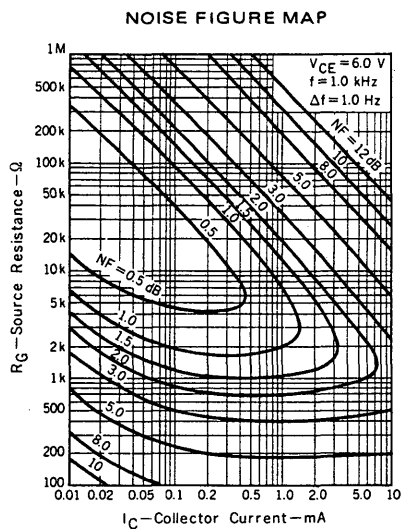
Classification of  $h_{FE2}$

| Rank  | P         | F         | E         | U          |
|-------|-----------|-----------|-----------|------------|
| Range | 200 – 400 | 300 – 600 | 400 – 800 | 600 – 1200 |

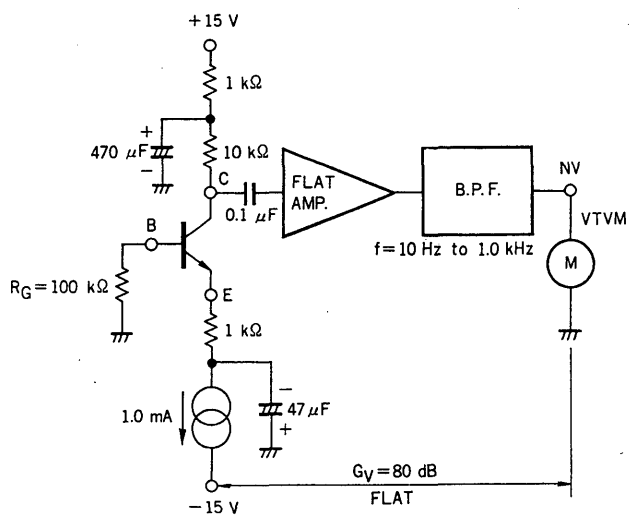
$h_{FE2}$  Test Conditions :  $V_{CE}=6.0 \text{ V, } I_C=1.0 \text{ mA}$

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





**NOISE VOLTAGE TEST CIRCUIT**



$V_{CE} \approx 5 \text{ V}$ ,  $I_C = 1.0 \text{ mA}$ ,  $R_G = 100 \text{ k}\Omega$ ,  $G_V = 80 \text{ dB}$ , FLAT( $f = 10 \text{ Hz to } 1.0 \text{ kHz}$ )