

**DESCRIPTION** The 2SA733 is designed for use in driver stage of AF amplifier.

**FEATURES**

- High  $h_{FE}$  and Excellent Linearity : 200 TYP.  
 $h_{FE}$  ( $V_{CE} = -6.0$  V,  $I_C = -1.0$  mA)

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures

Storage Temperature ..... -55 to +125 °C

Junction Temperature ..... +125 °C Maximum

Maximum Power Dissipation ( $T_a = 25$  °C)

Total Power Dissipation ..... 250 mW

Maximum Voltages and Currents ( $T_a = 25$  °C)

$V_{CBO}$  Collector to Base Voltage ..... -60 V

$V_{CEO}$  Collector to Emitter Voltage ..... -50 V

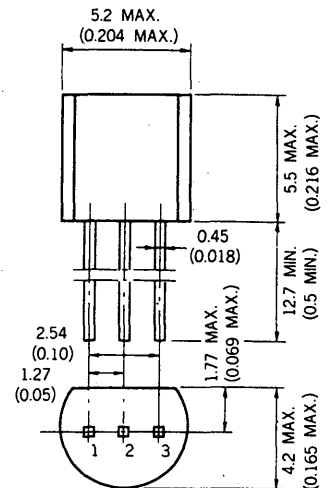
$V_{EBO}$  Emitter to Base Voltage ..... -5.0 V

$I_C$  Collector Current ..... -100 mA

$I_B$  Base Current ..... -20 mA

**PACKAGE DIMENSIONS**

in millimeters (inches)



- 1. EMITTER EIAJ : SC-43B
- 2. COLLECTOR JEDEC : TO-92
- 3. BASE IEC : PA33

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**ELECTRICAL CHARACTERISTICS ( $T_a = 25$  °C)**

| SYMBOL        | CHARACTERISTIC               | MIN.  | TYP.  | MAX.  | UNIT    | TEST CONDITIONS  |
|---------------|------------------------------|-------|-------|-------|---------|--|
| $h_{FE}$      | DC Current Gain              | 90    | 200   | 600   |         | $V_{CE} = -6.0$ V, $I_C = -1.0$ mA                                       |
| NF            | Noise Figure                 |       | 6.0   | 20    | dB      | $V_{CE} = -6.0$ V, $I_C = -0.3$ mA, $R_G = 10$ k $\Omega$ , $f = 100$ Hz |
| $f_T$         | Gain Bandwidth Product       | 100   | 180   |       | MHz     | $V_{CE} = -6.0$ V, $I_E = 10$ mA   |
| $C_{ob}$      | Output Capacitance           |       | 4.5   | 6.0   | pF      | $V_{CB} = -10$ V, $I_E = 0$ , $f = 1.0$ MHz                              |
| $I_{CBO}$     | Collector Cutoff Current     |       |       | -0.1  | $\mu$ A | $V_{CB} = -60$ V, $I_E = 0$  |
| $I_{EBO}$     | Emitter Cutoff Current       |       |       | -0.1  | $\mu$ A | $V_{EB} = -5.0$ V, $I_C = 0$   |
| $V_{BE}$      | Base to Emitter Voltage      | -0.58 | -0.62 | -0.68 | V       | $V_{CE} = -6.0$ V, $I_C = -1.0$ mA                                       |
| $V_{CE(sat)}$ | Collector Saturation Voltage |       | -0.18 | -0.3  | V       | $I_C = -100$ mA, $I_B = -10$ mA  |

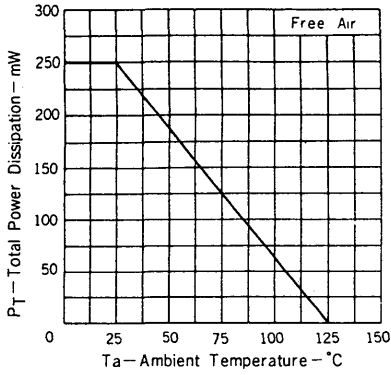
**Classification of  $h_{FE}$**

| Rank  | R        | Q         | P         | K         |
|-------|----------|-----------|-----------|-----------|
| Range | 90 - 180 | 135 - 270 | 200 - 400 | 300 - 600 |

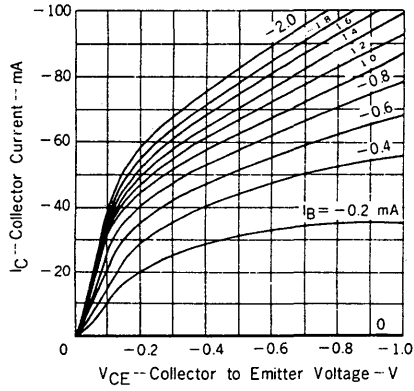
$h_{FE}$  Test Conditions :  $V_{CE} = -6.0$  V,  $I_C = -1.0$  mA

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

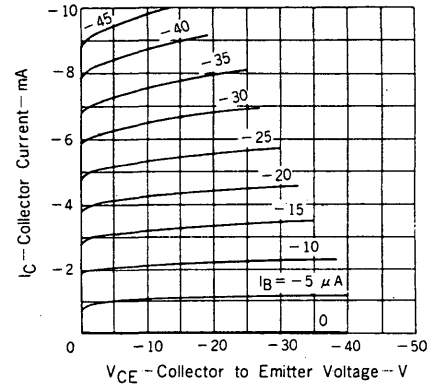
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



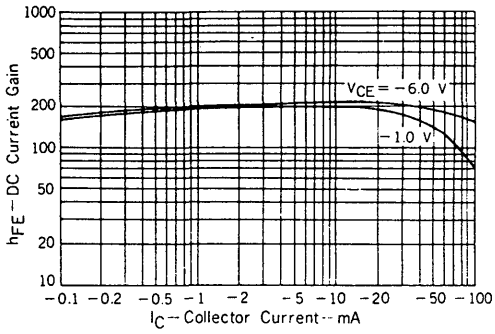
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



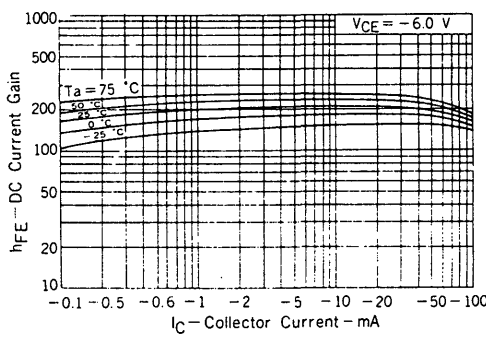
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



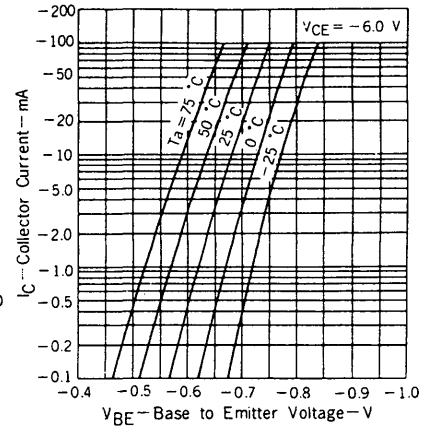
DC CURRENT GAIN vs. COLLECTOR CURRENT



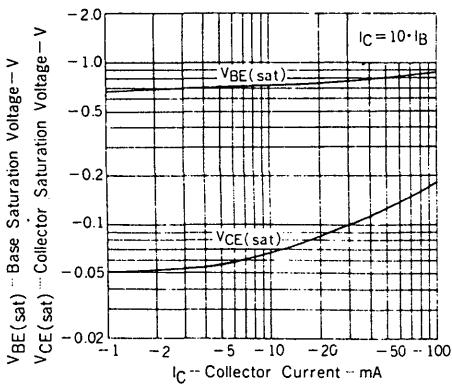
DC CURRENT GAIN vs. COLLECTOR CURRENT



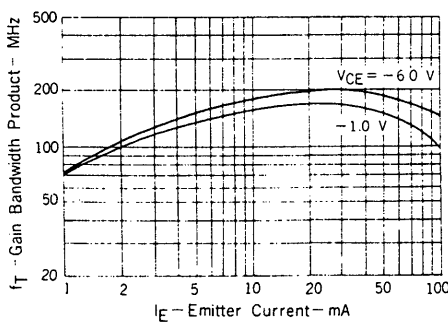
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



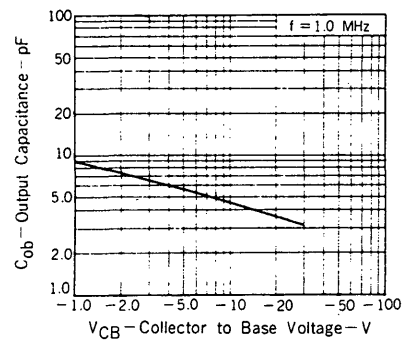
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



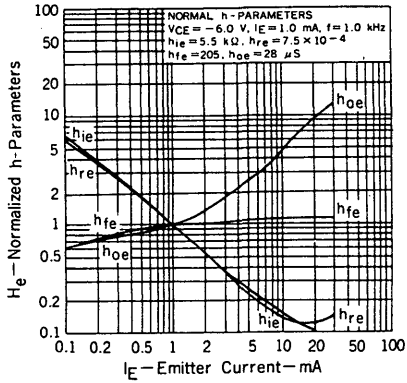
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



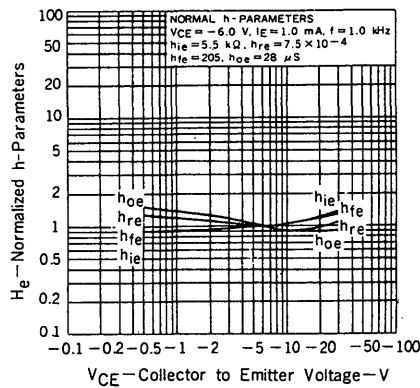
OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



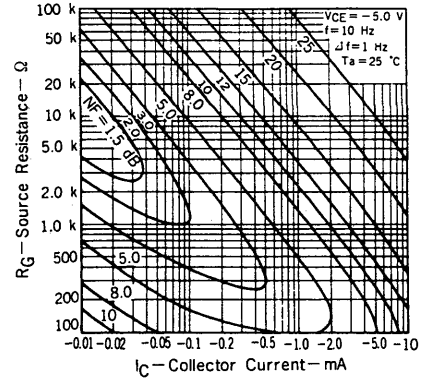
NORMALIZED h-PARAMETERS vs. EMITTER CURRENT



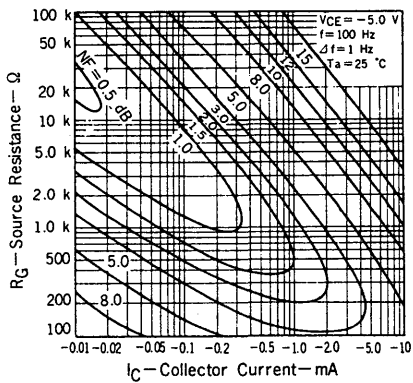
NORMALIZED h-PARAMETERS vs. COLLECTOR TO EMITTER VOLTAGE



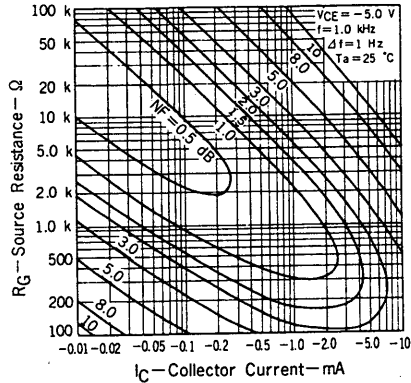
NOISE FIGURE MAP 1



NOISE FIGURE MAP 2



NOISE FIGURE MAP 3



NOISE FIGURE MAP 4

