

**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

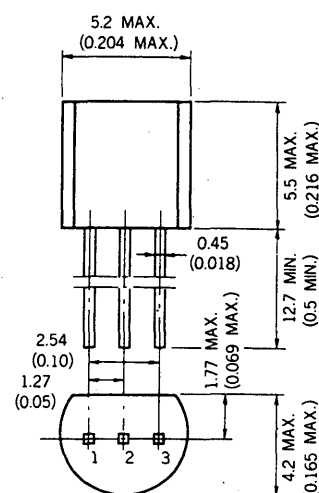
$V_{EBO}$  Emitter to Base Voltage ..... -5.0 V

$I_C$  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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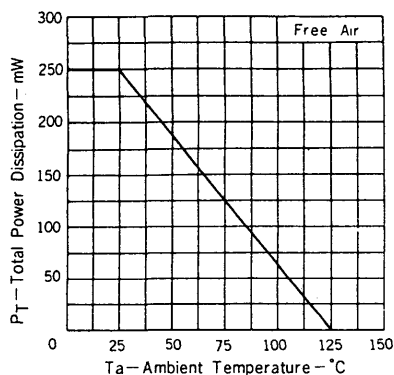
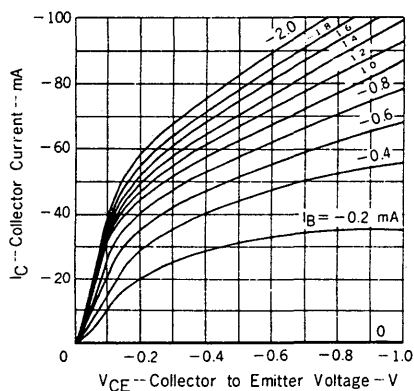
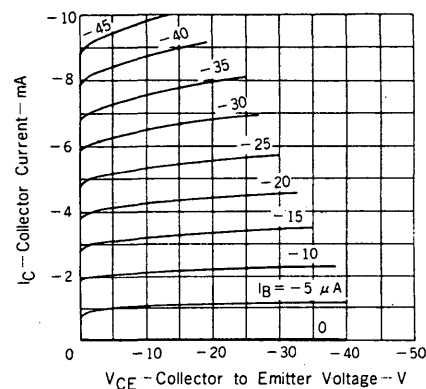
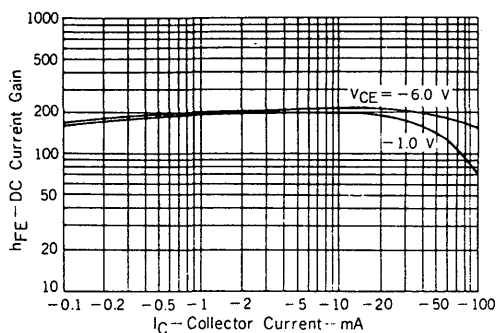
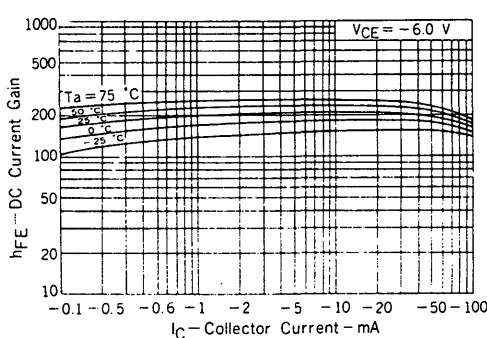
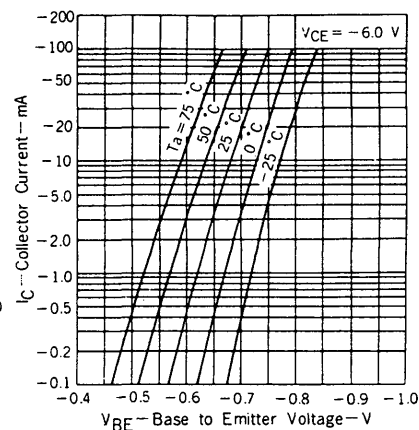
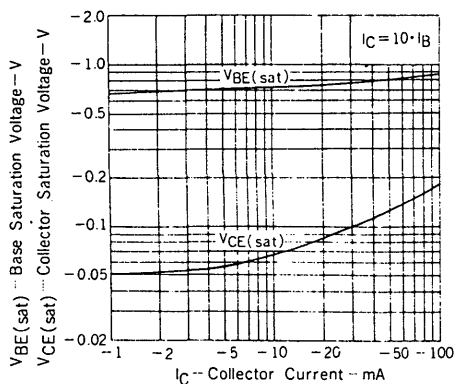
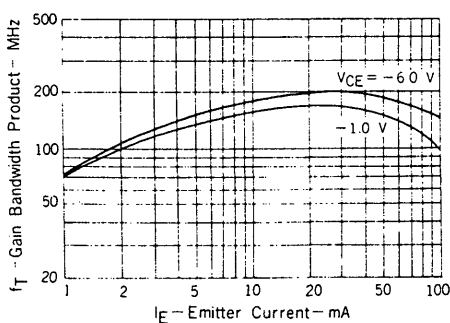
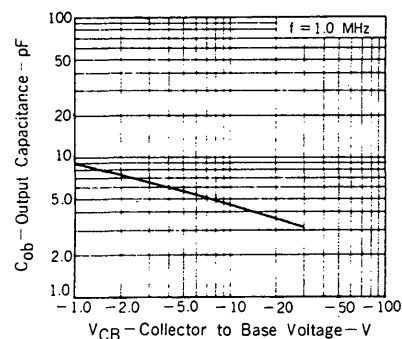
## ELECTRICAL CHARACTERISTICS ( $T_a = 25$ °C)

| 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                                          |

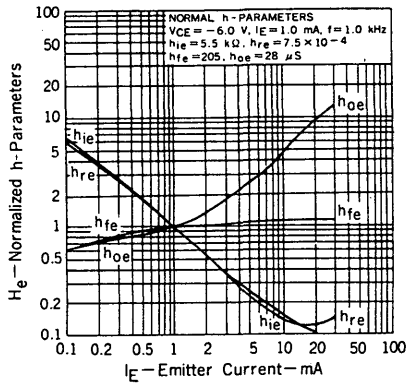
## Classification of $h_{FE}$

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

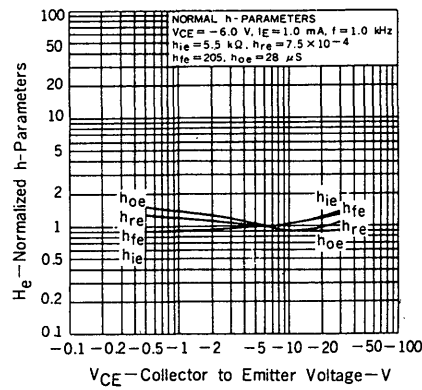
$h_{FE}$  Test Conditions :  $V_{CE} = -6.0$  V,  $I_C = -1.0$  mA

TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$  unless otherwise noted)TOTAL POWER DISSIPATION  
vs. AMBIENT TEMPERATURECOLLECTOR CURRENT vs.  
COLLECTOR TO EMITTER VOLTAGECOLLECTOR CURRENT vs.  
COLLECTOR TO EMITTER VOLTAGEDC CURRENT GAIN  
vs. COLLECTOR CURRENTDC CURRENT GAIN  
vs. COLLECTOR CURRENTCOLLECTOR CURRENT vs.  
BASE TO EMITTER VOLTAGECOLLECTOR AND BASE SATURATION  
VOLTAGE vs. COLLECTOR CURRENTGAIN BANDWIDTH PRODUCT  
vs. EMITTER CURRENTOUTPUT CAPACITANCE  
vs. REVERSE VOLTAGE

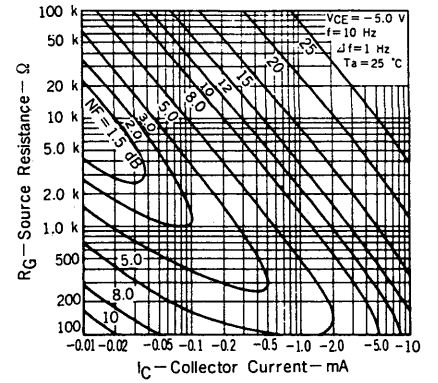
NORMALIZED h-PARAMETERS  
vs. EMITTER CURRENT



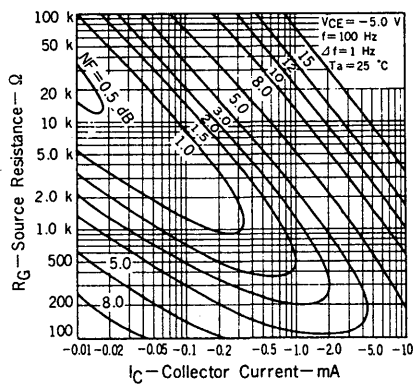
NORMALIZED h-PARAMETERS vs.  
COLLECTOR TO EMITTER VOLTAGE



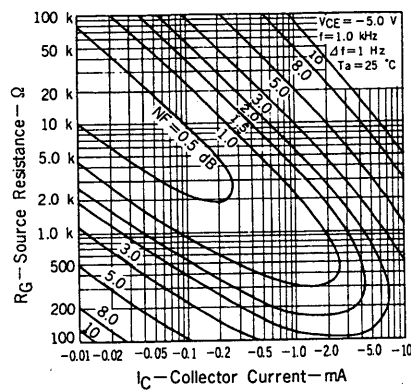
NOISE FIGURE MAP 1



NOISE FIGURE MAP 2



NOISE FIGURE MAP 3



NOISE FIGURE MAP 4

