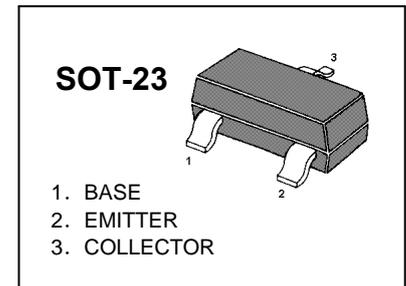


TRANSISTOR (NPN)

FEATURES

AM/FM Amplifier, Local Oscillator of FM/VHF Tuner

High Current Gain Bandwidth Product $f_T=1.1$ GHz (Typ)



MARKING : T33

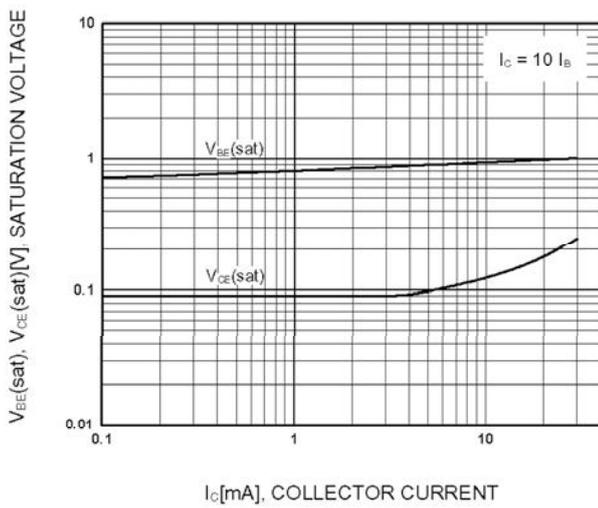
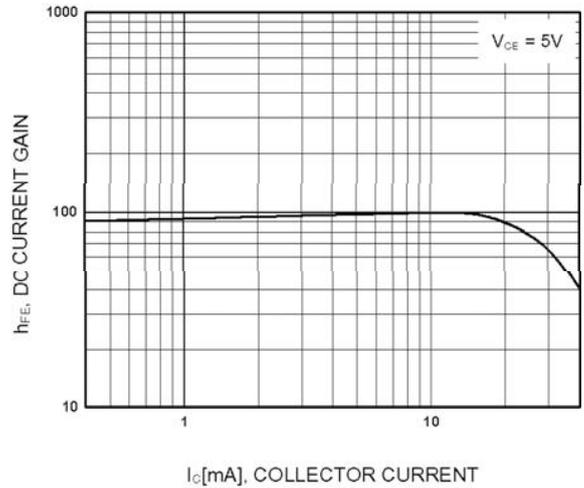
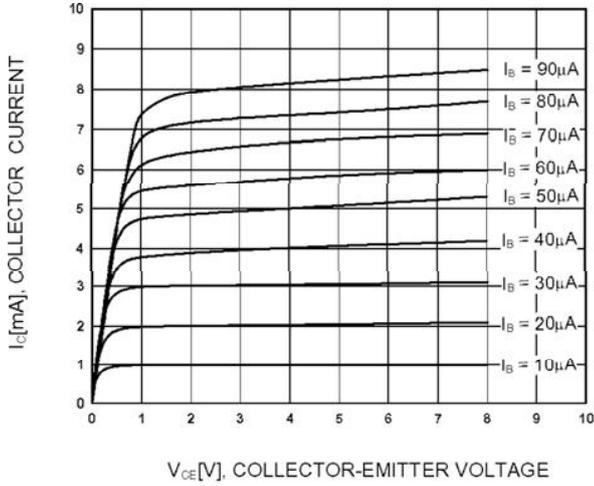
MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Value | Units |
|-----------|-------------------------------|---------|------------------|
| V_{CB0} | Collector-Base Voltage | 30 | V |
| V_{CE0} | Collector-Emitter Voltage | 15 | V |
| V_{EB0} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current -Continuous | 50 | mA |
| P_C | Collector Power Dissipation | 150 | mW |
| T_j | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature | -55-150 | $^\circ\text{C}$ |

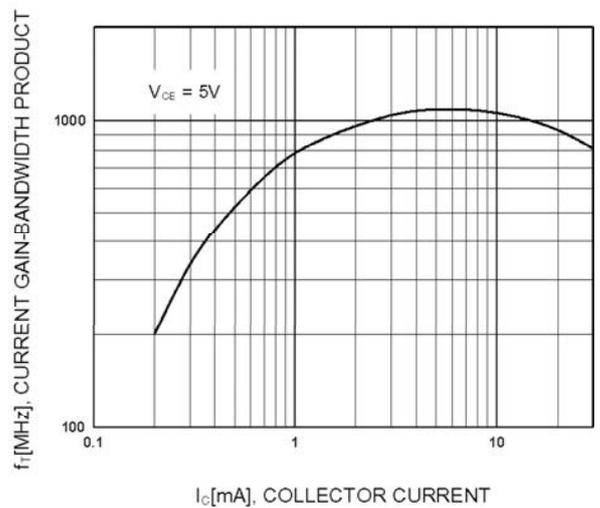
ELECTRICAL CHARACTERISTICS ($T_{amb}=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|--------------------------------------|---------------|--|-----|-----|------|---------------|
| Collector-base breakdown voltage | $V_{(BR)CB0}$ | $I_C=100\mu\text{A}$, $I_E=0$ | 30 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CE0}$ | $I_C=1\text{mA}$, $I_B=0$ | 15 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EB0}$ | $I_E=100\mu\text{A}$, $I_C=0$ | 5 | | | V |
| Collector cut-off current | I_{CB0} | $V_{CB}=12\text{V}$, $I_E=0$ | | | 0.05 | μA |
| Collector cut-off current | I_{CE0} | $V_{CE}=12\text{V}$, $I_B=0$ | | | 0.1 | μA |
| Emitter cut-off current | I_{EB0} | $V_{EB}=3\text{V}$, $I_C=0$ | | | 0.1 | μA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}=5\text{V}$, $I_C=1\text{mA}$ | 105 | | 195 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=10\text{mA}$, $I_B=1\text{mA}$ | | | 0.5 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C=10\text{mA}$, $I_B=1\text{mA}$ | | | 1.4 | V |
| Transition frequency | f_T | $V_{CE}=5\text{V}$, $I_C=5\text{mA}$ $f=400\text{MHz}$ | 600 | | | MHz |

Typical Characteristics



Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

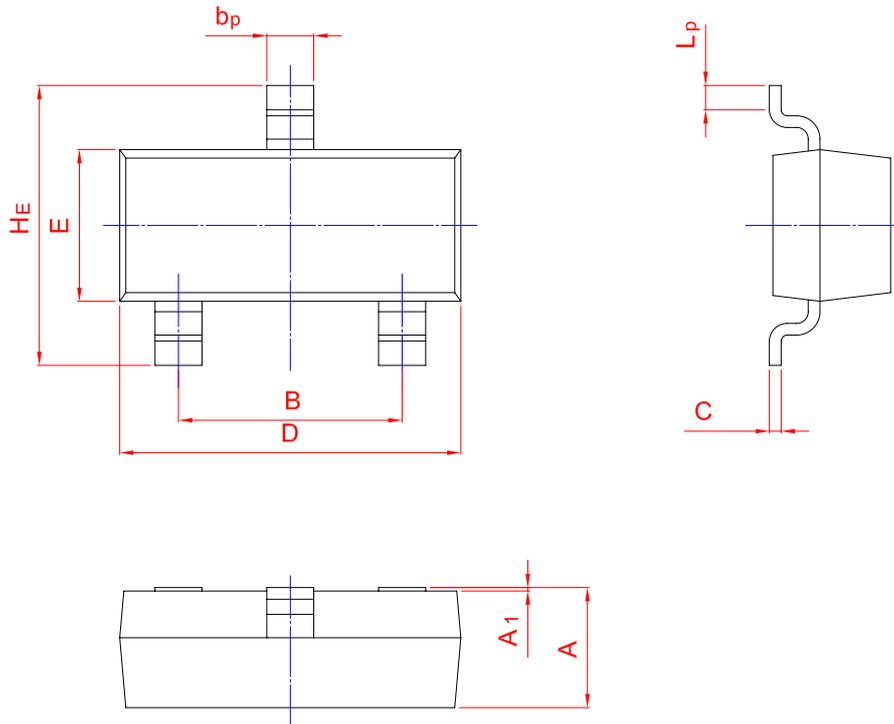


Current Gain Bandwidth Product

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A | B | bp | C | D | E | HE | A1 | Lp |
|------|------|------|------|------|------|------|------|-------|------|
| mm | 1.40 | 2.04 | 0.50 | 0.19 | 3.10 | 1.65 | 3.00 | 0.100 | 0.50 |
| | 0.95 | 1.78 | 0.35 | 0.08 | 2.70 | 1.20 | 2.20 | 0.013 | 0.20 |

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