NEC

DATA SHEET

SILICON TRANSISTOR

# 2SD2583

## AUDIO FREQUENCY AMPLIFIER, SWITCHING
## NOPN SILICON EPITAXIAL TRANSISTORS

### FEATURES

- Low $V_{CE(sat)}$
  $V_{CE(sat)}$ = 0.15 V Max (@$I_C$/$I_B$ = 1.0 A/50 mA)
- High DC Current Gain
  $h_{EF}$ = 150 to 600 (@$V_{CE}$ = 2.0 V, $I_C$ = 1.0 A)

### ABSOLUTE MAXIMUM RATINGS

Maximum Voltage and Current ($T_A$ = 25 °C)

| | | |
|---|---|---|
| Collector to Base Voltage | $V_{CB0}$ | 30 V |
| Collector to Emitter Volteage | $V_{CE0}$ | 30 V |
| Emitter to Base Voltage | $V_{EB0}$ | 6.0 V |
| Collector Current (DC) | $I_{C(DC)}$ | 5.0 A |
| Collector Current (Pulse)* | $I_{C(Pulse)}$ | 10 A |
| Base Current (DC) | $I_{B(DC)}$ | 2.0A |

* PW ≤ 10ms, Duty Cycle ≤ 10 %

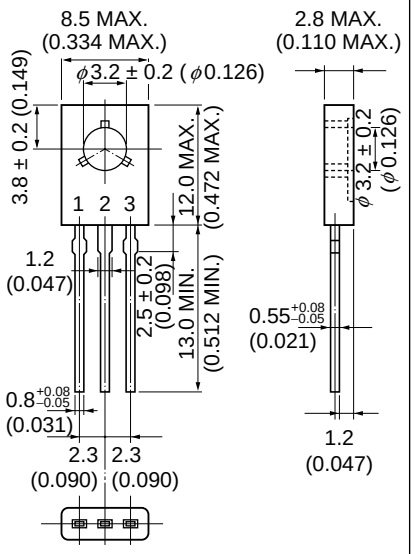
Maximum Power Dissipation

| | | |
|---|---|---|
| Total Power Dissipation ($T_C$ = 25 °C) | $P_T$ | 10 W |
| Total Power Dissipation ($T_A$ = 25 °C) | $P_T$ | 1.0 W |

Maximum Temperature

| | | |
|---|---|---|
| Junction Temperature | $T_j$ | 150 °C |
| Storage Temperature | $T_{stg}$ | –55 to 150 °C |

**PACKAGE DIMENSIONS**
in millimeters (inches)




1. Emitter
2. Collector connected to mounting plane
3. Base

### ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C)

| CHARACTERISTICS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Collector Cutoff Currnet | $I_{CB0}$ | $V_{CB}$ = 30 V, $I_E$ = 0 | | | 100 | nA |
| Emitter Cutoff Current | $I_{EB0}$ | $V_{EB}$ = 6.0 V, $I_C$ = 0 | | | 100 | nA |
| DC Current Gain | $h_{FE1}$ | $V_{CE}$ = 2.0 V, $I_C$ = 1.0 A | 150 | | 600 | — |
| DC Current Gain | $h_{FE2}$ | $V_{CE}$ = 2.0 V, $I_C$ = 4.0 A | 50 | | | — |
| Collector Saturation Voltage | $V_{CE(sat)1}$ | $I_C$ = 1.0 A, $I_B$ = 50 mA | | 0.07 | 0.15 | V |
| Collector Saturation Voltage | $V_{CE(sat)2}$ | $I_C$ = 2.0 A, $I_B$ = 0.1 A | | 0.13 | 0.25 | V |
| Collector Saturation Voltage | $V_{CE(sat)3}$ | $I_C$ = 4.0 A, $I_B$ = 0.2 A | | 0.24 | 0.50 | V |
| Base Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 2.0 A, $I_B$ = 0.1 A | | 0.86 | 1.50 | V |
| Gain Bandwidth Product | $f_T$ | $V_{CE}$ = 10 V, $I_E$ = 50 mA | | 120 | | MHz |
| Output Capacitance | $C_{ob}$ | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1 MHz | | 77 | | pF |



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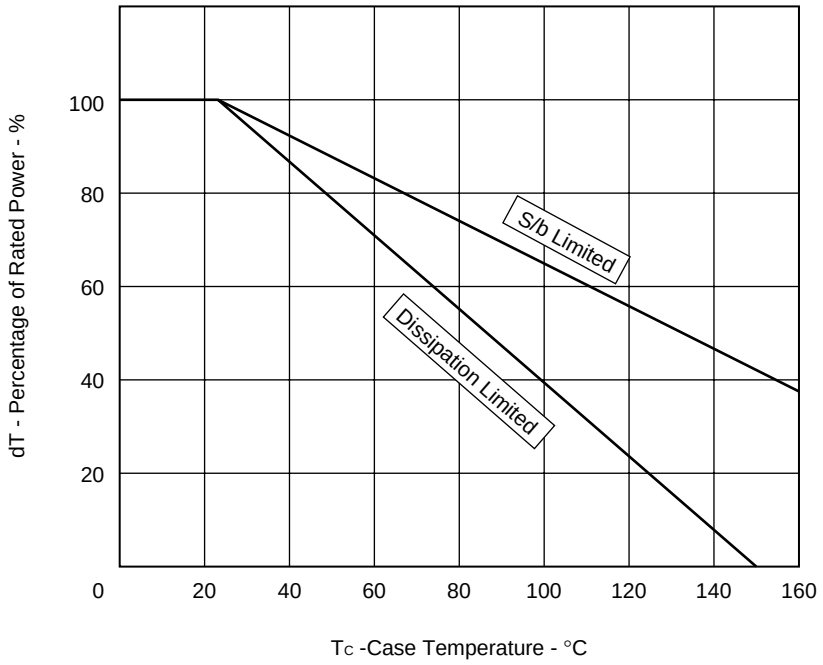
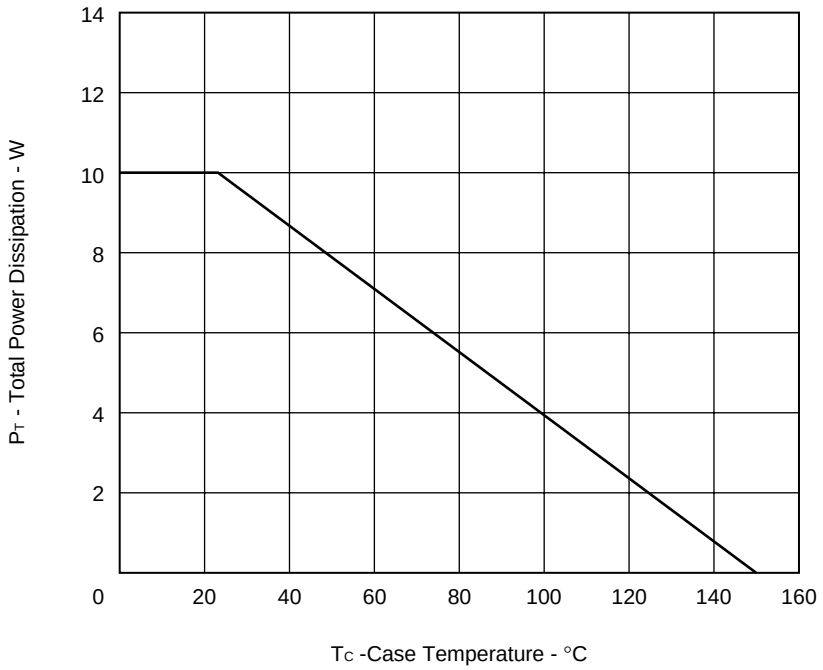
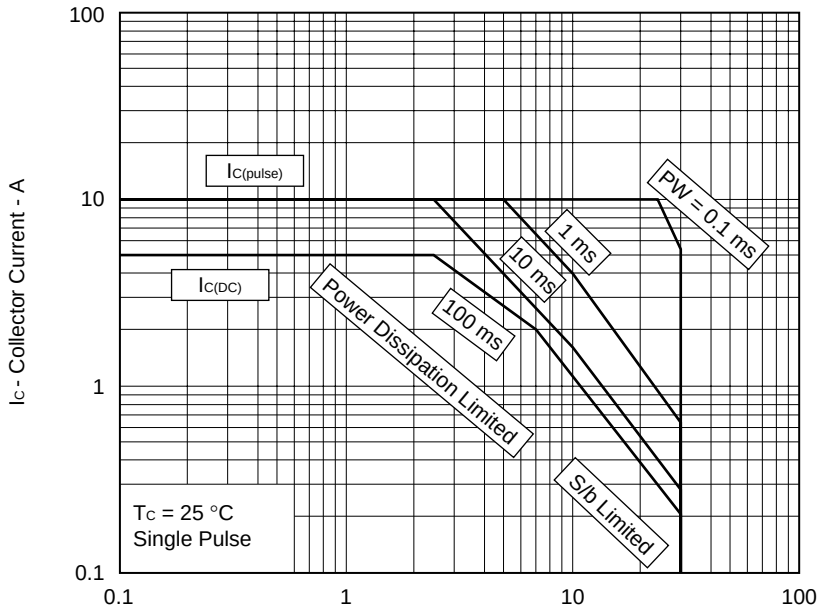
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



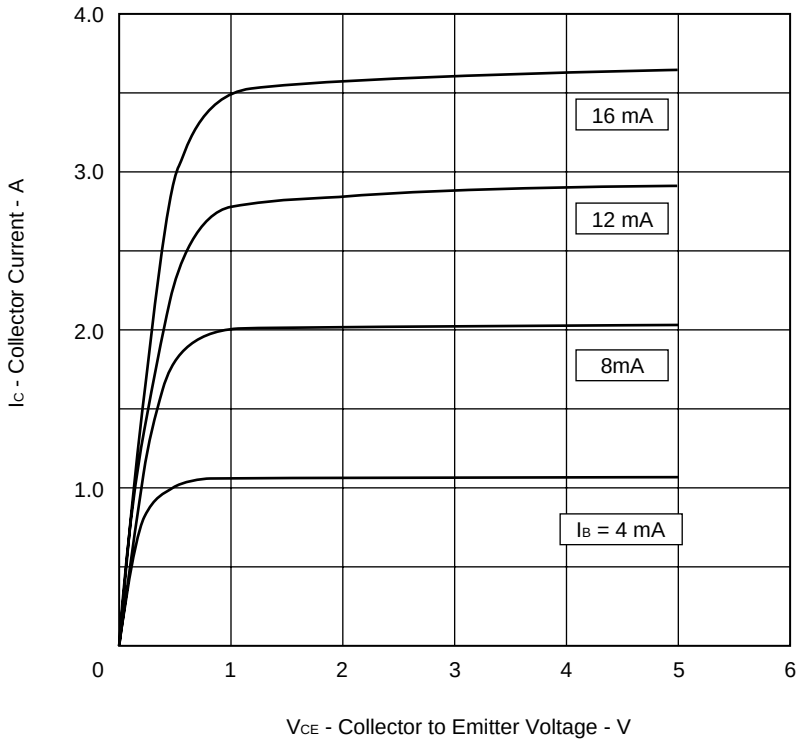

TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



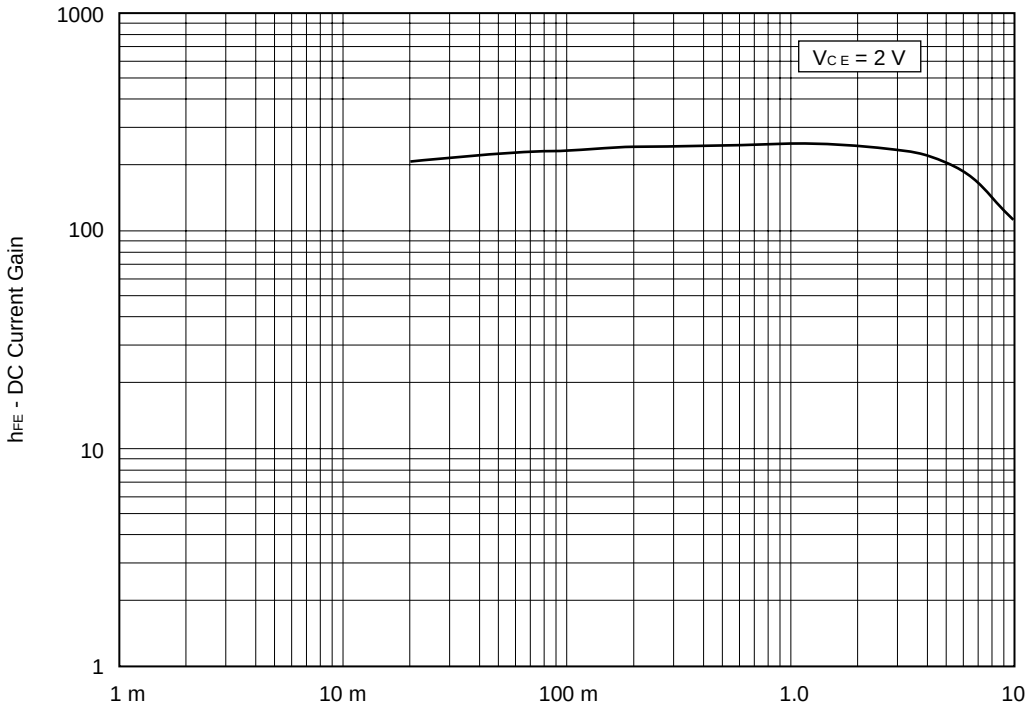
FORWARD BIAS SAFE OPERATING AREA



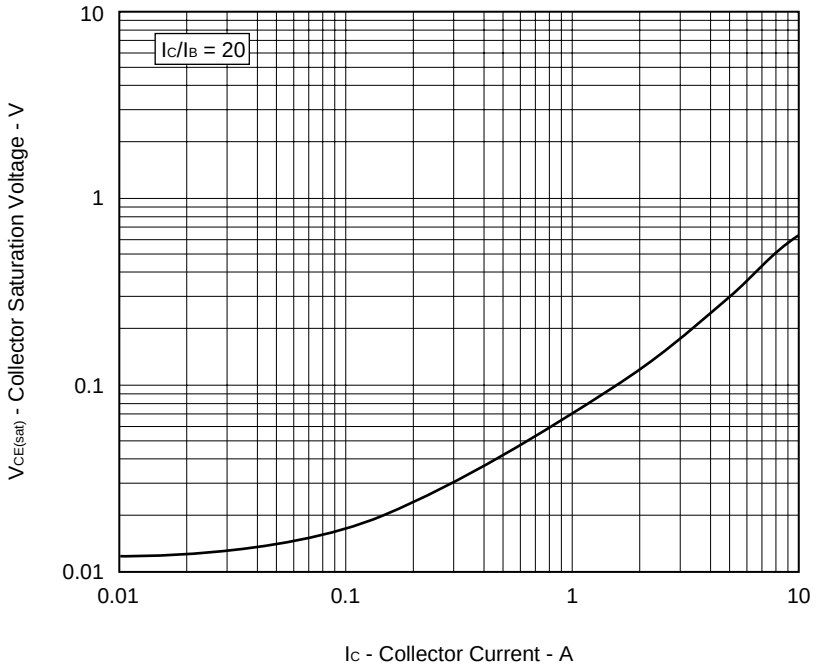
Collector to Emitter Voltage vs Collector Current



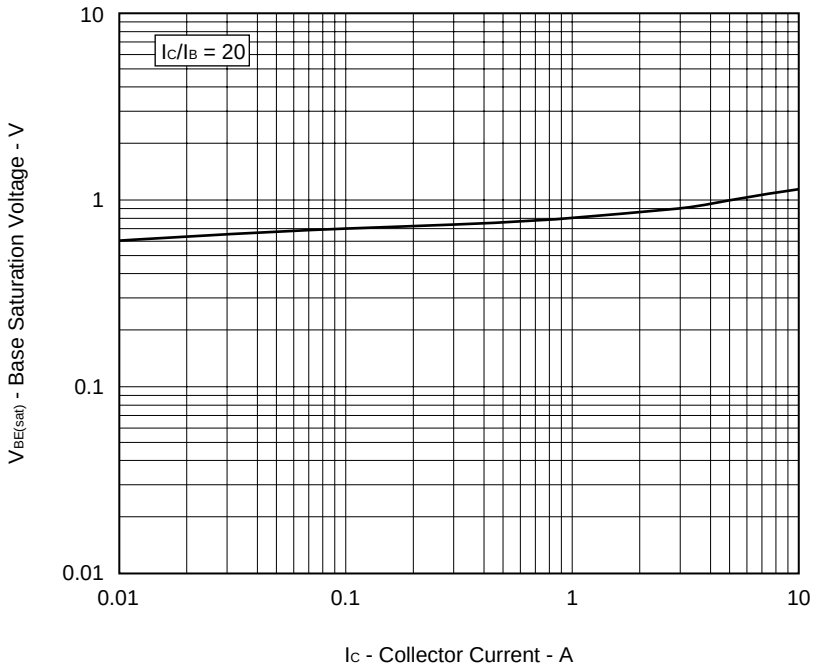

DC Current Gain vs Collector Current



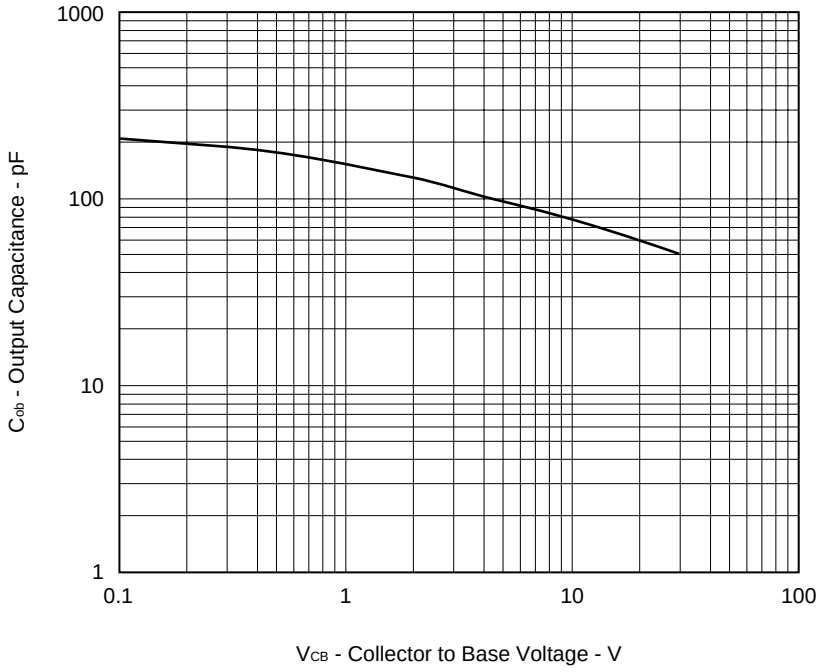
COLLECTOR SATURATION VOLTAGE vs COLLECTOR CURRENT




BASE SATURATION VOLTAGE vs COLLECTOR CURRENT



OUTPUT CAPACITANCE vs COLLECTOR TO BASE VOLTAGE



## REFERENCE

| Document Name | Document No. |
|---|---|
| NEC semiconductor device reliability/quality control system | TEI-1202 |
| Quality grade on NEC semiconductor devices | IEI-1209 |
| Semiconductor device mounting technology manual | C10535E |
| Semiconductor device package manual | C10943X |
| Guide to quality assurance for semiconductor devices | MEI-1202 |
| Semiconductor selection guide | X10679E |

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