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# 2SC1907

Silicon NPN Epitaxial Planar

# HITACHI

ADE-208-1059 (Z)  
1st. Edition  
Mar. 2001

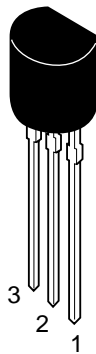
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## Application

UHF TV Tuner, Local oscillator

## Outline

TO-92 (2)



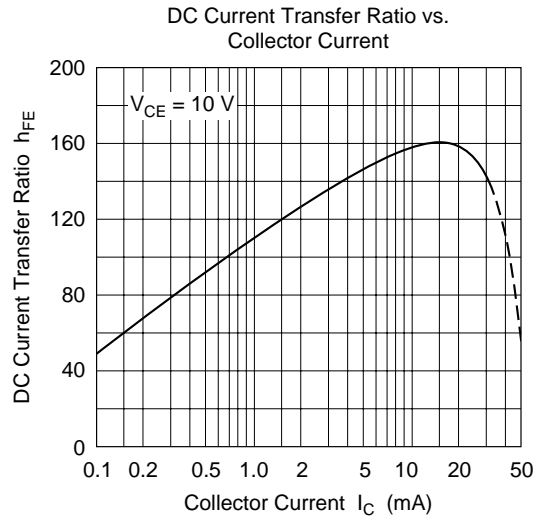
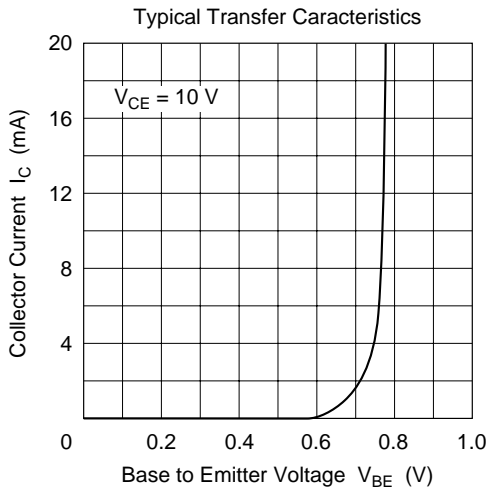
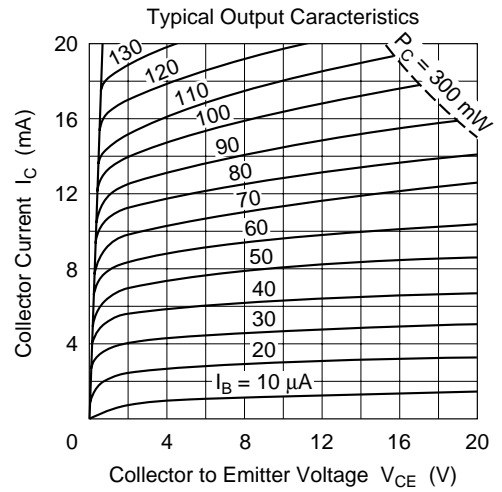
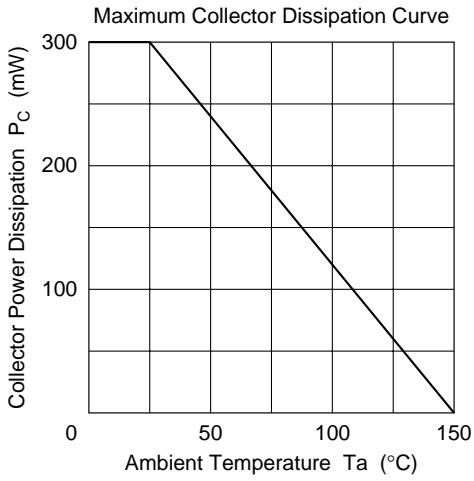
1. Emitter
2. Collector
3. Base

**Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

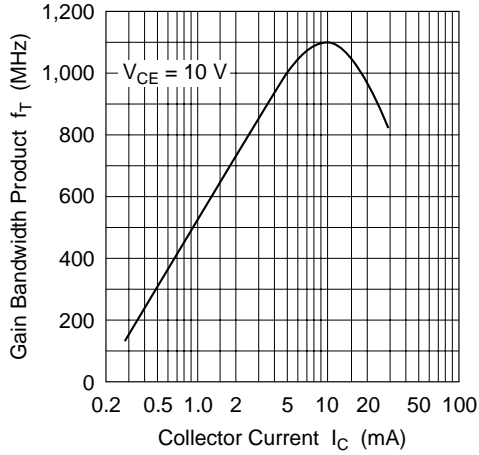
| Item                         | Symbol           | Ratings     | Unit             |
|------------------------------|------------------|-------------|------------------|
| Collector to base voltage    | $V_{\text{CBO}}$ | 30          | V                |
| Collector to emitter voltage | $V_{\text{CEO}}$ | 19          | V                |
| Emitter to base voltage      | $V_{\text{EBO}}$ | 2           | V                |
| Collector current            | $I_{\text{C}}$   | 50          | mA               |
| Emitter current              | $I_{\text{E}}$   | -50         | mA               |
| Collector power dissipation  | $P_{\text{C}}$   | 300         | mW               |
| Junction temperature         | $T_{\text{j}}$   | 150         | $^\circ\text{C}$ |
| Storage temperature          | $T_{\text{stg}}$ | -55 to +150 | $^\circ\text{C}$ |

**Electrical Characteristics** ( $T_a = 25^\circ\text{C}$ )

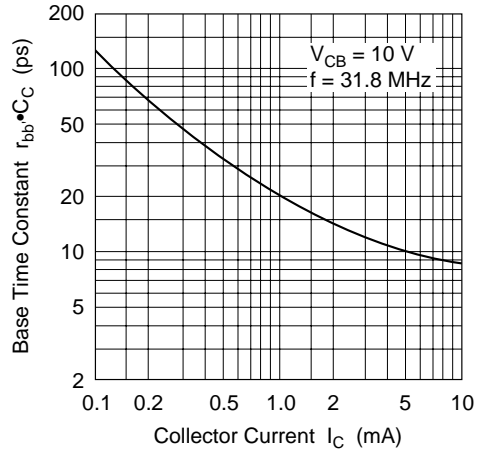
| Item                                    | Symbol                              | Min | Typ  | Max | Unit          | Test conditions   |
|---|-------------------------------------|-----|------|-----|---------------|---|
| Collector to base breakdown voltage     | $V_{(\text{BR})\text{CBO}}$         | 30  | —    | —   | V             | $I_{\text{C}} = 10 \mu\text{A}$ , $I_{\text{E}} = 0$  |
| Collector to emitter breakdown voltage  | $V_{(\text{BR})\text{CEO}}$         | 19  | —    | —   | V             | $I_{\text{C}} = 3 \text{ mA}$ , $R_{\text{BE}} = \infty$                                    |
| Emitter to base breakdown voltage       | $V_{(\text{BR})\text{EBO}}$         | 2   | —    | —   | V             | $I_{\text{E}} = 10 \mu\text{A}$ , $I_{\text{C}} = 0$  |
| Collector cutoff current                | $I_{\text{CBO}}$                    | —   | —    | 0.5 | $\mu\text{A}$ | $V_{\text{CB}} = 10 \text{ V}$ , $I_{\text{E}} = 0$   |
| DC current transfer ratio               | $h_{\text{FE}}$                     | 40  | —    | —   |               | $V_{\text{CE}} = 10 \text{ V}$ , $I_{\text{C}} = 10 \text{ mA}$                             |
| Collector to emitter saturation voltage | $V_{\text{CE}(\text{sat})}$         | —   | 0.2  | 1.0 | V             | $I_{\text{C}} = 20 \text{ mA}$ , $I_{\text{B}} = 4 \text{ mA}$                              |
| Collector output capacitance            | $C_{\text{ob}}$                     | —   | 1.0  | 2.0 | pF            | $V_{\text{CB}} = 10 \text{ V}$ , $I_{\text{E}} = 0$ , $f = 1 \text{ MHz}$                   |
| Gain bandwidth product                  | $f_{\text{T}}$                      | 900 | 1100 | —   | MHz           | $V_{\text{CE}} = 10 \text{ V}$ , $I_{\text{C}} = 10 \text{ mA}$                             |
| Base time constant                      | $r_{\text{bb}'} \cdot C_{\text{C}}$ | —   | 10   | 25  | ps            | $V_{\text{CB}} = 10 \text{ V}$ , $I_{\text{C}} = 10 \text{ mA}$ ,<br>$f = 31.8 \text{ MHz}$ |
| Oscillation output power                | $P_{\text{out}}$                    | —   | 8    | —   | mW            | $V_{\text{CB}} = 10 \text{ V}$ , $I_{\text{C}} = 10 \text{ mA}$ ,<br>$f = 930 \text{ MHz}$  |



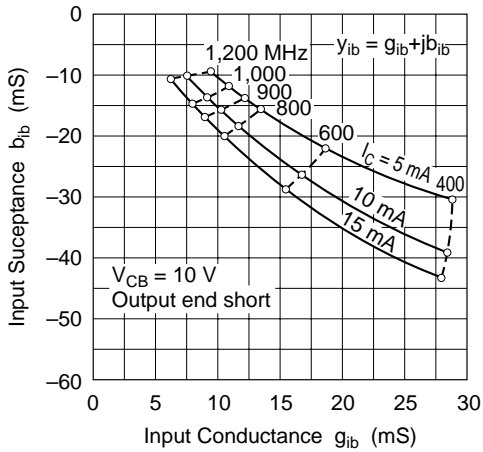
Gain Bandwidth Product vs. Collector Current



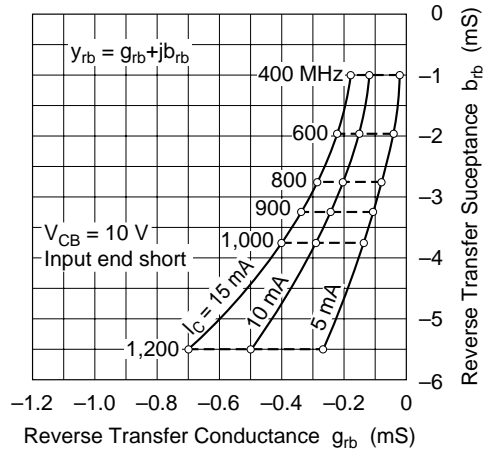
Base Time Constant vs. Collector Current



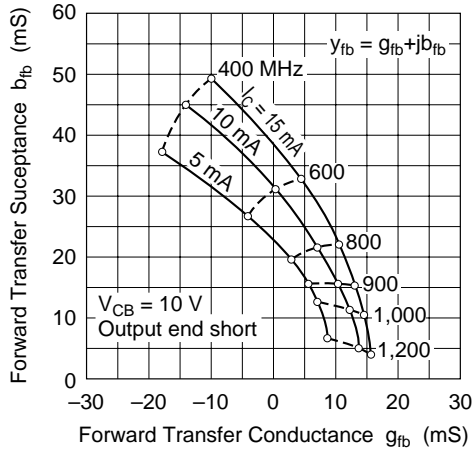
Input Admittance Characteristics



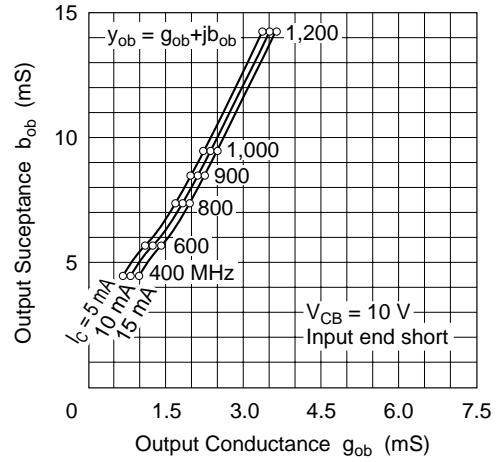
Reverse Transfer Admittance Characteristics



Forward Transfer Admittance Characteristics

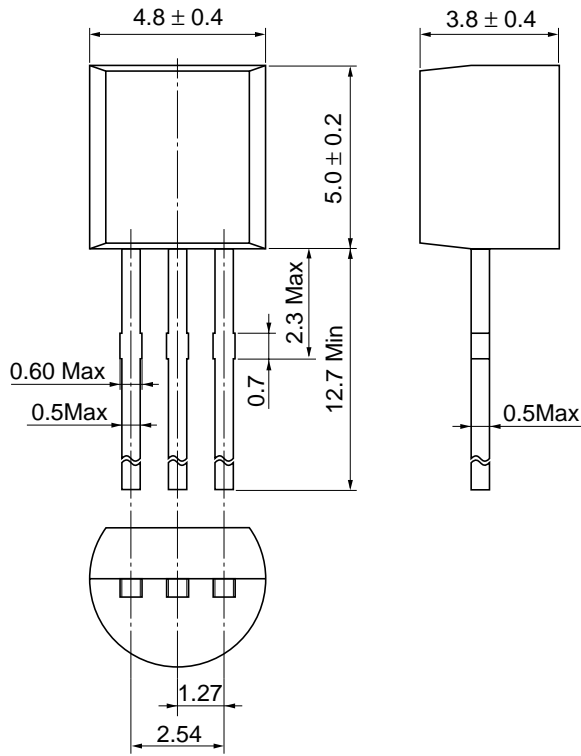


Output Admittance Characteristics



Package Dimensions

As of January, 2001  
Unit: mm



|                        |           |
|------------------------|-----------|
| Hitachi Code           | TO-92 (2) |
| JEDEC                  | Conforms  |
| EIAJ                   | Conforms  |
| Mass (reference value) | 0.25 g    |

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