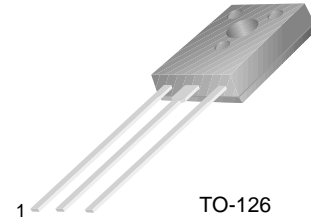


## MJE170/171/172

**Low Power Audio Amplifier**  
**Low Current, High Speed Switching Applications**



TO-126  
1. Emitter 2. Collector 3. Base

### PNP Epitaxial Silicon Transistor

**Absolute Maximum Ratings**  $T_C=25^\circ\text{C}$  unless otherwise noted

| Symbol    | Parameter  | Value      | Units            |
|-----------|--|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                           | : MJE170   | - 60             |
|           |  | : MJE171   | - 80             |
|           |  | : MJE172   | - 100            |
| $V_{CEO}$ | Collector-Emitter Voltage                        | : MJE170   | - 40             |
|           |  | : MJE171   | - 60             |
|           |  | : MJE172   | - 80             |
| $V_{EBO}$ | Emitter-Base Voltage                             | - 7        | V                |
| $I_C$     | Collector Current (DC)                           | - 3        | A                |
| $I_{CP}$  | Collector Current (Pulse)                        | - 6        | A                |
| $I_B$     | Base Current                                     | - 1        | A                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 12.5       | W                |
|           | Collector Dissipation ( $T_a=25^\circ\text{C}$ ) | 1.5        | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 65 ~ 150 | $^\circ\text{C}$ |

**Electrical Characteristics**  $T_C=25^\circ\text{C}$  unless otherwise noted

| Symbol        | Parameter  | Test Condition                                     | Min.  | Max. | Units         |
|---------------|--|--|---|------|---------------|
| $BV_{CEO}$    | Collector-Emitter Breakdown Voltage                        | $I_C = 10\text{mA}, I_B = 0$                       | : MJE170  | -40  | V             |
|               |  |  | : MJE171  | -60  | V             |
|               |  |  | : MJE172  | -80  | V             |
| $I_{CBO}$     | Collector Cut-off Current                                  | : MJE170   | $V_{CB} = -60\text{V}, I_B = 0$                           | -0.1 | $\mu\text{A}$ |
|               |  | : MJE171   | $V_{CB} = -80\text{V}, I_E = 0$                           | -0.1 | $\mu\text{A}$ |
|               |  | : MJE172   | $V_{CB} = -100\text{V}, I_E = 0$                          | -0.1 | $\mu\text{A}$ |
|               |  | : MJE170   | $V_{CB} = -60\text{V}, I_E = 0, @T_C = 150^\circ\text{C}$ | -0.1 | mA            |
|               |  | : MJE171   | $V_{CB} = -80\text{V}, I_E = 0, @T_C = 150^\circ\text{C}$ | -0.1 | mA            |
| : MJE172      | $V_{CB} = -100\text{V}, I_E = 0, @T_C = 150^\circ\text{C}$ | -0.1   | mA  |      |               |
| $I_{EBO}$     | Emitter Cut-off Current                                    | $V_{BE} = -7\text{V}, I_C = 0$                     |   | -0.1 | $\mu\text{A}$ |
| $h_{FE}$      | DC Current Gain  | $V_{CE} = -1\text{V}, I_C = -100\text{mA}$         | 50  | 250  |               |
|               |  | $V_{CE} = -1\text{V}, I_C = -500\text{mA}$         | 30  |      |               |
|               |  | $V_{CE} = -1\text{V}, I_C = -1.5\text{A}$          | 12  |      |               |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage                       | $I_C = -500\text{mA}, I_B = -50\text{mA}$          |   | -0.3 | V             |
|               |  | $I_C = -1.5\text{A}, I_B = -150\text{mA}$          |   | -0.9 | V             |
|               |  | $I_C = -3\text{A}, I_B = -600\text{mA}$            |   | -1.7 | V             |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage                            | $I_C = -1.5\text{A}, I_B = -150\text{mA}$          |   | -1.5 | V             |
|               |  | $I_C = -3\text{A}, I_B = -600\text{mA}$            |   | -2.0 | V             |
| $V_{BE(on)}$  | Base-Emitter ON Voltage                                    | $V_{CE} = -1\text{V}, I_C = -500\text{mA}$         |   | -1.2 | V             |
| $f_T$         | Current Gain Bandwidth Product                             | $V_{CE} = -10\text{V}, I_C = -100\text{mA}$        | 50  |      | MHz           |
| $C_{ob}$      | Output Capacitance   | $V_{CB} = -10\text{V}, I_E = 0, f = 0.1\text{MHz}$ |   | 50   | pF            |

# Typical Characteristics

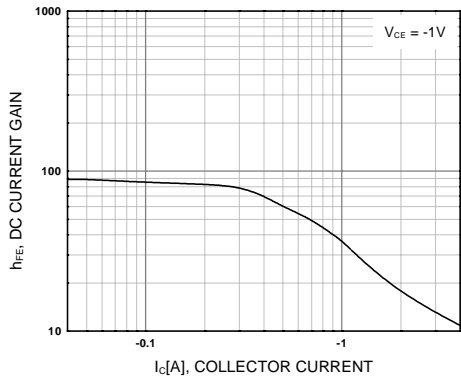


Figure 1. DC current Gain

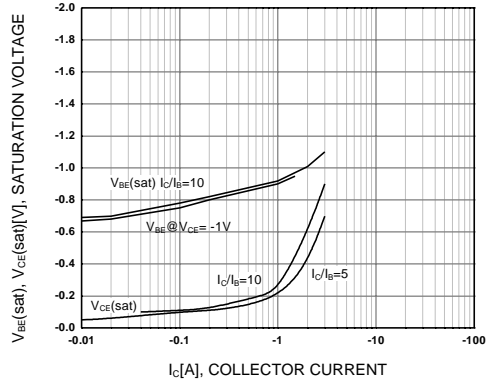


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

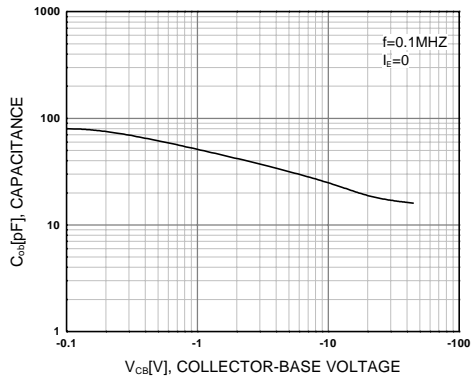


Figure 3. Collector Output Capacitance

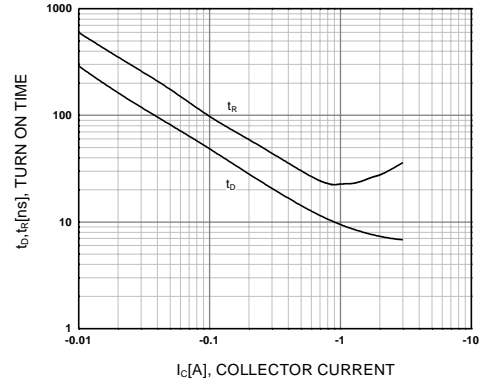


Figure 4. Turn On Time

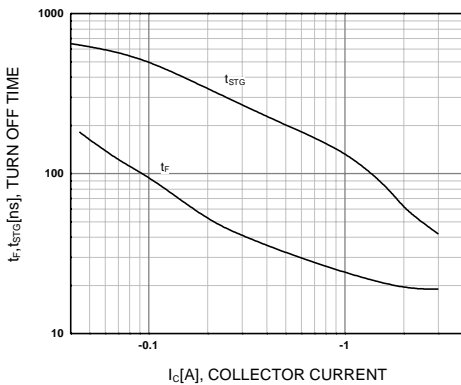


Figure 5. Turn Off Time

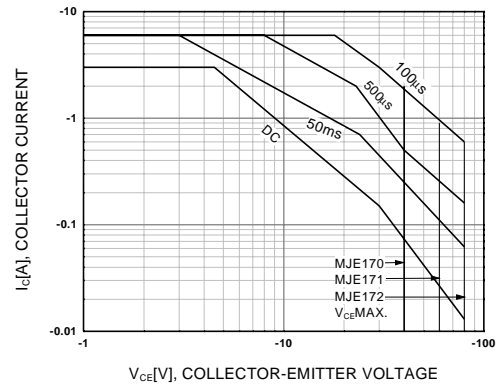


Figure 6. Safe Operating Area

### Typical Characteristics (Continued)

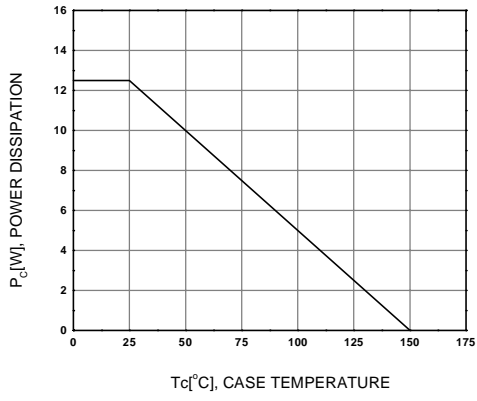


Figure 7. DC current Gain

# Package Dimensions

## TO-126

MJE170/171/172



Dimensions in Millimeters

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| E <sup>2</sup> CMOS™ | LittleFET™          | QT Optoelectronics™ | TinyLogic™      |
| EnSigna™             | MicroFET™           | Quiet Series™       | UHC™            |
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