

## NTE296 Silicon PNP Transistor General Purpose Amplifier

**Description:**

The NTE296 is a silicon PNP transistor in a TO202 type case designed for general purpose applications requiring high breakdown voltages, low saturation voltages and low capacitance.

**Absolute Maximum Ratings:**

|  |                                     |
|--|-------------------------------------|
| Collector–Emitter Voltage, $V_{CEO}$ .....                         | 300V                                |
| Collector–Base Voltage, $V_{CB}$ .....                             | 300V                                |
| Emitter–Base Voltage, $V_{EB}$ .....                               | 5V                                  |
| Continuous Collector Current, $I_C$ .....                          | 500mA                               |
| Total Power Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ ..... | 2W                                  |
| Derate Above $25^\circ\text{C}$ .....                              | 16mW/ $^\circ\text{C}$              |
| Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ ..... | 10W                                 |
| Derate Above $25^\circ\text{C}$ .....                              | 80mW/ $^\circ\text{C}$              |
| Operating Junction Temperature Range, $T_J$ .....                  | $-55^\circ$ to $+150^\circ\text{C}$ |
| Storage Temperature Range, $T_{stg}$ .....                         | $-55^\circ$ to $+150^\circ\text{C}$ |
| Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....          | 62.5 $^\circ\text{C}/\text{W}$      |
| Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....             | 12.5 $^\circ\text{C}/\text{W}$      |

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

| Parameter                           | Symbol        | Test Conditions                      | Min | Typ | Max | Unit          |
|-------------------------------------|---------------|--------------------------------------|-----|-----|-----|---------------|
| <b>OFF Characteristics</b>          |               |                                      |     |     |     |               |
| Collector–Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 1\text{mA}, I_B = 0$ , Note 1 | 300 | –   | –   | V             |
| Collector–Base Breakdown Voltage    | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}, I_E = 0$      | 300 | –   | –   | V             |
| Emitter–Base Breakdown Voltage      | $V_{(BR)EBO}$ | $I_E = 10\mu\text{A}, I_C = 0$       | 5   | –   | –   | V             |
| Collector Cutoff Current            | $I_{CBO}$     | $V_{CB} = 200\text{V}, I_E = 0$      | –   | –   | 0.2 | $\mu\text{A}$ |
| Emitter Cutoff Current              | $I_{EBO}$     | $V_{BE} = 3\text{V}, I_C = 0$        | –   | –   | 0.1 | $\mu\text{A}$ |

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

| Parameter                            | Symbol        | Test Conditions  | Min | Typ | Max  | Unit |
|--------------------------------------|---------------|--|-----|-----|------|------|
| <b>ON Characteristics</b>            |               |  |     |     |      |      |
| DC Current Gain                      | $h_{FE}$      | $I_C = 1\text{mA}, V_{CE} = 10\text{V}$                    | 25  | -   | -    |      |
|                                      |               | $I_C = 10\text{mA}, V_{CE} = 10\text{V}$                   | 30  | -   | -    |      |
|                                      |               | $I_C = 30\text{mA}, V_{CE} = 10\text{V}$                   | 30  | -   | -    |      |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 30\text{mA}, I_B = 3\text{mA}$                      | -   | -   | 0.75 | V    |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 30\text{mA}, I_B = 3\text{mA}$                      | -   | -   | 0.9  | V    |
| <b>Dynamic Characteristics</b>       |               |  |     |     |      |      |
| Current Gain-Bandwidth Product       | $f_T$         | $I_C = 10\text{mA}, V_{CE} = 20\text{V}, f = 10\text{MHz}$ | 45  | -   | -    | MHz  |
| Collector-Base Capacitance           | $C_{cb}$      | $V_{CB} = 20\text{V}, I_E = 0, f = 1\text{MHz}$            | -   | -   | 8    | pF   |

Note 1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

