

## NTE105 Germanium PNP Transistor Audio Power Amp

**Description:**

The NTE105 is a germanium PNP power transistor in a TO36 type package designed for use in power switching and amplifier applications.

**Absolute Maximum Ratings:**

|   |                                     |
|---|-------------------------------------|
| Collector–Emitter Voltage, $V_{CES}$ .....                          | 40V                                 |
| Collector–Base Voltage, $V_{CB}$ .....                              | 40V                                 |
| Emitter–Base Voltage, $V_{EB}$ .....                                | 20V                                 |
| Continuous Base Current, $I_B$ .....                                | 4A                                  |
| Continuous Emitter Current, $I_E$ .....                             | 15A                                 |
| Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ ..... | 150W                                |
| Operating Junction Temperature Range, $T_J$ .....                   | $-65^\circ$ to $+100^\circ\text{C}$ |
| Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....              | $0.5^\circ\text{C/W}$               |

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

| Parameter                            | Symbol        | Test Conditions                                  | Min | Typ  | Max | Unit |
|--------------------------------------|---------------|--|-----|------|-----|------|
| <b>OFF Characteristics</b>           |               |  |     |      |     |      |
| Collector–Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C = 1A, I_B = 0$ , Note 1                     | 25  | –    | –   | V    |
|                                      | $V_{(BR)CES}$ | $I_C = 300\text{mA}, V_{BE} = 0$ , Note 1        | 40  | –    | –   | V    |
| Floating Potential                   | $V_{EBF}$     | $V_{CB} = 40V, I_E = 0$                          | –   | –    | 1.0 | V    |
| Collector Cutoff Current             | $I_{CBO}$     | $V_{CB} = 2V, I_E = 0$                           | –   | 0.1  | –   | mA   |
|                                      |               | $V_{CB} = 40V, I_E = 0$                          | –   | 2.0  | 8.0 | mA   |
|                                      |               | $V_{CB} = 40V, I_E = 0, T_B = +71^\circ\text{C}$ | –   | –    | 15  | mA   |
| Emitter Cutoff Current               | $I_{EBO}$     | $V_{BE} = 20V, I_C = 0$                          | –   | 1.0  | 8.0 | mA   |
| <b>ON Characteristics</b>            |               |  |     |      |     |      |
| DC Current Gain                      | $h_{FE}$      | $V_{CE} = 2V, I_C = 5A$                          | 20  | –    | 40  |      |
|                                      |               | $V_{CE} = 2V, I_C = 12A$                         | –   | 20   | –   |      |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 12A, I_B = 2A$                            | –   | 0.3  | –   | V    |
| Base–Emitter Voltage                 | $V_{BE}$      | $V_{CE} = 2V, I_C = 5A$                          | –   | 0.65 | –   | V    |

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

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

| Parameter                        | Symbol         | Test Conditions                           | Min | Typ | Max | Unit          |
|----------------------------------|----------------|---|-----|-----|-----|---------------|
| <b>Dynamic Characteristics</b>   |                |   |     |     |     |               |
| Common-Emitter Cutoff Frequency  | $f_{\alpha e}$ | $V_{CE} = 6V, I_C = 5A$                   | –   | 10  | –   | kHz           |
| <b>Switching Characteristics</b> |                |   |     |     |     |               |
| Rise Time                        | $t_r$          | $V_{CE} = 12V, I_C = 12A, I_B = 2A$       | –   | 15  | –   | $\mu\text{s}$ |
| Fall Time                        | $t_f$          | $V_{BE} = 6V, I_C = 0, R_{BE} = 10\Omega$ | –   | 15  | –   | $\mu\text{s}$ |

