

## NTE213 Germanium PNP Transistor High Power, High Gain Amplifier

**Description:**

The NTE213 is a germanium PNP power transistor in a TO36 type package designed high-power, high-gain applications in high-reliability industrial equipment.

**Absolute Maximum Ratings:**

|   |                                     |
|---|-------------------------------------|
| Collector-Emitter Voltage, $V_{CEO}$ .....                          | 60V                                 |
| Collector-Emitter Voltage, $V_{CES}$ .....                          | 75V                                 |
| Collector-Base Voltage, $V_{CB}$ .....                              | 75V                                 |
| Emitter-Base Voltage, $V_{EB}$ .....                                | 40V                                 |
| Collector Current, $I_C$ .....                                      | 30A                                 |
| Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ ..... | 170W                                |
| Derate Above $25^\circ\text{C}$ .....                               | 0.5W/ $^\circ\text{C}$              |
| Operating Junction Temperature Range, $T_J$ .....                   | $-65^\circ$ to $+110^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....              | 0.5 $^\circ\text{C}/\text{W}$       |

**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 | $V_{(BR)CEO}$ | $I_C = 1\text{A}, I_B = 0$ , Note 1                     | 60  | –   | –   | V    |
|                                     | $V_{(BR)CES}$ | $I_C = 300\text{mA}, V_{BE} = 0$ , Note 1               | 75  | –   | –   | V    |
| Floating Potential                  | $V_{EBF}$     | $V_{CB} = 75\text{V}, I_E = 0$                          | –   | –   | 1.0 | V    |
| Collector Cutoff Current            | $I_{CBO}$     | $V_{CB} = 2\text{V}, I_E = 0$                           | –   | 0.8 | 0.2 | mA   |
|                                     |               | $V_{CB} = 74\text{V}, I_E = 0$                          | –   | 0.9 | 4.0 | mA   |
|                                     |               | $V_{CB} = 75\text{V}, I_E = 0, T_C = +71^\circ\text{C}$ | –   | 4.0 | 15  | mA   |
| Emitter Cutoff Current              | $I_{EBO}$     | $V_{BE} = 25\text{V}, I_C = 0$                          | –   | 0.2 | 4.0 | mA   |
|                                     |               | $V_{BE} = 30\text{V}, I_C = 0$                          | –   | 0.2 | 4.0 | mA   |
|                                     |               | $V_{BE} = 40\text{V}, I_C = 0$                          | –   | 0.2 | 4.0 | mA   |
|                                     |               | $V_{BE} = 40\text{V}, I_C = 0, T_C = +71^\circ\text{C}$ | –   | 2.7 | 15  | mA   |

Note 1. To avoid excessive heating of the collector junction, perform these tests with an oscilloscope.

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

| Parameter                            | Symbol         | Test Conditions                        | Min | Typ  | Max | Unit |
|--------------------------------------|----------------|--|-----|------|-----|------|
| <b>ON Characteristics</b>            |                |  |     |      |     |      |
| DC Current Gain                      | $h_{FE}$       | $V_{CB} = 2\text{V}, I_C = 5\text{A}$  | 50  | 75   | 100 |      |
|                                      |                | $V_{CB} = 2\text{V}, I_C = 15\text{A}$ | 25  | 47   | –   |      |
|                                      |                | $V_{CB} = 2\text{V}, I_C = 25\text{A}$ | 15  | 38   | –   |      |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$  | $I_C = 5\text{A}, I_B = 500\text{mA}$  | –   | 0.06 | 0.1 | V    |
|                                      |                | $I_C = 25\text{A}, I_B = 2\text{A}$    | –   | 0.2  | 0.3 | V    |
| Base–Emitter ON Voltage              | $V_{BE(on)}$   | $I_C = 5\text{A}, I_B = 500\text{mA}$  | –   | 0.65 | 1.0 | V    |
|                                      |                | $I_C = 25\text{A}, I_B = 2\text{A}$    | –   | 1.0  | 2.0 | V    |
| <b>Dynamic Characteristics</b>       |                |  |     |      |     |      |
| Common–Emitter Cutoff Frequency      | $f_{\alpha e}$ | $V_{CE} = 6\text{V}, I_C = 5\text{A}$  | 2.0 | 2.7  | –   | kHz  |

