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## NTE323 (PNP) & NTE324 (NPN) Silicon Complementary Transistors General Purpose

### Description:

The NTE323 (PNP) and NTE324 (NPN) are complementary silicon epitaxial planer transistors in a TO39 type package designed for use as drivers for high power transistors in general purpose amplifier and switching circuits.

### Absolute Maximum Ratings:

|                                                           |                |
|-----------------------------------------------------------|----------------|
| Collector–Base Voltage ( $I_E = 0$ ), $V_{CBO}$ .....     | 120V           |
| Collector–Emitter Voltage, $V_{CEO}$ .....                | 120V           |
| Emitter–Base Voltage ( $I_C = 0$ ), $V_{EBO}$ .....       | 4V             |
| Collector Current, $I_C$ .....                            | 1A             |
| Base Current, $I_B$ .....                                 | 500mA          |
| Total Power Dissipation, $P_{tot}$                        |                |
| $T_C = +25^\circ\text{C}$ .....                           | 10W            |
| $T_A = +25^\circ\text{C}$ .....                           | 1W             |
| Operating Junction Temperature, $T_J$ .....               | +200°C         |
| Storage Temperature Range, $T_{stg}$ .....                | –65° to +200°C |
| Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....    | 17.4°C/W       |
| Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ ..... | 175°C/W        |

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

| Parameter                            | Symbol         | Test Conditions                                                         | Min | Typ | Max | Unit          |               |
|--------------------------------------|----------------|-------------------------------------------------------------------------|-----|-----|-----|---------------|---------------|
| Collector Cutoff Current             | $I_{CBO}$      | $V_{CB} = 120\text{V}, I_E = 0$                                         | –   | –   | 1   | $\mu\text{A}$ |               |
|                                      | $I_{CEO}$      | $V_{CE} = 80\text{V}, I_B = 0$                                          | –   | –   | 10  | $\mu\text{A}$ |               |
|                                      | $I_{CEV}$      | $V_{CE} = 120\text{V}, V_{BE} = -1.5\text{V}$                           |     | –   | –   | 1             | $\mu\text{A}$ |
|                                      |                | $V_{CE} = 120\text{V}, V_{BE} = -1.5\text{V}, T_C = +150^\circ\text{C}$ |     | –   | –   | 1             | mA            |
| Emitter Cutoff Current               | $I_{EBO}$      | $V_{EB} = 4\text{V}, I_C = 0$                                           | –   | –   | 1   | $\mu\text{A}$ |               |
| Collector–Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 10\text{mA}, I_B = 0, \text{Note 1}$                             | 120 | –   | –   | V             |               |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$  | $I_C = 250\text{mA}, I_B = 25\text{mA}, \text{Note 1}$                  | –   | –   | 0.6 | V             |               |
|                                      |                | $I_C = 500\text{mA}, I_B = 50\text{mA}, \text{Note 1}$                  | –   | –   | 1.0 | V             |               |
|                                      |                | $I_C = 1\text{A}, I_B = 200\text{mA}, \text{Note 1}$                    | –   | –   | 2.0 | V             |               |

Note 1. Pulse Duration = 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 |
|----------------------------|-----------|-------------------------------------------------------------|-----|-----|-----|------|
| Base-Emitter Voltage       | $V_{BE}$  | $V_{CE} = 2\text{V}, I_C = 250\text{mA}$                    | -   | -   | 1.0 | V    |
| DC Current Gain            | $h_{FE}$  | $V_{CE} = 2\text{V}, I_C = 250\text{mA}, \text{Note 1}$     | 40  | -   | 150 | -    |
|                            |           | $V_{CE} = 2\text{V}, I_C = 1\text{A}, \text{Note 1}$        | 5   | -   | -   | -    |
| Transition Frequency       | $f_T$     | $V_{CE} = 10\text{V}, I_C = 100\text{mA}, f = 10\text{MHz}$ | 30  | -   | -   | MHz  |
| Collector-Base Capacitance | $C_{cbo}$ | $V_{CB} = 20\text{V}, I_E = 0, f = 1\text{MHz}$             | -   | -   | 50  | pF   |
| Small-Signal Current Gain  | $h_{fe}$  | $V_{CE} = 1.5\text{V}, I_C = 200\text{mA}, f = 1\text{kHz}$ | 40  | -   | -   | -    |

Note 1. Pulse Duration =  $300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

