



## NTE2315 Silicon NPN Transistor Fast Switching Power Darlington

### **Description:**

The NTE2315 is a silicon epitaxial planer NPN power Darlington transistor in a TO220 type package with an integrated base-emitter speed-up diode designed for use in high voltage, high current, fast switching applications. In particular, the NTE2315 can be used in horizontal output stages of 110° CRT video displays and is primarily intended for large screen displays.

### **Absolute Maximum Ratings:**

|                                                               |                |
|---------------------------------------------------------------|----------------|
| Collector-Base Voltage ( $I_E = 0$ ), $V_{CBO}$               | 400V           |
| Collector-Emitter Voltage ( $V_{BE} = -6V$ ), $V_{CEV}$       | 400V           |
| Collector-Emitter Voltage ( $I_B = 0$ ), $V_{CEO}$            | 200V           |
| Emitter-Base Voltage ( $I_C = 0$ ), $V_{EBO}$                 | 6V             |
| Collector Current, $I_C$                                      |                |
| Continuous                                                    | 8A             |
| Peak                                                          | 15A            |
| Base Current, $I_B$                                           | 2A             |
| Damper Diode Peak Forward Current, $I_{DM}$                   | 10A            |
| Total Power Dissipation ( $T_C \leq +25^\circ C$ ), $P_{tot}$ | 60W            |
| Operating Junction Temperature, $T_J$                         | +150°C         |
| Storage Temperature Range, $T_{stg}$                          | -65° to +150°C |
| Thermal Resistance, Junction-to-Case, $R_{thJC}$              | 2.08°C/W       |
| Thermal Resistance, Junction-to-Ambient, $R_{thJA}$           | 70°C/W         |

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

| Parameter                            | Symbol         | Test Conditions                 | Min | Typ  | Max  | Unit    |
|--------------------------------------|----------------|---------------------------------|-----|------|------|---------|
| Collector Cutoff Current             | $I_{CES}$      | $V_{CE} = 400V, V_{BE} = 0$     | —   | —    | 100  | $\mu A$ |
|                                      | $I_{CEV}$      | $V_{CE} = 400V, V_{BE} = -6V$   | —   | —    | 100  | $\mu A$ |
| Emitter Cutoff Current               | $I_{EBO}$      | $V_{EB} = 6V, I_C = 0$          | —   | —    | 3    | mA      |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 100mA, I_B = 0$ , Note 1 | 200 | —    | —    | V       |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$  | $I_C = 5A, I_B = 50mA$ , Note 1 | —   | —    | -1.5 | V       |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$  | $I_C = 5A, I_B = 50mA$ , Note 1 | —   | —    | 2.0  | V       |
| DC Current Gain                      | $h_{FE}$       | $I_C = 3A, V_{CE} = 5V$         | —   | 3500 | —    |         |

Note 1. Pulse test: Pulse Duration = 300 $\mu s$ , Duty Cycle = 1.5%.

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

| Parameter                    | Symbol           | Test Conditions                                                                                   | Min | Typ  | Max | Unit          |
|------------------------------|------------------|---------------------------------------------------------------------------------------------------|-----|------|-----|---------------|
| Damper Diode Forward Voltage | $V_F$            | $I_F = 4\text{A}$ , Note 1                                                                        | –   | –    | 2   | V             |
| Turn–Off Time                | $t_{\text{off}}$ | $I_C = 5\text{A}$ , $I_{B1} = 50\text{mA}$                                                        | –   | 0.4  | 1.0 | $\mu\text{s}$ |
| <b>Resistive Load</b>        |                  |                                                                                                   |     |      |     |               |
| Turn–On Time                 | $t_{\text{on}}$  | $I_C = 5\text{A}$ , $I_{B1} = 50\text{mA}$ ,<br>$I_{B2} = -500\text{mA}$ , $V_{CC} = 100\text{V}$ | –   | 0.35 | –   | $\mu\text{s}$ |
| Storage Time                 | $t_s$            |                                                                                                   | –   | 0.55 | –   | $\mu\text{s}$ |
| Fall Time                    | $t_f$            |                                                                                                   | –   | 0.20 | –   | $\mu\text{s}$ |

Note 1. Pulse test: Pulse Duration =  $300\mu\text{s}$ , Duty Cycle = 1.5%.

