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NTE3044 Optoisolator NPN Darlington Transistor Output

Description:

The NTE3044 consists of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon photodarlington detector in an 6-Lead DIP type package. This device is designed for use in applications requiring high sensitivity at a low input current.

Features:

- High Sensitivity to Low Input Drive Current
- High Collector–Emitter Breakdown Voltage
- No Base Connction for Improved Noise Immunity

Applications:

- Appliances, Measuring Instruments
- I/O Interfaces for Computers
- Programmable Controllers
- Portable Electronics
- Interfacing and Coupling Systems of Different Potentials and Impedances
- Solid State Relays

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Input LED

| | |
|---|--------------------------|
| Reverse Voltage, V_R | 3V |
| Continuous Forward Current, I_F | 60mA |
| LED Power Dissipation (with Negligible Power in Output Detector, $T_A = +25^\circ\text{C}$), P_D | 120mW |
| Derate Above 25°C | 1.41mW/ $^\circ\text{C}$ |

Output Detector

| | |
|---|--------------------------|
| Collector–Emitter Voltage, V_{CEO} | 80V |
| Emitter–Collector Voltage, V_{ECO} | 5V |
| Detector Power Dissipation (with Negligible Power in Output Detector, $T_A = +25^\circ\text{C}$), P_D .. | 150mW |
| Derate Above 25°C | 1.76mW/ $^\circ\text{C}$ |

Total Device

| | |
|---|-------------------------------------|
| Isolation Surge Voltage (Peak AC Voltage, 60Hz, 1sec Duration, Note 1), V_{ISO} | 7500V |
| Total Device Power Dissipation ($T_A = +25^\circ\text{C}$), P_D | 250mW |
| Derate Above 25°C | 2.94mW/ $^\circ\text{C}$ |
| Ambient Operating Temperature Range, T_A | -55° to $+100^\circ\text{C}$ |
| Storage Temperature Range, T_{stg} | -55° to $+150^\circ\text{C}$ |
| Lead Temperature (During Soldering, 1/16" from Case, 10sec), T_L | $+260^\circ\text{C}$ |

Note 1. Isolation surge voltage is an internal dielectric breakdown rating. For this test, Pin1 and Pin2 are common, and Pin4, Pin5, and Pin6 are common.

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---------------|---|------|-----------|-----|---------------|
| Input LED | | | | | | |
| Reverse Leakage Current | I_R | $V_R = 3\text{V}$ | – | 0.05 | 10 | μA |
| Forward Voltage | V_F | $I_F = 10\text{mA}$ | – | 1.15 | 2.0 | V |
| Capacitance | C | $V_R = 0, f = 1\text{MHz}$ | – | 18 | – | pF |
| Photodarlington ($I_F = 0$) | | | | | | |
| Collector–Emitter Dark Current | I_{CEO} | $V_{CE} = 60\text{V}$ | – | – | 1 | μA |
| Collector–Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 1\text{mA}$ | 80 | – | – | V |
| Emitter–Collector Breakdown Voltage | $V_{(BR)ECO}$ | $I_E = 100\mu\text{A}$ | 5 | – | – | V |
| Coupled | | | | | | |
| Collector Output Current | I_C | $V_{CE} = 1.5\text{V}, I_F = 10\text{mA}$ | 30 | – | – | mA |
| Isolation Surge Voltage | V_{ISO} | 60Hz Peak AC, 5sec, Note 2, Note 3 | 7500 | – | – | V |
| Isolation Resistance | R_{ISO} | $V = 500\text{V}$, Note 2 | – | 10^{11} | – | Ω |
| Isolation Capacitance | C_{ISO} | $V = 0, f = 1\text{MHz}$, Note 2 | – | 0.2 | – | pF |
| Switching | | | | | | |
| Turn–On Time | t_{on} | $V_{CC} = 10\text{V}, R_L = 100\Omega,$ $I_F = 5\text{mA}$ | – | 3.5 | – | μs |
| Turn–Off Time | t_{off} | | – | 95 | – | μs |
| Rise Time | t_r | | – | 1 | – | μs |
| Fall Time | t_f | | – | 2 | – | μs |

Note 2. For this test, LED Pin1 and Pin2 are common and Phototransistor Pin4 and Pin5 are common.
 Note 3. Isolation Surge Voltage, V_{ISO} , is an internal device dielectric breakdown rating.



