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NTE3040 Optoisolator NPN Transistor Output

Description:

The NTE3040 is a gallium arsenide, infrared emitting diode in a 6-Lead DIP type package coupled with a silicon phototransistor.

Applications:

- Power Supply Regulators
- Digital Logic Inputs
- Microprocessor Inputs

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

Infrared Emitting Diode

| | |
|--|-------------------------|
| Power Dissipation, P_D | 150mW |
| Derate above 25°C ambient | 2.0mW/ $^\circ\text{C}$ |
| Forward Current, I_C | |
| Continuous | 100mA |
| Peak (Pulse Width $1\mu\text{sec}$, 300pps) | 3A |
| Reverse Voltage, V_R | 6V |

Phototransistor

| | |
|---|-------------------------|
| Power Dissipation, P_D | 150mW |
| Derate above 25°C ambient | 2.0mW/ $^\circ\text{C}$ |
| Collector-to-Emitter Voltage, V_{CEO} | 30V |
| Collector-to-Base Voltage, V_{CBO} | 70V |
| Emitter-to-Collector Voltage, V_{ECO} | 7V |

Total Device

| | |
|---|-------------------------------------|
| Power Dissipation, P_D | 250mW |
| Derate above 25°C ambient | 3.3mW/ $^\circ\text{C}$ |
| Storage Temperature, T_{stg} | -55° to $+150^\circ\text{C}$ |
| Operating Temperature, T_{opr} | -55° to $+100^\circ\text{C}$ |
| Lead Soldering Temperature (10 seconds) | $+260^\circ\text{C}$ |

Electrical Characteristics: ($T_A = +25^\circ\text{C}$, Note 1, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------|--------|---------------------|-----|-------|------|---------------|
| Infrared Emitting Diode | | | | | | |
| Input Forward Voltage | V_F | $I_F = 10\text{mA}$ | - | 1.18 | 1.50 | V |
| Reverse Leakage Current | I_R | $V_R = 6\text{V}$ | - | 0.001 | 10 | μA |

Note 1. Typical values at $T_A = +25^\circ\text{C}$.

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$, Note 1, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|-------------------|---|-----------|-----|-----|---------------|
| Phototransistor | | | | | | |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 1.0\text{mA}, I_F = 0$ | 30 | 100 | - | V |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}, I_F = 0$ | 70 | 120 | - | V |
| Emitter-Collector Breakdown Voltage | $V_{(BR)ECO}$ | $I_E = 100\mu\text{A}, I_F = 0$ | 7 | 10 | - | V |
| Collector-Emitter Dark Current | I_{CEO} | $V_{CE} = 10\text{V}, I_F = 0$ | - | 1 | 50 | nA |
| Collector-Base Dark Current | I_{CBO} | $V_{CEB} = 10\text{V}$ | - | - | 20 | nA |
| Capacitance | C_{CE} | $V_{CE} = 10\text{V}, f = 1\text{MHz}$ | - | 8 | - | pf |
| Isolation Characteristics | | | | | | |
| Input-Output Isolation Voltage | V_{ISO} | $f = 60\text{Hz}, t = 1 \text{ min.}$ | 5300 | - | - | V_{AC} |
| | | $f = 60\text{Hz}, t = 1 \text{ sec.}$ | 7500 | - | - | V_{AC} |
| Isolation Resistance | R_{ISO} | $V_{I-O} = 500\text{V}_{DC}$ | 10^{11} | - | - | Ω |
| Isolation Capacitance | C_{ISO} | $V_{I-O} = 0, f = 1\text{MHz}$ | - | 0.5 | - | pF |
| Transfer Characteristics | | | | | | |
| DC Current Transfer Ratio | CTR | $I_F = 10\text{mA}, V_{CE} = 10\text{V}$ | 20 | - | - | % |
| Collector-Emitter Saturation Voltage | $V_{CEO(sat)}$ | $I_F = 50\text{mA}, I_C = 2\text{mA}$ | - | - | 0.5 | V |
| Switching Speeds | T_{ON}, T_{OFF} | $I_F = 10\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$ | - | 2 | - | μs |

Note 1. Typical values at $T_A = +25^\circ\text{C}$.

