

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.

Pin Connection Diagram

