

NTE3042 Optoisolator NPN Transistor Output

Description:

The NTE3042 is an optically coupled isolator consisting of a Gallium Arsenide infrared emitting diode and an NPN silicon phototransistor mounted in a standard 6-Lead DIP type package.

Features:

- 1500V Isolation
- High DC Current Transfer Ratio
- Low Cost Dual-In-Line (DIP) Package

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

Input LED

Reverse Voltage, V_R	3V
Forward Current, I_F	
Continuous	60mA
Peak (1 μ s p.w. 300 pps)	3A
LED Power Dissipation, P_D	100mW
Derate Above 25 $^\circ\text{C}$	1.33mW/ $^\circ\text{C}$

Output Transistor

Collector–Emitter Voltage, V_{CEO}	30V
Emitter–Collector Voltage, V_{ECO}	7V
Collector–Base Voltage, V_{CBO}	70V
Detector Power Dissipation, P_D	150mW
Derate Above 25 $^\circ\text{C}$	2.0mW/ $^\circ\text{C}$

Total Device

Input–to–Output Isolation Voltage, V_{ISO}	$\pm 1500\text{V}$
Total Device Power Dissipation, P_D	250mW
Derate Above 25 $^\circ\text{C}$	3.3mW/ $^\circ\text{C}$
Operating Ambient 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	$+260^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Characteristics						
Forward Voltage	V_F	$I_F = 20\text{mA}$	–	–	1.5	V
Reverse Current	I_R	$V_R = 3\text{V}$	–	–	10	μA
Reverse Breakdown Voltage	$V_{(BR)R}$	$I_R = 10\mu\text{A}$	3	–	–	V

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$	30	–	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}$	7	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$	70	–	–	V
Collector–Emitter Dark Current	I_{CEO}	$V_{CE} = 10\text{V}, I_B = 0$	–	–	50	nA
Collector–Base Dark Current	I_{CBO}	$V_{CB} = 10\text{V}, I_E = 0$	–	–	20	nA
Collector–Emitter Capacitance	C_{CE}	$V_{CE} = 0$	–	10	–	pF
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 100\mu\text{A}$	100	150	–	
Coupled Characteristics						
DC Current Transfer Ratio	I_O/I_F	$I_F = 10\text{mA}, V_{CE} = 10\text{V}, I_B = 0$	20	–	–	%
Input–to–Output Isolation Resistance	R_{IO}	$V_{IO} = 500\text{V}$, Note 1	10^{11}	–	–	Ω
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 16\text{mA}, I_C = 2\text{mA}$	–	–	0.4	V
Input–to–Output Capacitance	C_{IO}	$f = 1\text{MHz}$, Note 1	–	0.6	–	pF
Output Rise Time	t_r	$V_{CC} = 10\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$	–	2.0	–	μs
Output Fall Time	t_f		–	2.0	–	μs
Input–to–Output Isolation Voltage	V_{ISO}	Note 1	1500	–	–	V

Note 1. Measured with input leads shorted together and output leads shorted together.

