

NTE3043 Optoisolator NPN Transistor Output

Description:

The NTE3043 is an optically coupled isolator consisting of a Gallium Arsenide infrared emitting diode and an NPN silicon phototransistor mounted in a standard 4-Lead DIP type package.

Features:

- High Output Voltage: $V_{(BR)CEO} = 80V$
- Controlled Current Transfer Ratio
- Maximum Specified Switching Times
- High Isolation Voltage
- Low Cost DIP Type Package

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

Input LED

DC Forward Current, I_F	
Continuous	60mA
Peak (1 μ s p.w. 300pps)	3A
DC Reverse Voltage, V_R	3V
Power Dissipation, P_D	90mW
Derate Above 25 $^{\circ}C$	1.2mW/ $^{\circ}C$

Output Transistor

Collector–Emitter Voltage, V_{CEO}	80V
Emitter–Base Voltage, V_{EBO}	5V
Collector–Base Voltage, V_{CBO}	100V
Power Dissipation, P_D	200mW
Derate Above 25 $^{\circ}C$	2.67mW/ $^{\circ}C$

Coupled

Power Dissipation, P_D	260mW
Derate Above 25 $^{\circ}C$	3.5mW/ $^{\circ}C$
Operating Temperature Range, T_{opr}	–55 $^{\circ}$ to +100 $^{\circ}C$
Storage Temperature Range, T_{stg}	–55 $^{\circ}$ to +150 $^{\circ}C$
Lead Temperature (During Soldering, 1/16" from case, 10sec), T_L	+260 $^{\circ}C$

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	$V_R = 3\text{V}$	–	–	10	μA
Forward Voltage	V_F	$I_F = 20\text{mA}$	–	–	1.5	V
Reverse Breakdown Voltage	V_R	$I_R = 10\mu\text{A}$	3.0	–	–	V
Forward Voltage Temperature Coefficient			–	–1.8	–	$\text{mV}/^\circ\text{C}$
Junction Capacitance	C_J	$V_F = 0, f = 1\text{MHz}$	–	50	–	pF
		$V_F = 1\text{V}, f = 1\text{MHz}$	–	65	–	pF
Output Transistor						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_F = 0$	80	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_F = 0$	5	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$	100	–	–	V
Collector–Emitter Dark Current	I_{CEO}	$V_{CE} = 10\text{V}, I_F = 0$	–	–	60	nA
DC Current Gain	h_{FE}	$V_{CE} = 6\text{V}, I_C = 100\mu\text{A}$	–	170	–	
Collector–Emitter Capacitance		$V_{CE} = 0, f = 1\text{MHz}$	–	8	–	pF
Collector–Base Capacitance		$V_{CE} = 5\text{V}, f = 1\text{MHz}$	–	20	–	pF
Emitter–Base Capacitance		$V_{EB} = 0, f = 1\text{MHz}$	–	10	–	pF
Coupled						
DC Current Transfer Ratio	I_C/I_F	$I_F = 10\text{mA}, V_{CE} = 10\text{V}$	70	125	210	%
		$I_F = 16\text{mA}, V_{CE} = 0.4\text{V}$	–	12.5	–	%
Current Transfer Ratio, Collector–Base		$I_F = 10\text{mA}, V_{CB} = 10\text{V}$	–	0.15	–	%
Input–Output Isolation Resistance	R_{IO}	$V_{ISO} = 500\text{V}_{DC}$	10	–	–	Ω
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 16\text{mA}, I_C = 2\text{mA}$	–	–	0.4	V
Input–Output Capacitance	C_{IO}	$f = 1\text{MHz}$	–	0.5	–	pF
Surge Isolation		Relative Humidity < 50%, $I_1 - 0 < 10\mu\text{b}$	4000	–	–	V_{DC}
		$t = 1\text{sec}$	3000	–	–	V_{AC}
Steady State Isolation		Relative Humidity < 50%	3500	–	–	V_{DC}
		$t = 1\text{min}$	2500	–	–	V_{AC}
Switching Times						
Non–Saturated Turn–On Time	t_{on}	$R_L = 100, I_C = 200\text{mA}, V_{CC} = 5\text{V}$	–	4.5	15	μs
Non–Saturated Turn–Off Time	t_{off}		–	3.5	15	μs
Saturated Turn–On Time	t_{on}	$R_L = 1.9\text{k}\Omega, I_F = 16\text{mA}$	–	3.2	–	μs
Saturated Turn–Off Time	t_{off}		–	50	–	μs

Pin Connection Diagram

