



ELECTRONICS, INC.  
 44 FARRAND STREET  
 BLOOMFIELD, NJ 07003  
 (973) 748-5089  
<http://www.nteinc.com>

## NTE3102 Photon Coupled Interrupter Module NPN Transistor

**Description:**

The NTE3102 Interrupter Module is a single channel switch consisting of a gallium arsenide infrared emitting diode and an NPN silicon photo transistor mounted in a polycarbonate housing. The package is designed to optimize the mechanical resolution, coupling efficiency, ambient light rejection, cost, and reliability. Operating on the principle that objects opaque to infrared will interrupt the transmission of light between an infrared emitting diode and a photo sensor switching the output from an “ON” into an “OFF” state.

**Features:**

- High Gain
- 3mm Gap Between LED and Detector
- Polycarbonate case Protected Against Ambient Light

**Applications:**

- Copiers, Printers, Facsimilies, Record Players, Cassette Decks, Optoelectronic Switches

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

**Total Device**

Operating Temperature Range,  $T_J$  .....  $-25^\circ$  to  $+85^\circ\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-40^\circ$  to  $+85^\circ\text{C}$   
 Lead Temperature (During Soldering, 5sec Max),  $T_L$  .....  $+260^\circ\text{C}$

**Infrared Emitting Diode**

Forward Current,  $I_F$  ..... 50mA  
 Reverse Voltage,  $V_R$  ..... 5V  
 Power Dissipation,  $P_E$  ..... 75mW

**Phototransistor**

Power Dissipation,  $P_D$  ..... 75mW  
 Collector Current,  $I_C$  ..... 20mA  
 Collector–Emitter Voltage,  $V_{CEO}$  ..... 55V  
 Emitter–Collector Voltage,  $V_{ECO}$  ..... 5V

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Emitter</b>						
Reverse Breakdown Voltage	$V_{(BR)R}$	$I_R = 100 \text{ A}$	5	–	–	V
Forward Voltage	$V_F$	$I_F = 50\text{mA}$	–	1.2	1.7	V
Reverse Current	$I_R$	$V_R = 5\text{V}$	–	–	100	A

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Detector</b>						
Collector-Emmitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$	55	-	-	V
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\text{A}$	5	-	-	V
Collector-Emmitter Dark Current	$I_{CEO}$	$V_{CE} = 10\text{V}$	-	-	100	nA
<b>Coupled</b>						
Photodiode Current	$I_{CE(on)}$	$V_{CE} = 5\text{V}, I_F = 5\text{mA}$	0.15	-	-	mA
		$V_{CE} = 5\text{V}, I_F = 20\text{mA}$	1.0	-	-	mA
		$V_{CE} = 5\text{V}, I_F = 30\text{mA}$	1.9	-	-	mA
Collector-Emmitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.8\text{mA}, I_F = 30\text{mA}$	-	-	0.4	V
Turn-On Time	$t_{on}$	$V_{CC} = 5\text{V}, I_F = 30\text{mA}, R_L = 2.5\text{k}^\circ$	-	8	-	s
Turn-Off Time	$t_{off}$		-	50	-	s

