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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° to $+85^\circ\text{C}$
 Storage Temperature Range, T_{stg} -40° 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
Emitter						
Reverse Breakdown Voltage	$V_{(BR)R}$	$I_R = 100\mu\text{A}$	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	μA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Detector						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$	55	–	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}$	5	–	–	V
Collector–Emitter Dark Current	I_{CEO}	$V_{CE} = 10\text{V}$	–	–	100	nA
Coupled						
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–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.8\text{mA}, I_F = 30\text{mA}$	–	–	0.4	V
Turn–On Time	t_{on}	$V_{CC} = 5\text{V}, I_F = 30\text{mA}, R_L = 2.5\text{k}\Omega$	–	8	–	μs
Turn–Off Time	t_{off}		–	50	–	μs

