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NTE3100
Photon Coupled Interrupter Module

Description:
The NTE3100 Interrupter Module is a gallium arsenide infrared emitting diode coupled to a silicon phototransistor on a plastic housing. The package system is designed to optimize the mechanical resolution, coupling efficiency, ambient light rejection, cost, and reliability. The gap in the housing provides a means of interrupting the signal with an opaque material, switching the output from an “ON” into an “OFF” state.

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Total Device
Operating Temperature Range, T_J . . . . . –55° to +100°C
Storage Temperature Range, T_{stg} . . . . . –55° to +100°C
Lead Temperature (During Soldering, 5sec max), T_L . . . . . +260°C

Infrared Emitting Diode
Power Dissipation, P_E 100mW
Derate Above 25°C . . . . . 1.33mW/°C
Forward Current, I_F
Continuous 60mA
Peak (Pulse Width ≤ 1μs, PRR ≤ 300pps) 3A
Reverse Voltage, V_R 6V

Phototransistor
Power Dissipation, P_D 150mW
Derate Above 25°C . . . . . 2.0mW/°C
Continuous Collector Current, I_C 100mA
Collector–Emitter Voltage, V_{CEO} 55V
Emitter–Collector Voltage, V_{ECO} 6V

Electrical Characteristics: (T_A = +25°C, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Emitter						
Reverse Breakdown Voltage	$V_{(BR)R}$	I_R = 10μA	6	–	–	V
Forward Voltage	V_F	I_F = 60mA	–	–	1.7	V
Reverse Current	I_R	V_R = 5V	–	–	100	nA
Capacitance	C_i	V = 0, f = 1MHz	–	30	–	pF

Note 1. Stray irradiation can alter values of characteristics. Adequate shielding should be provided.

Electrical Characteristics (Cont'd): (T_A = +25°C, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Detector						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA	55	–	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	I_E = 100μA	6	–	–	V
Collector Dark Current	I_{CEO}	V_{CE} = 45V	–	–	100	nA
Capacitance	C_{ce}	V_{CE} = 5V, f = 1MHz	–	3.3	5.0	pF
Coupled						
Collector "ON" Current	$I_{CE(on)}$	I_F = 5mA, V_{CE} = 5V	0.15	–	–	mA
		I_F = 20mA, V_{CE} = 5V	1.0	–	–	mA
		I_F = 30mA, V_{CE} = 5V	1.9	–	–	mA
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 30mA, I_C = 1.8mA	–	–	0.40	V
Turn–On Time	t_{on}	V_{CC} = 5V, I_F = 30mA, R_L = 2.5kΩ	–	8	–	μs
Turn–Off Time	t_{off}		–	50	–	μs

Note 1. Stray irradiation can alter values of characteristics. Adequate shielding should be provided.
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