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NTE3098
Optoisolator
Phototransistor w/NPN Transistor Output

Description:

The NTE3098 consists of a phototransistor optically coupled to a gallium arsenide infrared emitting diode in a single 4–Lead DIP type package.

Features:

- Collector–Emitter Voltage: V_{CEO} = 55V Min
- Current Transfer Ratio: I_C/I_F = 100% Min
- Isolation Voltage: BV_S = 5000V_{rms} Min

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

LED

Forward Current, I_F 60mA
Derate above 39°C . . . . . 0.7mA/°C
Pulse Forward Current (100µs Pulse, 100pps), I_{FP} 1A
Power Dissipation, P_D 100mW
Derate above 25°C . . . . . 1mW/°C
Reverse Voltage, V_R 5V
Junction Temperature, T_J . . . . . +125°C

DETECTOR

Collector–Emitter Voltage, V_{CEO} 55V
Emitter–Collector Voltage, V_{ECO} 7V
Collector Current, I_C 50mA
Collector Power Dissipation, P_C 150mW
Derate above 25°C . . . . . 1.5mW/°C
Junction Temperature, T_J . . . . . +125°C

COUPLED

Total Package Power Dissipation, P_T 250mW
Derate above 25°C . . . . . 2.5mW/°C
Isolation Voltage (AC, 1 min., RH ≤ 60%), BV_S . . . . . 5000V_{rms}
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Operating Temperature Range, T_{opr} . . . . . –55° to +100°C
Lead Temperature (During Soldering, 10sec), T_L . . . . . +260°C

Recommended Operating Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		–	5	24	V
Forward Current	I_F		–	16	20	mA
Collector Current	I_C		–	1	10	mA
Operating Temperature	T_{opr}		–25	–	+85	°C

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Individual, LED						
Forward Voltage	V_F	I_F = 10mA	1.00	1.15	1.30	V
Reverse Current	I_R	V_R = 5V	–	–	10	µA
Capacitance	C_T	V = 0, f = 1MHz	–	30	–	pF
Individual, Detector						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 0.5mA	55	–	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	I_E = 0.1mA	7	–	–	V
Collector Dark Current	I_{CEO}	V_{CE} = 24V	–	10	100	nA
		V_{CE} = 24V, T_A = +85°C	–	2	50	µA
Capacitance (Collector–Emitter)	C_{CE}	V = 0, f = 1MHz	–	10	–	pF
Coupled						
Current Transfer Ratio	I_C/I_F	I_F = 5mA, V_{CE} = 5V	100	–	600	%
Current Transfer Ratio (Saturated)	I_C/I_F (sat)	I_F = 1mA, V_{CE} = 0.4V	30	–	–	%
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 0.2mA, I_F = 1mA	–	–	0.4	V
Isolation						
Capacitance (Input–Output)	C_S	V_S = 0, f = 1MHz	–	0.8	–	pF
Isolation Resistance	R_S	V_S = 500V	$5x10^{10}$	10^{14}	–	Ω
Isolation Voltage	BV_S	AC, 1 minute	5000	–	–	V_{rms}
		AC, 1 second	–	10000	–	V_{rms}
		DC, 1 minute	–	10000	–	V_{rms}
Switching						
Rise Time	t_r	V_{CC} = 10V, I_C = 2mA, R_L = 100Ω	–	2	–	µs
Fall Time	t_f		–	3	–	µs
Turn–On Time	t_{on}		–	3	–	µs
Turn–Off Time	t_{off}		–	3	–	µs
Turn–On Time	t_{ON}	V_{CC} = 5V, I_F = 16mA, R_L = 1.9kΩ	–	2	–	µs
Storage Time	t_s		–	15	–	µs
Turn–Off Time	t_{OFF}		–	25	–	µs

Pin Connection Diagram