



ELECTRONICS, INC.
 44 FARRAND STREET
 BLOOMFIELD, NJ 07003
 (973) 748-5089

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: ($T_A = +25^\circ C$ unless otherwise specified)

LED

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

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 $25^\circ C$	1.5mW/ $^\circ C$
Junction Temperature, T_J	+125 $^\circ C$

COUPLED

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Individual, LED						
Forward Voltage	V_F	$I_F = 10\text{mA}$	1.00	1.15	1.30	V
Reverse Current	I_R	$V_R = 5\text{V}$	–	–	10	μA
Capacitance	C_T	$V = 0, f = 1\text{MHz}$	–	30	–	pF
Individual, Detector						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 0.5\text{mA}$	55	–	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 0.1\text{mA}$	7	–	–	V
Collector Dark Current	I_{CEO}	$V_{CE} = 24\text{V}$	–	10	100	nA
		$V_{CE} = 24\text{V}, T_A = +85^\circ\text{C}$	–	2	50	μA
Capacitance (Collector–Emitter)	C_{CE}	$V = 0, f = 1\text{MHz}$	–	10	–	pF
Coupled						
Current Transfer Ratio	I_C/I_F	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	100	–	600	%
Current Transfer Ratio (Saturated)	I_C/I_F (sat)	$I_F = 1\text{mA}, V_{CE} = 0.4\text{V}$	30	–	–	%
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 0.2\text{mA}, I_F = 1\text{mA}$	–	–	0.4	V
Isolation						
Capacitance (Input–Output)	C_S	$V_S = 0, f = 1\text{MHz}$	–	0.8	–	pF
Isolation Resistance	R_S	$V_S = 500\text{V}$	5×10^{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	$V_{CC} = 10\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$	–	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}	$V_{CC} = 5\text{V}, I_F = 16\text{mA}, R_L = 1.9\text{k}\Omega$	–	2	–	μs
Storage Time	t_s		–	15	–	μs
Turn–Off Time	t_{OFF}		–	25	–	μs

Pin Connection Diagram

