

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 = 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

