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NTE3096
Optoisolator
Low LED Drive NPN Transistor Output

Description:

The NTE3096 is a gallium arsenide, infrared emitting diode optically coupled to a silicon phototransistor in a 6–Lead DIP type package. This device is designed for applications requiring low LED drive current, high electrical isolation, small package size and low cost such as interfacing and coupling systems, phase feedback controls, solid–state relays and general purpose switching circuits.

Features:

- High Transfer Ratio with Low LED Drive
- High Electrical Isolation
- Low Collector–Emitter Saturation Voltage

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

Infrared Emitting Diode

Reverse Voltage, V_R 6V

Forward Current, I_C

Continuous 60mA

Peak (Pulse Width 1µsec, 2% Duty Cycle) 3A

Power Dissipation (Negligible Power in Transistor), P_D 100mW

Derate above 25°C ambient . . . . . 1.3mW/°C

Phototransistor

Collector–Emitter Voltage, V_{CEO} 30V

Collector–Base Voltage, V_{CBO} 70V

Emitter–Base Voltage, V_{EBO} 7V

Collector Current (Continuous), I_C 100mA

Power Dissipation (Negligible Power in Transistor), P_D 300mW

Derate above 25°C ambient . . . . . 4.0mW/°C

Total Device

Power Dissipation (Negligible Power in Transistor), P_D 300mW

Derate above 25°C ambient . . . . . 4.0mW/°C

Surge Isolation Voltage (60Hz, Peak AC, 5sec) 7500V

Operating Junction Temperature Range, T_J . . . . . –55° to +100°C

Storage Temperature Range, T_{stg} . . . . . –55° to +150°C

Lead Temperature (During Soldering, 10sec), T_L . . . . . +260°C

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

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Infrared Emitting Diode							
Forward Voltage	V_F	I_F = 1mA, T_A = 0° to +70°C		0.7	1.1	1.4	V
Reverse Leakage Current	I_R	V_R = 6V		–	0.05	10	µA
Capacitance	C_J	V = 0, f = 1MH$_Z$		–	150	–	pf
Phototransistor (I_F = 0 unless otherwise specified)							
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA		30	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 100µA		70	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 100µA		7	–	–	V
Collector–Emitter Dark Current	I_{CEO}	V_{CE} = 5V, Base Open		–	1.0	25	nA
		V_{CE} = 30V, Base Open, T_A = +70°C		–	–	50	µA
Collector–Base Dark Current	I_{CBO}	V_{CB} = 5V, Emitter Open		–	–	10	nA
Coupled Characteristics							
DC Current Transfer Ratio	I_C/I_F	I_F = 1mA, V_{CE} = 5V		50	–	–	%
			T_A = 0° to +70°C	30	–	–	%
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 1mA, I_C = 100µA		–	–	0.5	V
Isolation Resistance	$R_{(I–O)}$	$V_{(I–O)}$ = 500V_{DC}, Note 1		10^{11}	–	–	Ω
Isolation Surge Voltage	V_{ISO}	60Hz, Peak AC, 5sec, Note 1		7500	–	–	V
Isolation Capacitance	$C_{(I–O)}$	$V_{(I–O)}$ = 0, f = 1MH$_Z$		–	1.3	2.5	pF
Switching Characteristics							
Turn–On Time	t_{on}	V_{CE} = 10V, V, R_L = 100Ω		–	–	20	µs
Turn–Off Time	t_{off}			–	–	20	µs

Note 1. For this test, LED Pin1 and Pin2 are common and phototransistor Pin4, Pin5, and Pin6 are common.