

NTE3089 Optoisolator AC Input, Silicon NPN Phototransistor Output

Description:

The NTE3089 consists of two gallium arsenide LEDs connected in inverse parallel and coupled with a silicon phototransistor in a 6-Lead DIP type package.

Features:

- AC or Polarity Insensitive Inputs
- Fast Switching Speeds
- Built-In Reverse Polarity Input Protection
- High Isolation Voltage
- High Isolation Resistance
- I/O Compatible with Integrated Circuits

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

Infrared Emitting Diode (LED)

Continuous Forward Current, I_F	60mA
Peak Forward Current (Pulse Width = $1\mu\text{s}$, 330pps), I_F	$\pm 1\text{A}$
Power Dissipation ($T_A = +25^\circ\text{C}$, Note 1), P_D	100mW
Derate Above 25°C	1.33mW/ $^\circ\text{C}$

Phototransistor

Collector-Emitter Voltage, V_{CEO}	30V
Collector-Base Voltage, V_{CBO}	70V
Emitter-Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	100mA
Power Dissipation ($T_A = +25^\circ\text{C}$), P_D	300mW
Derate Above 25°C	4.0mW/ $^\circ\text{C}$
Power Dissipation ($T_A = +25^\circ\text{C}$, Note 1), P_D	500mW
Derate Above 25°C	6.7mW/ $^\circ\text{C}$

Total Device

Steady-State Isolation Voltage (Input-to-Output)	
Peak	1500V
RMS	1060V
Surge Isolation Voltage (Input-to-Output)	
Peak	2500V
RMS	1770V
Operating Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Lead Temperature (During Soldering for 10sec), T_L	$+250^\circ\text{C}$

Note 1. T_C indicates Collector lead temperature 1/32" from case.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Infrared Emitting Diode (LED)						
Forward Voltage	V_F	$I_F = \pm 10\text{mA}$	–	–	1.5	V
Capacitance	C_J	$V_R = 0, f = 1\text{MHz}$	–	–	100	pF
Phototransistor						
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_F = 0$	70	–	–	V
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}, I_F = 0$	30	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_F = 0$	5	–	–	V
Collector Dark Current	I_{CEO}	$V_{CE} = 10\text{V}, I_F = 0$	–	–	100	nA
Coupled						
DC Current Transfer Ratio	CTR	$V_{CE} = 10\text{V}, I_F = \pm 10\text{mA}$	20	–	–	%
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 0.5\text{mA}, I_F = \pm 10\text{mA}$	–	–	0.4	V
Isolation Resistance	$R_{(I-O)}$	$V_{(I-O)} = 500\text{V}$, Note 2	100	–	–	$\text{G}\Omega$

Note 2. Tests of Input–to–Output isolation current resistance, and capacitance are performed with the input terminals (diode) shorted together and the output terminals (transistors) shorted together.



