

NTE3049 Optoisolator Zero Crossing TRIAC Driver

Description:

The NTE3049 consists of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon detector performing the function of a Zero Voltage crossing bilateral triac driver.

It is designed for use with a triac in the interface of logic systems to equipment powered from 115 Vac lines, such as teletypewriters, CRTs, printers, motors, solenoids, and consumer appliances.

Features:

- Simplifies Logic Control of 110VAC Power
- Zero Voltage Crossing
- High Breakdown Voltage: $V_{DRM} = 250V$ Min
- High Isolation Voltage: $V_{ISO} = 7500V$ Min
- dv/dt of $100V/\mu s$ Typ

Absolute Maximum Ratings: ($T_A = +25^\circ C$, unless otherwise indicated)

Infrared LED

Reverse Voltage, V_R	3V
Continuous Forward Current, I_F	50mA
Total Power Dissipation ($T_A = +25^\circ C$), P_D	120mW
Derate Above $25^\circ C$	1.33mW/ $^\circ C$

Output Driver

Off-State Output Terminal Voltage, V_{DRM}	250V
Peak Repetitive Surge Current ($PW = 100\mu s, 120pps$), I_{TSM}	1A
Total Power Dissipation ($T_A = +25^\circ C$), P_D	150mW
Derate Above $25^\circ C$	1.76mW/ $^\circ C$

Total Device

Isolation Surge Voltage (Peak AC Voltage, 60Hz, 1sec Duration, Note 1), V_{ISO}	7500V
Total Power Dissipation ($T_A = +25^\circ C$), P_D	250mW
Derate Above $25^\circ C$	2.94mW/ $^\circ C$
Junction Temperature Range, T_J	-40° to $+100^\circ C$
Ambient Operating Temperature Range, T_A	-40° to $+85^\circ C$
Storage Temperature Range, T_{stg}	-40° to $+150^\circ C$
Lead Temperature (During Soldering, 10s), T_L	$+260^\circ C$

Note 1 Isolation surge voltage, V_{ISO} , is an internal device dielectric breakdown rating.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input LED						
Reverse Leakage Current	I_R	$V_R = 3\text{V}$	–	0.05	–	μA
Forward Voltage	V_F	$I_F = 30\text{mA}$	–	1.3	1.5	V
Output Detector ($I_F = 0$ unless otherwise specified)						
Leakage, Either Direction	I_{DRM1}	LED OFF, Rated V_{DRM} , Note 2	–	10	100	nA
Peak On-State Voltage, Either Direction	V_{TM}	$I_{\text{TM}} = 100\text{mA Peak}$	–	1.8	3.0	V
Critical Rate of Rise of Off-State Voltage	dv/dt		1000	2000	–	V/ μs
Coupled						
LED Trigger Current	I_{FT}	Main Terminal Voltage = 3V, Note 3	–	–	15	mA
Holding Current, Either Direction	I_H		–	100	–	μA
Isolation Voltage	V_{ISO}	f = 60Hz, t = 1sec	7500	–	–	VAC _{pk}
Zero Crossing						
Inhibit Voltage	V_{IH}	$I_F = 15\text{mA}$, MT ₁ –MT ₂ Voltage above which device will not trigger	–	5	20	V
Leakage in Inhibit State	I_{DRM2}	$I_F = 15\text{mA}$, Rated V_{DRM} , Off-State	–	–	500	μA

Note 2. Test voltage must be applied within dv/dt rating.

Note 3. All devices are guaranteed to trigger at an I_F value less than or equal to Max I_{FT} . Therefore, recommended operating I_F lies between max I_{FT} (15mA) and absolute Max I_F (50mA).

