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## 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, $T_J$ .....	$-40^\circ$ to $+100^\circ C$
Ambient Operating Temperature Range, $T_A$ .....	$-40^\circ$ to $+85^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-40^\circ$ 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
<b>Input LED</b>						
Reverse Leakage Current	$I_R$	$V_R = 3\text{V}$	–	0.05	–	$\mu\text{A}$
Forward Voltage	$V_F$	$I_F = 30\text{mA}$	–	1.3	1.5	V
<b>Output Detector (<math>I_F = 0</math> unless otherwise specified)</b>						
Leakage, Either Direction	$I_{\text{DRM1}}$	LED OFF, Rated $V_{\text{DRM}}$ , Note 2	–	10	100	nA
Peak On-State Voltage, Either Direction	$V_{\text{TM}}$	$I_{\text{TM}} = 100\text{mA Peak}$	–	1.8	3.0	V
Critical Rate of Rise of Off-State Voltage	dv/dt		1000	2000	–	V/ $\mu\text{s}$
<b>Coupled</b>						
LED Trigger Current	$I_{\text{FT}}$	Main Terminal Voltage = 3V, Note 3	–	–	15	mA
Holding Current, Either Direction	$I_H$		–	100	–	$\mu\text{A}$
Isolation Voltage	$V_{\text{ISO}}$	$f = 60\text{Hz}$ , $t = 1\text{sec}$	7500	–	–	VAC <sub>pk</sub>
<b>Zero Crossing</b>						
Inhibit Voltage	$V_{\text{IH}}$	$I_F = 15\text{mA}$ , $\text{MT}_1\text{--MT}_2$ Voltage above which device will not trigger	–	5	20	V
Leakage in Inhibit State	$I_{\text{DRM2}}$	$I_F = 15\text{mA}$ , Rated $V_{\text{DRM}}$ , Off-State	–	–	500	$\mu\text{A}$

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  $I_{\text{FT}}$ . Therefore, recommended operating  $I_F$  lies between max  $I_{\text{FT}}$  (15mA) and absolute Max  $I_F$  (50mA).

