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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/μs Typ

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

Infrared LED

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

Output Driver

Off–State Output Terminal Voltage, V_{DRM} 250V
Peak Repetitive Surge Current (PW = 100μs, 120pps), I_{TSM} 1A
Total Power Dissipation (T_A = +25°C), P_D 150mW
Derate Above 25°C . . . . . 1.76mW/°C

Total Device

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

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input LED						
Reverse Leakage Current	I_R	V_R = 3V	–	0.05	–	µA
Forward Voltage	V_F	I_F = 30mA	–	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_{TM} = 100mA 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 = 15mA, MT_1–MT_2 Voltage above which device will not trigger	–	5	20	V
Leakage in Inhibit State	I_{DRM2}	I_F = 15mA, 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).