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NTE3097
Optoisolator
Zero Crossing TRIAC Driver

Description:

The NTE3097 is an optoisolator in a 6–Lead DIP type package and contains a gallium arsenide IRED optically coupled to a monolithic silicon detector performing the function of a Zero Voltage Crossing bilateral TRIAC Driver. This device is designed for use with a TRIAC in the interface of logic systems to equipment powered from 240VAC lines such as solid–state relays, industrial controls, motors, solenoids, and consumer appliances, etc.

Features:

- Simplifies Logic Control of 240VAC Power
- Zero Voltage Crossing
- High Breakdown Voltage: V_{DRM} = 400V Min
- High Isolation Voltage: V_{ISO} = 7500V Guaranteed
- Small, Economical 6–Lead DIP Package
- dv/dt of 2000V/μs Typ., 1000V/μs Guaranteed

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

Infrared Emitting Diode

Reverse Voltage, V_R 6V
Continuous Forward Current, I_F 60mA
Total Power Dissipation (T_A = +25°C, Negligible Power in Output Driver), P_D 120mW
Derate Above 25°C . . . . . 1.41mW/°C

Output Driver

Off–State Output Terminal Voltage, V_{DRM} 400V
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, 10sec), T_L . . . . . +260°C

Note 1. Isolation surge voltage is an internal dielectric breakdown rating. For this test, Pin1 and Pin2 are common, and Pin4, Pin5, and Pin6 are common.

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 = 6V	–	0.05	10	μA
Forward Voltage	V_F	I_F = 30mA	–	1.3	1.5	V
Output Detector (I_F = 0 unless otherwise specified)						
Leakage With LED OFF	I_{DRM1}	Either Direction, V_{DRM} = 400V, Note 2	–	2	100	nA
Peak On–State Voltage	V_{TM}	Either Direction, I_{TM} = 100mA Peak	–	1.8	3.0	V
Critical Rate of Rise of Off–State Voltage	dv/dt	Note 4	1000	2000	–	V/μs
Coupled						
LED Trigger Current, Current Required to Latch Output	I_{FT}	Main Terminal Voltage = 3V, Note 3	–	–	15	mA
Holding Current	I_H	Either Direction	–	100	–	μA
Isolation Voltage	V_{ISO}	f = 60Hz, t = 1sec	7500	–	–	VAC(pk)
Zero Crossing						
Inhibit Voltage	V_{IH}	I_F = 15mA, MT1–MT2 Voltage Above Which Device Will Not Trigger	–	5	20	V
Leakage in Inhibit State	I_{DRM2}	I_F = 15mA, V_{DRM} = 400V, Off–State	–	–	500	μA

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

Note 3. This device is guaranteed to trigger at an I_{F1} 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 (60mA).

Note 4. This is static dv/dt. Commutating dv/dt is a function of the load–driving thyristor only.

Pin Connection Diagram