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RoHS 2002/95/EC

NTE3091
Optocoupler
Photo SCR Output

Description:

The NTE3091 is an optically coupled SCR with a gallium arsenide infrared emitter and a silicon photo SCR sensor in a 6–Lead DIP type package. Switching can be achieved while maintaining a high degree of isolation between triggering and load circuits. This device can be used in SCR TRIAC and solid state relay applications where high blocking voltages and low input current sensitivity is required.

Features:

- Turn On Current (I_{FT}), 5mA Typical
- Gate Trigger Current (I_{GT}), 20mA Typical
- Surge Anode Current, 5A
- Blocking Voltage, 400V Gate Trigger Voltage (V_{GT}), 0.6V Typical
- Isolation est Voltage 5300V_{RMS}
- Solid State Reliability

Absolute Maximum Rating: (T_A = +25°C, Note 1, unless otherwise specified)

Input

Peak Reverse Voltage, V_{RM} 6V
Forward Current, I_F
  Continuous 60mA
  Peak (1.0ms, 1% Duty Cycle) 3A
Power Dissipation 100mW
  Derate Above 25°C . . . . . 1.33mW/°C

Output

Reverse Gate Voltage, V_{RG} 6V
Anode Voltage (DC or AC Peak), V_A 400V
RMS Forward Current, I_{FRMS} 300mA
Surge Anode Current (10ms Duration), I_{AS} 5A
Peak Forward Current (Pulse Width = 100μs, Duty Cycle = 1%), I_{FM} 10A
Surge Gate Current (5ms Duration), I_{GS} 200mA
Power Dissipation (T_C = +25°C) 1000mW
  Derate Linearly From 25°C . . . . . 13.3mW/°C

Note 1. Stresses in excess of the Absolute Maximum Ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to Absolute Maximum Ratings for extended periods of time can adversely affect reliability.

Absolute Maximum Rating (Cont'd): (T_A = +25°C, Note 1, unless otherwise specified)

Coupler

Isolation Test Voltage, V_{ISO}
(Between Emitter and Detector Referred to Standard Climate 23°C/50% RH, DIN 50014) 5300V
Creepage . . . . . ≥7.0mm
Clearance . . . . . ≥7.0mm
Comparative Tracking Index (Per DIN IEC 112/VDE 0303, Part 1) 175
Isolation Resistance (V_{IO} = 500V), R_{IO}
T_A = +25°C . . . . . $\geq 10^{12}\Omega$
T_A = +100°C . . . . . $\geq 10^{11}\Omega$
Total Package Dissipation, P_{tot} 400mW
Derate Linearly From 25°C . . . . . 5.5mW/°C
Operating Temperature Range, T_{opr} . . . . . –55° to +100°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Lead Temperature (During Soldering, 10sec), T_L . . . . . +260°C

Note 1. Stresses in excess of the Absolute Maximum Ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to Absolute Maximum Ratings for extended periods of time can adversely affect reliability.

Electrical Characteristics: (T_A = +25°C, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input						
Forward Voltage	V_F	I_F = 10mA	–	1.2	1.5	V
Reverse Leakage Current	I_R	V_R = 3V	–	–	10	μA
Capacitance	C_J	V = 0, f = 1MHz	–	50	–	pF
Output						
Forward Blocking Voltage	V_{DM}	I_D = 150μA, R_{GK} = 10kΩ, T_A = +100°C	400	–	–	V
Reverse Blocking Voltage	V_{RM}		400	–	–	V
On−State Voltage	V_T	I_T = 300mA	–	1.1	1.3	V
Holding Current	I_H	R_{GK} = 27kΩ, V_{FX} = 50V	–	–	500	μA
Gate Trigger Voltage	V_{GT}	V_{FX} = 100V, R_{GK} = 27kΩ, R_L = 10kΩ	–	0.6	1.0	V
Forward Leakage Current	I_R	V_{RX} = 400V, R_{GK} = 10kΩ, I_F = 0, T_A = +100°C	–	150	–	μA
Reverse Leakage Current			–	150	–	μA
Capacitance (Anode−Gate)		V = 0, f = 1MHz	–	20	–	pF
Capacitance (Gate−Cathode)		V = 0, f = 1MHz	–	350	–	pF
Coupled						
Turn−On Current	I_{FT}	V_{DM} = 50V, R_{GK} = 10kΩ	–	–	20	mA
		V_{DM} = 100V, R_{GK} = 27kΩ	–	5	11	mA

Note 2. Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

Pin Connection Diagram