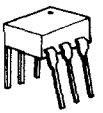
## GE3009-GE3012

# Optoisolator
# GaAs Infrared Emitting Diode and Light Activated Triac Driver

The GE3009-GE3012 series consists of a gallium arsenide, infrared emitting diode coupled with a light activated silicon bilateral switch, which functions like a triac, in a dual in-line package. These devices are also available in surface-mount packaging.

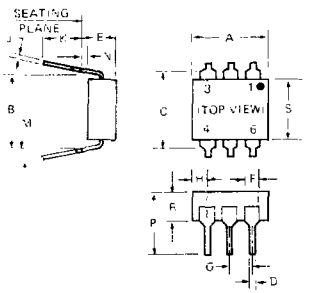
These devices are especially designed for triggering power triacs while maintaining dielectric isolation from the trigger control circuit.



## absolute maximum ratings: (25° C)

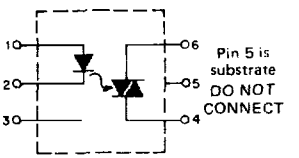
| INFRARED EMITTING DIODE | | |
|---|---|---|
| Power Dissipation | *100 | milliwatts |
| Forward Current (Continuous) | 50 | milliamps |
| Forward Current (Peak) (Pulse width 1 μsec. 300 pps) | 3 | amperes |
| Reverse Voltage | 3 | volts |

*Derate 1.33 mW/°C above 25°C ambient.




| OUTPUT DRIVER | | |
|---|---|---|
| Off-State Output Terminal Voltage | 250 | volts |
| On-State RMS Current (Full Cycle Sine Wave, 50 to 60 Hz) | 100 | milliamps |
| Peak Nonrepetitive Surge Current (PW = 10 ms, DC = 10%) | 1.2 | amperes |
| Total Power Dissipation @ $T_A$ = 25°C | **300 | milliwatts |

**Derate 4.0 mW/°C above 25°C.




| TOTAL DEVICE |
|---|
| Storage Temperature -55°C to +150°C |
| Operating Temperature -40°C to +100°C |
| Lead Soldering Time (at 260°C) 10 seconds |
| Surge Isolation Voltage (Input to Output) |
| 5656 $V_{(peak)}$ 4000 $V_{(RMS)}$ |
| Steady-State Isolation Voltage (Input to Output) |
| 5300 $V_{(peak)}$ 3750 $V_{(RMS)}$ |

UL Covered under U L. component recognition program, reference file E51868

| SYMBOL | MILLIMETERS MIN | MILLIMETERS MAX. | INCHES MIN. | INCHES MAX. | NOTES |
|---|---|---|---|---|---|
| A | 8.36 | 8.89 | .330 | .350 | |
| B | 7.62 REF | | 300 REF | | 1 |
| C | | 5.64 | – | .340 | 2 |
| D | .406 | .508 | .016 | .020 | 3 |
| E | – | 5.08 | – | .200 | |
| F | 1.01 | 1.78 | .040 | .070 | |
| G | 2.28 | 2.80 | .090 | .110 | |
| H | – | 2.16 | | .085 | 4 |
| J | .203 | .305 | .008 | .012 | |
| K | 2.54 | | .100 | – | |
| M | – | 15 | | 15 | |
| N | .381 | – | .015 | – | |
| P | – | 3.53 | – | .375 | |
| R | 2.92 | 3.43 | .115 | .135 | |
| S | 6.10 | 6.86 | .240 | .270 | |

NOTES
1. INSTALLED POSITION LEAD CENTERS
2. OVERALL INSTALLED DIMENSION.
3. THESE MEASUREMENTS ARE MADE FROM THE SEATING PLANE
4. FOUR PLACES

## individual electric characteristics (25° C)

| EMITTER | SYMBOL | TYP. | MAX. | UNITS |
|---|---|---|---|---|
| Forward Voltage ($I_F$ = 10 mA.) | $V_F$ | 1.2 | 1.5 | volts |
| Reverse Current ($V_R$ = 3V) | $I_R$ | — | 100 | microamps |
| Capacitance (V = O, f = 1 MHz) | $C_J$ | 50 | — | picofarads |

| DETECTOR See Note 1 | | SYMBOL | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|
| Peak Off-State Current | $V_{DRM}$ = 250 V | $I_{DRM}$ | — | 100 | nanoamps |
| Peak On-State Voltage | $I_{TM}$ = 100 mA | $V_{TM}$ | 2.5 | 3.0 | volts |
| Critical Rate-of-Rise of Off-State Voltage | $V_{in}$ = 30 $V_{(RMS)}$ (See Figure 1) | dv/dt | 10.0 | — | volts/μsec. |
| Critical Rate-of-Rise of Commutating Off-State Voltage | $I_{load}$ = 15 mA<br>$V_{in}$ = 30 $V_{(RMS)}$ (See Figure 1) | $dv/dt_{(C)}$ | 0.15 | — | volts/μsec. |
| Critical Rate-of-Rise of Off-State Voltage | $V_{in}$ = 140 $V_{(RMS)}$ JEDEC conditions | dv/dt | 6.0 | — | volts/μsec. |

## coupled electrical characteristics (25° C)

| | | SYMBOL | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|
| IRED Trigger Current, Current Required to Latch Output (Main Terminal Voltage = 3.0V, $R_L$ = 150 Ω) | GE3009 | $I_{FT}$ | — | 30 | milliamps |
| | GE3010 | $I_{FT}$ | — | 15 | milliamps |
| | GE3011 | $I_{FT}$ | — | 10 | milliamps |
| | GE3012 | $I_{FT}$ | | 5 | milliamps |
| Holding Current, Either Direction | | $I_H$ | 250 | — | microamps |

NOTE 1: Ratings apply for either polarity of Pin 6 — referenced to Pin 4.

Voltages must be applied within dv/dt rating.

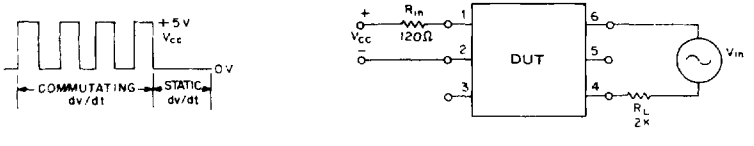



**FIGURE 1. dv/dt — TEST CIRCUIT**

15