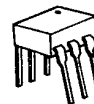


## Photon Coupled Isolator GE3009-GE3012

Ga As Infrared Emitting Diode & Light Activated Triac Driver

The GE Solid State 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)             | 3    | amperes    |
| (Pulse width 1 $\mu$ sec. 300 pps) |      |            |
| Reverse Voltage                    | 3    | volts      |

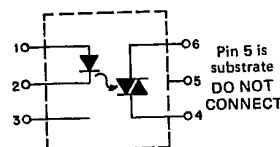
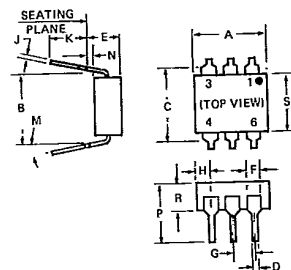
\*Derate 1.33 mW/°C above 25°C ambient.

| OUTPUT DRIVER                                   |       |            |
|-------------------------------------------------|-------|------------|
| Off-State Output Terminal Voltage               | 250   | volts      |
| On-State RMS Current                            | 100   | milliamps  |
| (Full Cycle Sine Wave, 50 to 60 Hz)             |       |            |
| Peak Nonrepetitive Surge Current                | 1.2   | amperes    |
| (PW = 10 ms, DC = 10%)                          |       |            |
| Total Power Dissipation @ T <sub>A</sub> = 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 <sub>(peak)</sub>                         | 4000 V <sub>(RMS)</sub> |
| Steady-State Isolation Voltage (Input to Output) |                         |
| 5300 V <sub>(peak)</sub>                         | 3750 V <sub>(RMS)</sub> |

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



| SYMBOL | MILLIMETERS |      | INCHES    |      | NOTES |
|--------|-------------|------|-----------|------|-------|
|        | MIN.        | MAX. | MIN.      | MAX. |       |
| A      | 8.38        | 8.89 | .330      | .350 | 1     |
| B      | 7.62 REF.   |      | .300 REF. |      | 2     |
| C      | —           | 8.64 | —         | .340 |       |
| D      | .406        | .508 | .016      | .020 | 3     |
| E      | —           | 5.08 | —         | .200 |       |
| F      | 1.01        | 1.78 | .040      | .070 |       |
| G      | 2.28        | 2.80 | .090      | .110 | 4     |
| H      | —           | 2.16 | —         | .085 |       |
| J      | .203        | .305 | .008      | .012 |       |
| K      | 2.54        | —    | .100      | —    |       |
| M      | —           | 15°  | —         | 15°  |       |
| N      | .381        | —    | .015      | —    |       |
| P      | —           | 9.53 | —         | .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.

T-41-87

## Individual electric characteristics (25°C)

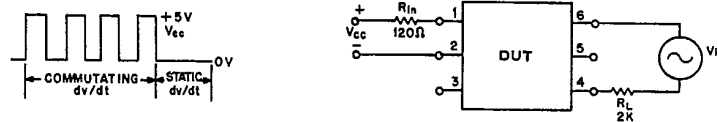
| EMITTER                                       | SYMBOL | TYP. | MAX. | UNITS      |
|-----------------------------------------------|--------|------|------|------------|
| Forward Voltage<br>( $I_F = 10 \text{ mA}$ )  | $V_F$  | 1.2  | 1.5  | volts      |
| Reverse Current<br>( $V_R = 3 \text{ V}$ )    | $I_R$  | —    | 100  | microamps  |
| Capacitance<br>( $V = 0, f = 1 \text{ MHz}$ ) | $C_j$  | 50   | —    | picofarads |

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

## coupled electrical characteristics (25°C)

|                                                                                                               |        | SYMBOL   | TYP. | MAX. | UNITS     |
|---------------------------------------------------------------------------------------------------------------|--------|----------|------|------|-----------|
| IRED Trigger Current, Current Required to Latch Output<br>(Main Terminal Voltage = 3.0V, $R_L = 150 \Omega$ ) | 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

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