

TIC226A, TIC226B, TIC226C, TIC226D, TIC226E, TIC226M, TIC226N, TIC226S

SILICON BIDIRECTIONAL TRIODE THYRISTOR

- 8 A RMS
- 70 A Peak
- Glass Passivated Wafer
- 100 V to 800 V Off-State Voltage
- Max I_{GT} of 50 mA (Quadrants 1-3)
- High-temperature, High-current and high-voltage applications
- Compliance to ROHS

DESCRIPTION

This device is a bidirectional triode thyristor (triac) which may be triggered from the off-state to the on-state by either polarity of gate signal with main Terminal 2 at either polarity.

ABSOLUTE MAXIMUM RATINGS

| Symbol | Ratings | Value | | | | | | | | Unit |
|--------------|---|-------------|-----|-----|-----|-----|-----|-----|-----|------|
| | | A | B | C | D | E | M | S | N | |
| V_{DRM} | Repetitive peak off-state voltage (see Note1) | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | V |
| $I_{T(RMS)}$ | Full-cycle RMS on-state current at (or below) 70°C case temperature (see note2) | 8 | | | | | | | | A |
| I_{TSM} | Peak on-state surge current full-sine-wave (see Note3) | 70 | | | | | | | | A |
| I_{TSM} | Peak on-state surge current half-sine-wave (see Note4) | 8 | | | | | | | | A |
| I_{GM} | Peak gate current | ± 1 | | | | | | | | A |
| P_{GM} | Peak gate power dissipation at (or below) 85°C case temperature (pulse width ≤200 μs) | 2.2 | | | | | | | | W |
| $P_{G(AV)}$ | Average gate power dissipation at (or below) 85°C case (see Note5) | 0.9 | | | | | | | | W |
| T_C | Operating case temperature range | -40 to +110 | | | | | | | | °C |
| T_{stg} | Storage temperature range | -40 to +125 | | | | | | | | °C |
| T_L | Lead temperature 1.6 mm from case for 10 seconds | 230 | | | | | | | | °C |

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THERMAL CHARACTERISTICS

| Symbol | Ratings | Value | Unit |
|-----------------|---|-------------|----------------------|
| $R_{\theta JC}$ | Junction to case thermal resistance | ≤ 1.8 | $^{\circ}\text{C/W}$ |
| $R_{\theta JA}$ | Junction to free air thermal resistance | ≤ 62.5 | |

ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

| Symbol | Ratings | Test Condition(s) | Min | Typ | Max | Unit |
|-----------------|--|--|---------|-----------|-----------|------------------|
| I_{DRM} | Repetitive peak off-state current | $V_D = \text{Rated } V_{DRM}, I_G = 0$ $T_C = 110^{\circ}\text{C}$ | - | - | ± 2 | mA |
| I_{GT} | Gate trigger current | $V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | 2 | 50 | mA |
| | | $V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | -12 | -50 | |
| | | $V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | -9 | -50 | |
| | | $V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | 20 | - | |
| V_{GT} | Gate trigger voltage | $V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | 0.7 | 2 | V |
| | | $V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | -0.8 | -2 | |
| | | $V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | -0.8 | -2 | |
| | | $V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(g)} = > 20\ \mu\text{s}$ | - | 0.9 | 2 | |
| I_H | Holding current | $V_{supply} = +12\text{ V}\dagger, I_G = 0$ initiating $I_{TM} = 100\text{ mA}$ | - | 5 | 30 | mA |
| | | $V_{supply} = -12\text{ V}\dagger, I_G = 0$ initiating $I_{TM} = -100\text{ mA}$ | - | -9 | -30 | |
| I_L | Latching current | $V_{supply} = +12\text{ V}\dagger$ (see Note 7) | - | - | 50 | mA |
| | | $V_{supply} = -12\text{ V}\dagger$ (see Note 7) | - | - | -50 | |
| V_{TM} | Peak on-state voltage | $I_{TM} = \pm 12\text{ A}, I_G = 50\text{ mA}$ (see Note 6) | - | ± 1.6 | ± 2.1 | V |
| dv/dt | Critical rate of rise of off-state voltage | $V_{DRM} = \text{Rated } V_{DRM}, I_G = 0$ $T_C = 110^{\circ}\text{C}$ | - | ± 100 | - | V/ μs |
| dv/dt_{\odot} | Critical rise of communication voltage | $V_{DRM} = \text{Rated } V_{DRM}, I_{TRM} = \pm 12\text{ A}$ $T_C = 85^{\circ}\text{C}$ | ± 5 | - | - | |

† All voltages are with respect to Main Terminal 1.

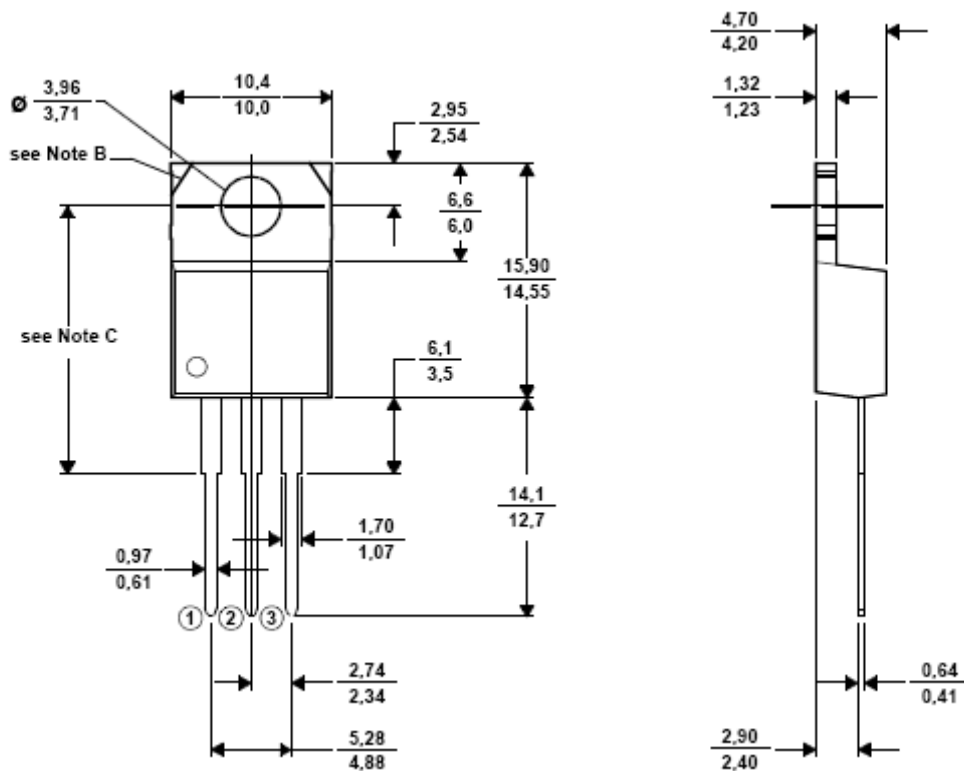
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Notes:

1. These values apply bidirectionally for any value of resistance between the gate and Main Terminal 1.
2. This value applies for 50-Hz full-sine-wave operation with resistive load. Above 85°C derate linearly to 110°C case temperature at the rate of 320 mA/°C.
3. This value applies for one 50-Hz full-sine-wave when the device is operating at (or below) the rated value of on-state current. Surge may be repeated after the device has returned to original thermal equilibrium. During the surge, gate control may be lost.
4. This value applies for one 50-Hz half-sine-wave when the device is operating at (or below) the rated value of on-state current. Surge may be repeated after the device has returned to original thermal equilibrium. During the surge, gate control may be lost.
5. This value applies for a maximum averaging time of 20 ms.
6. This parameters must be measured using pulse techniques, $t_w = \leq 1\text{ms}$, duty cycle $\leq 2\%$, voltage-sensing contacts, separate from the current-carrying contacts are located within 3.2mm (1/8 inch) from the device body.
7. The triacs are triggered by a 15-V (open circuit amplitude) pulse supplied by a generator with the following characteristics : $R_G = 100\Omega$, $t_{p(g)} = 20\ \mu\text{s}$, $t_r = \leq 15\text{ns}$, $f = 1\ \text{kHz}$.

MECHANICAL DATA CASE TO-220

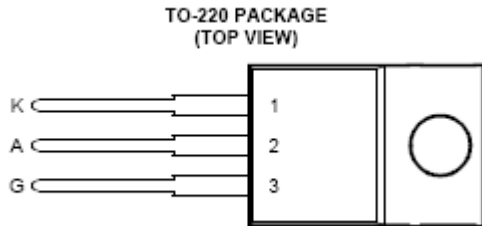
TO220





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PINNING



| | |
|---------|---------|
| Pin 1 : | kathode |
| Pin 2 : | Anode |
| Pin 3 : | Gate |

Pin 2 is in electrical contact with the mounting base.

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