# TIC246B, TIC246C, TIC246D, TIC246E, TIC246M, TIC246N, TIC246S

## SILICON BIDIRECTIONAL TRIODE THYRISTOR

- High current triacs
- 16 A RMS
- 70 A Peak
- Glass Passivated Wafer
- 200 V to 800 V Off-State Voltage
- Max $I_{GT}$ of 50 mA (Quadrants 1-3)
- 125 A peak current
- **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 |
|---|---|---|---|---|---|---|---|---|---|
| | | B | C | D | E | M | S | N | |
| $V_{DRM}$ | Repetitive peak off-state voltage (see Note1) | 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) | 16 | | | | | | | A |
| $I_{TSM}$ | Peak on-state surge current full-sine-wave (see Note3) | 125 | | | | | | | A |
| $I_{GM}$ | Peak gate current | ± 1 | | | | | | | A |
| $T_C$ | 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 |

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 70°C derate linearly to 110°C case temperature at the rate of 400 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 peak reverse voltage and on-state current. Surge may be repeated after the device has returned to original thermal equilibrium.

COMSET SEMICONDUCTORS

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## THERMAL CHARACTERISTICS

| Symbol | Ratings | Value | Unit |
|---|---|---|---|
| $R_{\partial JC}$ | Junction to case thermal resistance | ≤ 1.9 | °C/W |
| $R_{\partial JA}$ | Junction to free air thermal resistance | ≤ 62.5 | |

## ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

| Symbol | Ratings | Test Condition(s) | Min | Typ | Mx | Unit |
|---|---|---|---|---|---|---|
| $I_{DRM}$ | Repetitive peak off-state current | $V_D$ = Rated $V_{DRM}$, , $I_G$ = 0, $T_C$ = 110°C | - | - | ±2 | mA |
| $I_{GT}$ | Gate trigger current | $V_{supply}$ = +12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | 12 | 50 | mA |
| | | $V_{supply}$ = +12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | -19 | -50 | |
| | | $V_{supply}$ = -12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | -16 | -50 | |
| | | $V_{supply}$ = -12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | 34 | - | |
| $V_{GT}$ | Gate trigger voltage | $V_{supply}$ = +12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | 0.8 | 2 | V |
| | | $V_{supply}$ = +12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | -0.8 | -2 | |
| | | $V_{supply}$ = -12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | -0.8 | -2 | |
| | | $V_{supply}$ = -12 V†, $R_L$ = 10 Ω, $t_{p(g)}$ = > 20 µs | - | 0.9 | 2 | |
| $I_H$ | Holding current | $V_{supply}$ = +12 V†, $I_G$ = 0, initiating $I_{TM}$ = 100 mA | - | 22 | 40 | mA |
| | | $V_{supply}$ = -12 V†, $I_G$ = 0, initiating $I_{TM}$ = -100 mA | - | -22 | -40 | |
| $I_L$ | Latching current | $V_{supply}$ = +12 V† (seeNote5) | - | - | 80 | mA |
| | | $V_{supply}$ = -12 V† (seeNote5) | - | - | -80 | |
| $V_{TM}$ | Peak on-state voltage | $I_{TM}$ = ± 22.5 A, $I_G$ = 50 mA (see Note4) | - | ±1.4 | ±1.7 | V |
| dv/dt | Critical rate of rise of off-state voltage | $V_{DRM}$ = Rated $V_{DRM}$, $I_G$ = 0 $T_C$ = 110°C | - | ±400 | - | V/µs |
| di/dt | Critical rate of rise of off-state current | $V_{DRM}$ = Rated $V_{DRM}$, $I_{GT}$ = 50 mA, $di_G/dt$ = 50mA/µs, $T_C$ = 110°C | - | ±100 | - | A/µs |
| $dv/dt_{©}$ | Critical rise of communication voltage | $V_{DRM}$ = Rated $V_{DRM}$, $I_T$ = 1.4 $I_{T(RMS)}$ di/dt = 0.5 $I_{T(RMS)}$/ms, $T_C$ = 80°C | ±1.2 | ±9 | - | V/µs |

† All voltages are whit respect to Main Terminal 1.

Note 4: This parameters must be measured using pulse techniques, $t_W$ = ≤1ms, duty cycle ≤ 2 %, voltage-sensing contacts, separate from the current-carrying contacts are located within 3.2mm (1/8 inch) from de device body.
Note 5: The triacs are triggered by a 15-V (open circuit amplitude) pulse supplied by a generator with the following characteristics : $R_G$ = 100Ω, $_{tp(g)}$ = 20 µs, $t_r$ = ≤ 15ns, f = 1 kHz.

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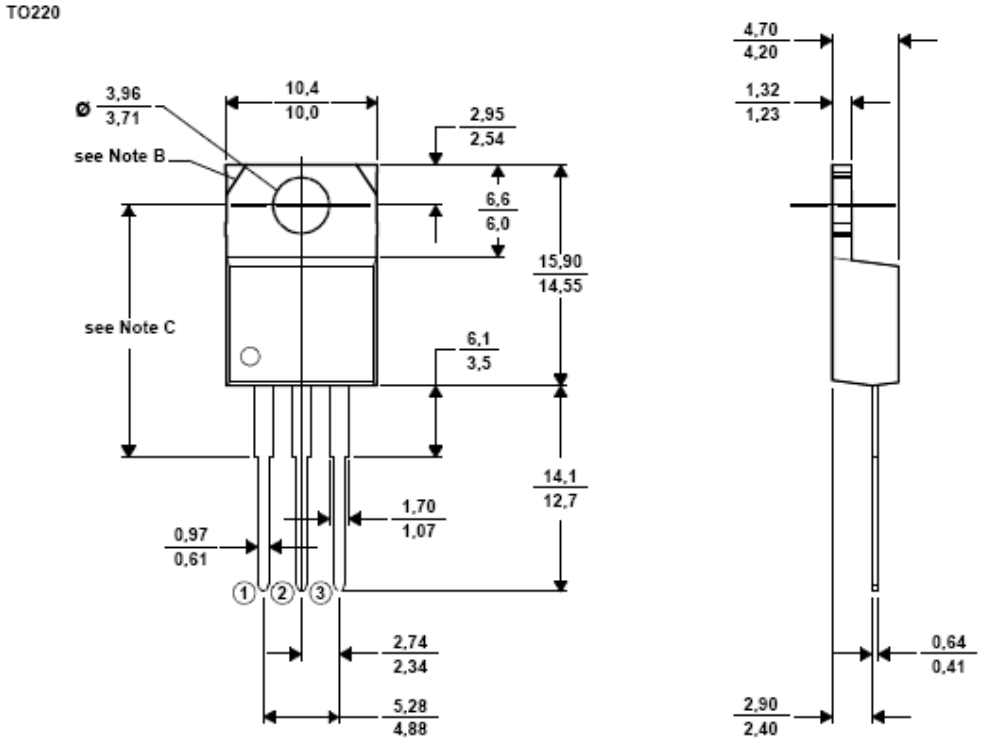
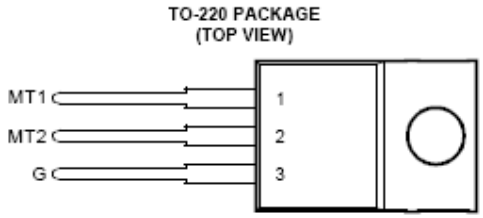
## MECHANICAL DATA CASE TO-220




Pin 2 is in electrical contact with the mounting base.

| | |
|---|---|
| Pin 1 : | Main Terminal 1 |
| Pin 2 : | Main Terminal 2 |
| Pin 3 : | Gate |