



## TIC216A, TIC216B, TIC216D, TIC216M, TIC216N, TIC216S

### SILICON BIDIRECTIONAL TRIODE THYRISTOR

- 6 A RMS
- Glass Passivated Wafer
- 100 V to 800 V Off-State Voltage
- Max  $I_{GT}$  of 5 mA (Quadrants 1-3)
- Sensitive gate triacs
- **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	D	M	S	N	
$V_{DRM}$	Repetitive peak off-state voltage (see Note1)	100	200	400	600	700	800	V
$I_{T(RMS)}$	Full-cycle RMS on-state current at (or below) 70°C case temperature (see note2)	6						A
$I_{TSM}$	Peak on-state surge current full-sine-wave (see Note3)	60						A
$I_{TSM}$	Peak on-state surge current half-sine-wave (see Note4)	70						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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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 150 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.

## THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
$R_{\theta JC}$	Junction to case thermal resistance	$\leq 2.5$	°C/W
$R_{\theta JA}$	Junction to free air thermal resistance	$\leq 62.5$	

## ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit
$I_{DRM}$	Repetitive peak off-state current	$V_D = \text{Rated } V_{DRM}, I_G = 0, T_C = 110^\circ\text{C}$	-	-	$\pm 2$	mA
$I_{GT}$	Gate trigger current	$V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	5	mA
		$V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	-5	
		$V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	-5	
		$V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	10	
$V_{GT}$	Gate trigger voltage	$V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	2.2	V
		$V_{supply} = +12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	-2.2	
		$V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	-2.2	
		$V_{supply} = -12\text{ V}\dagger, R_L = 10\ \Omega, t_{p(e)} = > 20\ \mu\text{s}$	-	-	3	
$I_H$	Holding current	$V_{supply} = +12\text{ V}\dagger, I_G = 0, \text{initiating } I_{TM} = 100\text{ mA}$	-	-	30	mA
		$V_{supply} = -12\text{ V}\dagger, I_G = 0, \text{initiating } I_{TM} = -100\text{ mA}$	-	-	-30	
$I_L$	Latching current	$V_{supply} = +12\text{ V}\dagger \text{ (see Note 7)}$	-	50	-	mA
		$V_{supply} = -12\text{ V}\dagger \text{ (see Note 7)}$	-	-20	-	
$V_{TM}$	Peak on-state voltage	$I_{TM} = \pm 8.4\text{ A}, I_G = 50\text{ mA}$ (see Note 6)	-	-	$\pm 1.7$	V
$dv/dt$	Critical rate of rise of off-state voltage	$V_{DRM} = \text{Rated } V_{DRM}, I_G = 0, T_C = 110^\circ\text{C}$	-	$\pm 50$	-	V/ $\mu\text{s}$
$dv/dt_{\text{c}}$	Critical rise of communication voltage	$V_{DRM} = \text{Rated } V_{DRM}, I_{TRM} = \pm 8.4\text{ A}, T_C = 70^\circ\text{C}$	$\pm 5$	-	-	

† All voltages are with respect to Main Terminal 1.

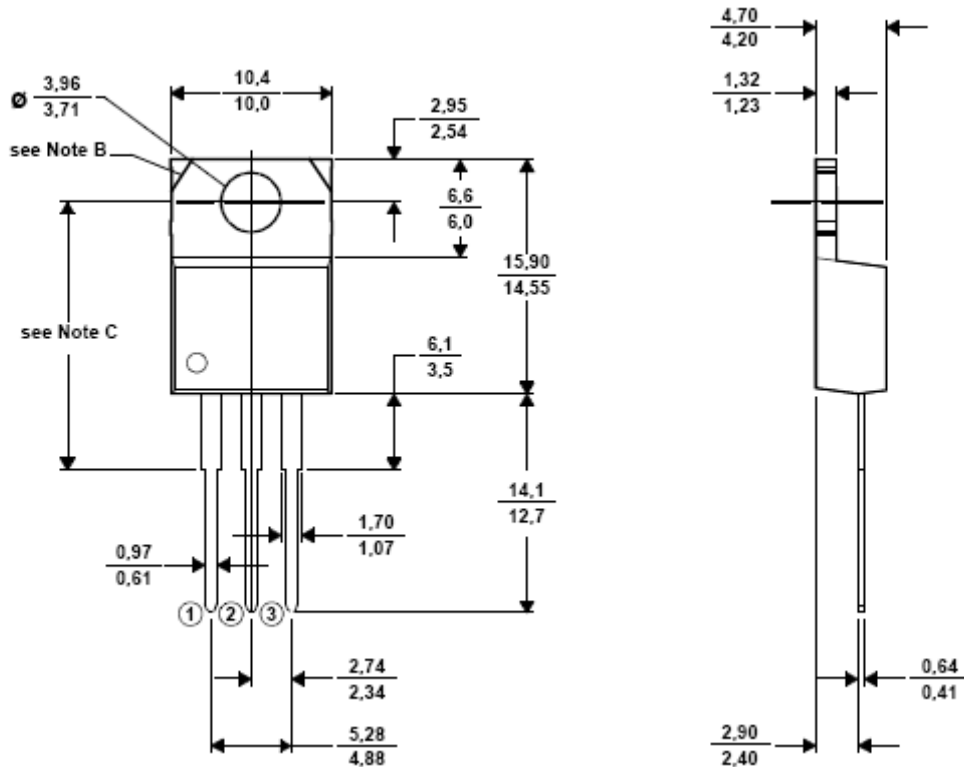
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Note 6: This parameters must be measured using pulse techniques,  $t_w = \leq 1\mu s$ , duty cycle  $\leq 2\%$ , voltage-sensing contacts, separate from the current-carrying contacts are located within 3.2mm (1/8 inch) from the device body.

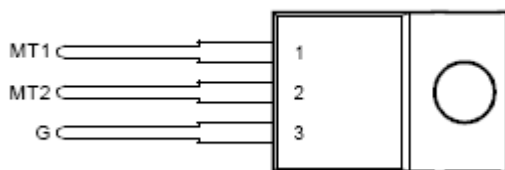
Note 7: The triacs are triggered by a 15-V (open circuit amplitude) pulse supplied by a generator with the following characteristics :  $R_G = 100\Omega$ ,  $t_{p(g)} = 20\mu s$ ,  $t_r = \leq 15ns$ ,  $f = 1\text{ kHz}$ .

### MECHANICAL DATA CASE TO-220

TO220



TO-220 PACKAGE  
(TOP VIEW)



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

Pin 2 is in electrical contact with the mounting base.