

8961726 TEXAS INSTR (OPTO)

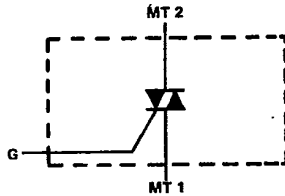
62C 36714 D

TIC216A, TIC216B, TIC216C, TIC216D,
TIC216E, TIC216M, TIC216S, TIC216N
SILICON TRIACS
REVISED OCTOBER 1984

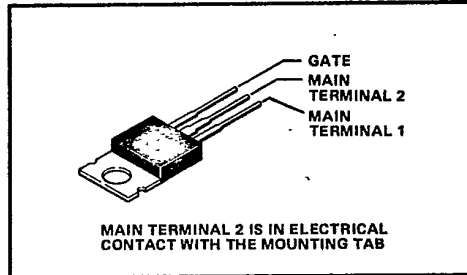
T-25-15

- Sensitive-Gate Triacs
- 100 V to 800 V
- MAX IGT of 5 mA (Quadrants 1-3)

device schematic



TO-220AB PACKAGE



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	TIC216A	TIC216B	TIC216C	TIC216D
Repetitive peak off-state voltage, V_{DRM} (see Note 1)	100 V	200 V	300 V	400 V
Full-cycle RMS on-state current at (or below) 70°C case temperature $I_T(RMS)$ (see Note 2)	6 A			
Peak on-state surge current, full sine wave, I_{TSM} (see Note 3)	60 A			
Peak on-state surge current half sine wave, I_{TSM} (see Note 4)	70 A			
Peak gate current, I_{GM}	1 A			
Peak gate power dissipation, P_{GM} , at (or below) 70°C case temperature (pulse duration < 200 μ s)	2.2 W			
Average gate power dissipation, $P_{G(av)}$, at (or below) 70°C case temperature (see Note 5)	0.9 W			
Operating case temperature range	-40°C to 110°C			
Storage temperature range	-40°C to 125°C			
Lead temperature 1.6 mm (1/16 inch) 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 150 mW/°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.

4
TIC Devices

8961726 TEXAS INSTR (OPTO)

62C 36715 D

T-25-15

TIC216A, TIC216B, TIC216C, TIC216D,
TIC216E, TIC216M, TIC216S, TIC216N
SILICON TRIACS

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	TIC216E	TIC216M	TIC216S	TIC216N
	500 V	600 V	700 V	800 V
Repetitive peak off-state voltage, V_{DRM} (see Note 1)				
Full-cycle RMS on-state current at (or below) 70°C case temperature, $I_T(RMS)$ (see Note 2)	6 A			
Peak on-state surge current, full sine wave, I_{TSM} (see Note 3)	60 A			
Peak on-state surge current half sine wave, I_{TSM} (see Note 4)	70 A			
Peak gate current, I_{GM}	1 A			
Peak gate power dissipation, P_{GM} , at (or below) 70°C case temperature (pulse duration $\leq 200 \mu s$)	2.2 W			
Average gate power dissipation, $P_{G(av)}$, at (or below) 70°C case temperature (see Note 5)	0.9 W			
Operating case temperature range	-40°C to 110°C			
Storage temperature range	-40°C to 125°C			
Lead temperature 1,6 mm (1/16 inch) 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 100 mW/°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.

4

TIC Devices

8961726 TEXAS INSTR (OPT0)

62C 36716 D

TIC216A, TIC161B, TIC161C, TIC161D,
TIC216E, TIC216M, TIC216S, TIC216N
SILICON TRIACS

electrical characteristics at 25°C case temperature (unless otherwise noted)

7-25-15

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
I_{DRM}	Repetitive Peak Off-State Current	$V_{DRM} = \text{Rated } V_{DRM}, I_G = 0, T_C = 110^\circ\text{C}$			± 2	mA
I_{GTM}	Peak Gate Trigger Current	$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			5	mA
		$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			-5	
		$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			-5	
		$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			10	
V_{GTM}	Peak Gate Trigger Voltage	$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			2.2	V
		$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			-2.2	
		$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			-2.2	
		$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{w(g)} \geq 20\mu\text{s}$			3	
V_{TM}	Peak On-State Voltage	$I_{TM} = 8.4A, I_G = 50mA, \text{ See Note 6}$			± 1.7	mA
I_H	Holding Current	$V_{supply} = +12V^\dagger, I_G = 0, \text{ Initiating } I_{TM} = 100mA$			+30	mA
		$V_{supply} = -12V^\dagger, I_G = 0, \text{ Initiating } I_{TM} = -100mA$			-30	
I_L	Latching Current	$V_{supply} = +12V^\dagger, \text{ See Note 7}$			50	mA
		$V_{supply} = -12V^\dagger, \text{ See Note 7}$			-20	
dv/dt	Critical Rate of Rise of Off-State Voltage	$V_{DRM} = \text{Rated } V_{DRM}, I_G = 0, T_C = 110^\circ\text{C}$			50	V/ μs
dv/dt(c)	Critical Rise of Commutation Voltage	$V_{DRM} = \text{Rated } V_{DRM}, I_{TRM} = \pm 8.4A, T_C = 70^\circ\text{C}$			5	V/ μs

† All voltages are with respect to Main Terminal 1.

- NOTES: 6. These parameters must be measured using pulse techniques, $t_w < 1\text{ ms}$, duty cycle $< 2\%$. Voltage-sensing contacts, separate from the current-carrying contacts, are located within 3.2 mm (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: $R_G = 100\Omega, t_w = 20\mu\text{s}, t_r < 15\text{ ns}, t_f \leq 15\text{ ns}, f = 1\text{ kHz}$.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$			2.5	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$			62.5	$^\circ\text{C}/\text{W}$



TIC Devices