

8961726 TEXAS INSTR (OPTO)

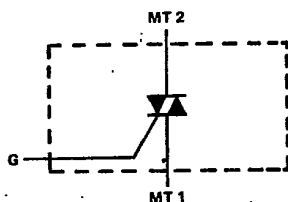
62C 36708 D

TIC206A, TIC206B, TIC206C, TIC206D,
TIC216E, TIC206M, TIC206S, TIC206N
SILICON TRIACS
REVISED OCTOBER 1984

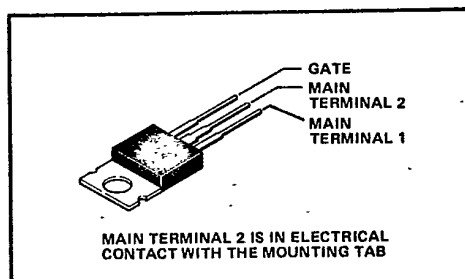
- Sensitive-Gate Triacs
- 100 V to 800 V
- 4 A RMS
- MAX IGT of 5 mA (Quadrants 1-3)

T-25-13

device schematic



TO-220AB PACKAGE



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

	TIC206A	TIC206B	TIC206C	TIC206D
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) 85°C case temperature	4 A			
$I_T(RMS)$ (see Note 2)	4 A			
Peak on-state surge current, full-sine-wave, I_{TSM} (see Note 3)	25 A			
Peak on-state surge current half-sine-wave, I_{TSM} (see Note 4)	30 A			
Peak gate current, I_{GM}	± 0.2 A			
Peak gate power dissipation, P_{GM} , at (or below) 85°C case temperature (pulse duration $\leq 200 \mu s$)	1.3 W			
Average gate power dissipation, $P_{G(av)}$, at (or below) 85°C case temperature (see Note 5)	0.3 W			
Operating case temperature range	-40°C to 110°C			
Storage temperature range	-40°C to 125°C			
Lead temperature 3,2 mm (1/8 inch) from case for 10 seconds	230°C			

- NOTES:
- These values apply bidirectionally for any value of resistance between the gate and Main Terminal 1.
 - 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 120 mA/°C.
 - 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.
 - 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.
 - This value applies for a maximum averaging time of 20 ms.

TIC Devices

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8961726 TEXAS INSTR (OPTO)

62C 36709 D

TIC206A, TIC206B, TIC206C, TIC206D,
TIC206E, TIC206M, TIC206S, TIC206N
SILICON TRIACS

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

	TIC206E	TIC206M	TIC206S	TIC206N
Repetitive peak off-state voltage, V_{DRM} (see Note 1)	500 V	600 V	700 V	800 V
Full-cycle RMS on-state current at (or below) 85°C case temperature $I_T(RMS)$ (see Note 2)	4 A			
Peak on-state surge current, full-sine-wave, I_{TSM} (see Note 3)	25 A			
Peak on-state surge current half-sine-wave, I_{TSM} (see Note 4)	30 A			
Peak gate current, I_{GM}	± 0.2 A			
Peak gate power dissipation, P_{GM} , at (or below) 85°C case temperature (pulse duration $\leq 200 \mu s$)	1.3 W			
Average gate power dissipation, $P_{G(av)}$, at (or below) 85°C case temperature (see Note 5)	0.3 W			
Operating case temperature range	-40°C to 110°C			
Storage temperature range	-40°C to 125°C			
Lead temperature 3,2 mm (1/8 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 85°C derate linearly to 110°C case temperature at the rate of 120 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.

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TIC Devices

8961726 TEXAS INSTR (OPTO)

62C 36710 D

TIC206A, TIC206B, TIC206C, TIC206D,
TIC206E, TIC206M, TIC206S, TIC206N
SILICON TRIACS

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

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PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
I_{DRM} Repetitive Peak Off-State Current	$V_{DRM} = \text{Rated } V_{DRM}, I_G = 0, T_C = 110^\circ\text{C}$		± 1		mA
I_{GTM} Peak Gate Trigger Current	$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		0.5	5	mA
	$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		-1.5	-5	
	$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		-2	-5	
	$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		3.6	10	
V_{GTM} Peak Gate Trigger Voltage	$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		0.7	2	V
	$V_{supply} = +12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		-0.7	-2	
	$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		-0.8	-2	
	$V_{supply} = -12V^\dagger, R_L = 10\Omega, t_{W(g)} \geq 20\mu\text{s}$		0.8	2	
V_{TM} Peak On-State Voltage	$I_{TM} = \pm 4.2\text{ A}, I_G = 50\text{ mA}, \text{ See Note 6}$	± 1.3	± 2.2		V
I_H Holding Current	$V_{supply} = +12V^\dagger, I_G = 0, \text{ Initiating } I_{TM} = 100\text{ mA}$		2	15	mA
	$V_{supply} = -12V^\dagger, I_G = 0, \text{ Initiating } I_{TM} = -100\text{ mA}$		-4	-15	
I_L Latching Current	$V_{supply} = +12V^\dagger, \text{ See Note 7}$			30	mA
	$V_{supply} = -12V^\dagger, \text{ See Note 7}$			-30	
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	$V_{DRM} = \text{Rated } V_{DRM}, I_{TRM} = \pm 4.2\text{ A}, T_C = 85^\circ\text{C}$	1	1.3	2.5	V/ μs

[†] All voltages are with respect to Main Terminal 1.NOTES: 6. These 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 3.2 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: $R_G = 100\Omega, t_W = 20\mu\text{s}, t_r \leq 15\text{ ns}, t_f \leq 15\text{ ns}, f = 1\text{ kHz}$.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$			7.8	$^\circ\text{C/W}$
$R_{\theta JA}$			62.5	

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TIC Devices

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62C 36711 D

TIC206A, TIC206B, TIC206C, TIC206D,
TIC206E, TIC206M, TIC206S, TIC206N
SILICON TRIACS

T-25-13

TYPICAL CHARACTERISTICS

GATE TRIGGER CURRENT
vs
TEMPERATURE

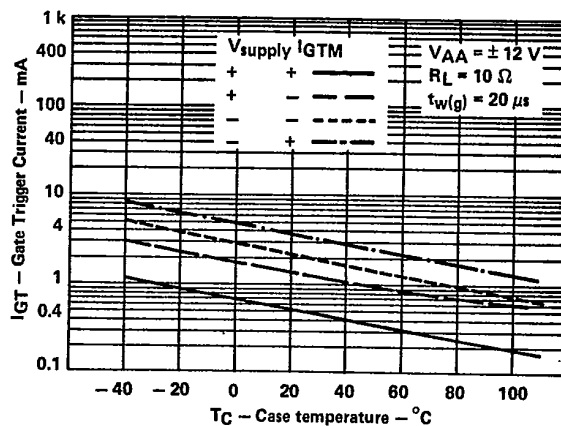


FIGURE 1

GATE TRIGGER VOLTAGE
vs
TEMPERATURE

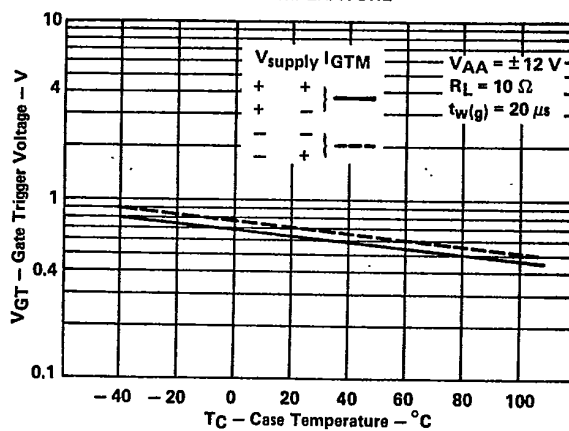


FIGURE 2

TIC Devices

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62C 36712 D

TIC206A, TIC206B, TIC206C, TIC206D,
TIC206E, TIC206M, TIC206S, TIC206N
SILICON TRIACS

TYPICAL CHARACTERISTICS

T-25-13

HOLDING CURRENT
vs
TEMPERATURE

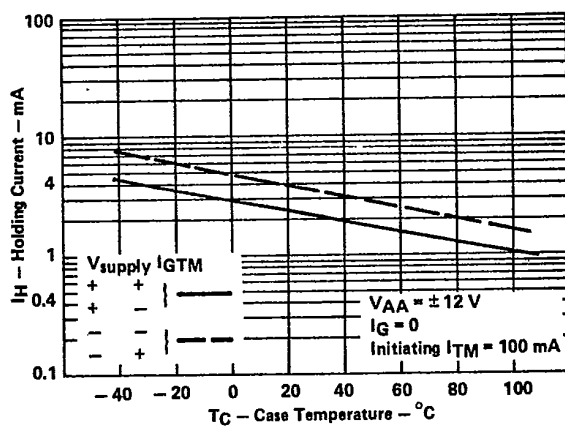


FIGURE 3

GATE FORWARD VOLTAGE
vs
GATE FORWARD CURRENT

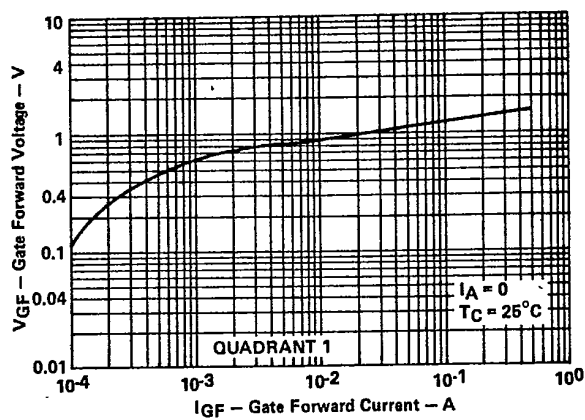


FIGURE 4

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TIC Devices

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TIC206A, TIC206B, TIC206C, TIC206D,
TIC206E, TIC206M, TIC206S, TIC206N
SILICON TRIACS

TYPICAL CHARACTERISTICS

LATCHING CURRENT
vs
TEMPERATURE

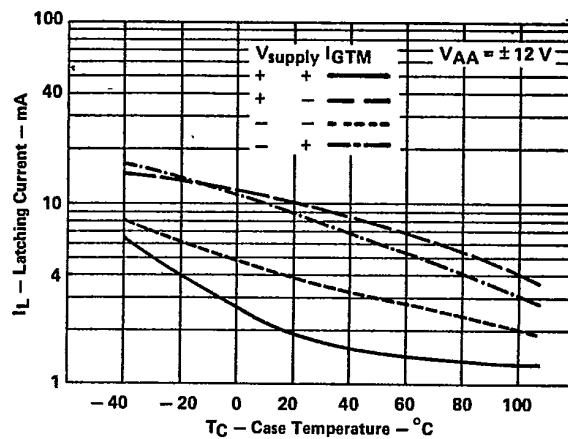


FIGURE 5

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TIC Devices