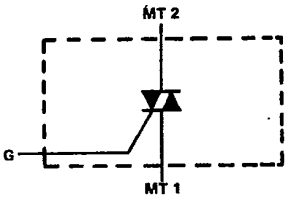
TIC216A, TIC216B, TIC216C, TIC216D, TIC216E, TIC216M, TIC216S, TIC216N SILICON TRIACS

REVISED OCTOBER 1984

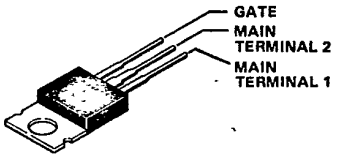
T-25-15

- Sensitive-Gate Triacs
- 100 V to 800 V
- MAX I_{GT} of 5 mA (Quadrants 1-3)

device schematic



TO-220AB PACKAGE



MAIN TERMINAL 2 IS IN ELECTRICAL CONTACT WITH THE MOUNTING TAB

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 μs)	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 60-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.

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
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) 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 μs)	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.

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

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

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

† All voltages are with respect to Main Terminal 1.

NOTES: 6. These parameters must be measured using pulse techniques, $t_w \leq 1$ 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 ampitude) pulse supplied by a generator with the following characteristics: R_G = 100 Ω, t_w = 20 μs, t_r < 15 ns, t_f ≤ 15 ns, f = 1 kHz.

thermal characteristics

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