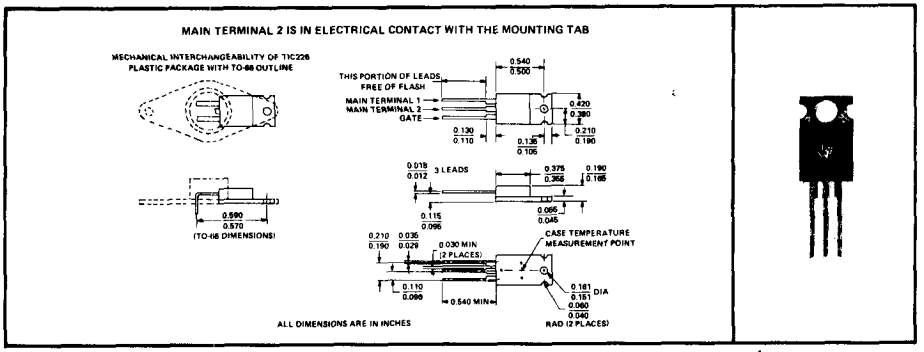
8 A RMS • 200 V and 400 V
TRIACS
for
HIGH-TEMPERATURE, HIGH-CURRENT, and HIGH-VOLTAGE APPLICATIONS
• Typ dv/dt of 500 V/μs at 25°C

description

These devices are bidirectional triode thyristors (triacs) 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.

mechanical data



absolute maximum ratings over operating case temperature range (unless otherwise noted)†

			UNIT
Repetitive Peak Off-State Voltage, V_{DRM} (See Note 1)	TIC226B	200	V
	TIC226D	400	
Full-Cycle RMS On-State Current at (or below) 85°C Case Temperature, $I_{T(RMS)}$ (See Note 2)		8	A
Peak On-State Surge Current, Full-Sine-Wave, I_{TSM} (See Note 3)		70	A
Peak On-State Surge Current, Half-Sine-Wave, I_{TSM} (See Note 4)		80	A
Peak Gate Current, I_{GM}		1	A
Peak Gate Power Dissipation, P_{GM}, at (or below) 85°C Case Temperature (Pulse Width ≤ 200 μs)		2.2	W
Average Gate Power Dissipation, $P_{G(av)}$, at (or below) 85°C Case Temperature (See Note 5)		0.9	W
Operating Case Temperature Range		−40 to 110	°C
Storage Temperature Range		−40 to 125	°C
Lead Temperature 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 to 60-Hz full-sine-wave operation with resistive load. Above 85°C derate according to Figure 2.
3. This value applies for one 60-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 16.6 ms.

†All voltage values are with respect to Main Terminal 1.

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,	$t_{p(g)} \geq 20\ \mu s$		15	50	mA
		V_{supply} = +12 V†,	R_L = 10 Ω,	$t_{p(g)} \geq 20\ \mu s$		−25	−50	
		V_{supply} = −12 V†,	R_L = 10 Ω,	$t_{p(g)} \geq 20\ \mu s$		−30	−50	
		V_{supply} = −12 V†,	R_L = 10 Ω,	$t_{p(g)} \geq 20\ \mu s$		75		
V_{GTM}	Peak Gate Trigger Voltage	V_{supply} = +12 V†,	R_L = 10 Ω,	$t_{p(g)} \geq 20\ \mu s$		0.9	2.5	V
		V_{supply} = +12 V†,	R_L = 10 Ω,	$t_{p(g)} \geq 20\ \mu s$		−1.2	−2.5	
		V_{supply} = −12 V†,	R_L = 10 Ω,	$t_{p(g)} \geq 20\ \mu s$		−1.2	−2.5	
		V_{supply} = −12 V†,	R_L = 10 Ω,	$t_{p(g)} \geq 20\ \mu s$		1.2		
V_{TM}	Peak On-State Voltage	I_{TM} = ±12 A,	I_G = 100 mA,	See Note 6			±2.1	V
I_H	Holding Current	V_{supply} = +12 V†,	I_G = 0,	Initiating I_{TM} = 500 mA		20	60	mA
		V_{supply} = −12 V†,	I_G = 0,	Initiating I_{TM} = −500 mA		−30	−60	
I_L	Latching Current	V_{supply} = +12 V†,	See Note 7			30	70	mA
		V_{supply} = −12 V†,	See Note 7			−40	−70	
dv/dt	Critical Rate of Rise of Off-State Voltage	V_{DRM} = Rated V_{DRM},	I_G = 0,	T_C = 110°C		500		V/μs
dv/dt	Critical Rate of Rise of Commutation Voltage	V_{DRM} = Rated V_{DRM}, See Figure 3	I_{TRM} = ±12 A,	T_C = 85°C,	5			V/μs

†All voltage values are with respect to Main Terminal 1.

NOTES: 6. This parameter 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 0.125 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 Ω, t_w = 20 μs, $t_r \leq 15$ ns, $t_f \leq 15$ ns, f = 1 kHz.

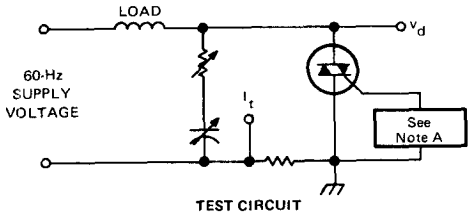
thermal characteristics

PARAMETER		MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	1.8	°C/W
$R_{\theta JA}$	Junction-to-Free-Air Thermal Resistance	62.5	

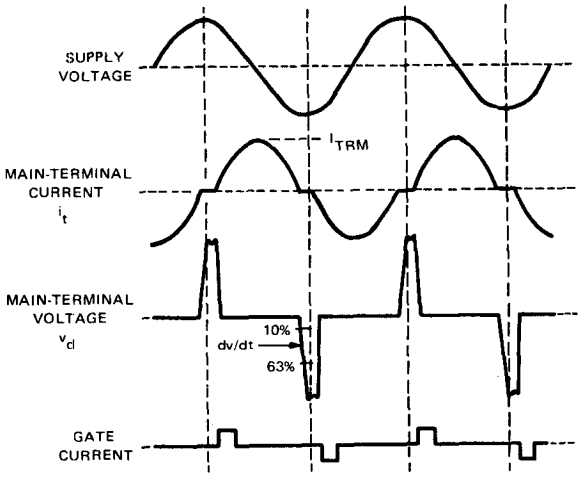
PARAMETER MEASUREMENT INFORMATION

The rate of rise of commutation voltage is defined as the slope of the line connecting the 10% and 63% test voltage points.

The critical rate of rise of commutation voltage is the rate above which the device will not sustain the off-state following conduction but will conduct current in the opposite direction in the absence of a gate-trigger signal. While this failure to switch to the off-state is not detrimental to the thyristor, it does result in loss of control of power to the load.



TEST CIRCUIT



VOLTAGE WAVEFORMS

FIGURE 1–COMMUTATING dv/dt

NOTE A: The gate-current pulse is furnished by a trigger circuit which presents essentially an open circuit between pulses. The pulse is timed so that the off-state-voltage duration is approximately 800 μs.

THERMAL INFORMATION

MAXIMUM RMS ON-STATE CURRENT
vs
CASE TEMPERATURE

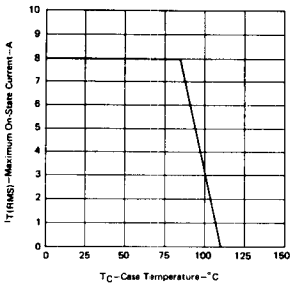


FIGURE 2

MAXIMUM AVERAGE POWER DISSIPATED
vs
RMS ON-STATE CURRENT

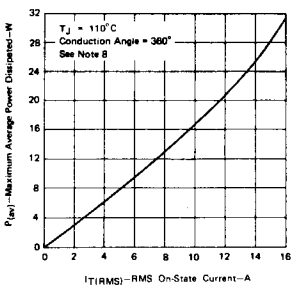


FIGURE 3

SURGE ON-STATE CURRENT
vs
CYCLES OF CURRENT DURATION

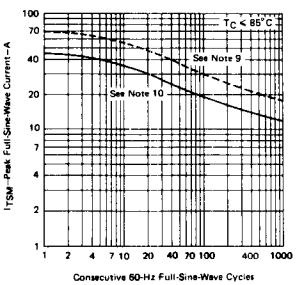


FIGURE 4

NOTES: 8. For operation at current greater than 8 amps rms, see Figure 4.
9. The dashed curve shows the maximum number of cycles of surge current recommended for safe operation provided the device is initially operating at, or below, the rated value of on-state current; however, during the surge period gate control of the device may be lost.
10. The solid curve shows the maximum number of cycles of surge current for which gate control is guaranteed provided the device is initially at nonoperating thermal equilibrium.

TYPICAL CHARACTERISTICS

PEAK GATE TRIGGER CURRENT
vs
CASE TEMPERATURE

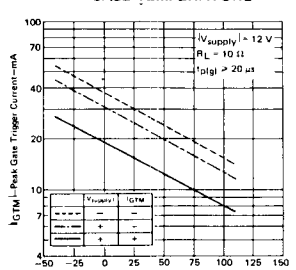


FIGURE 5

PEAK GATE TRIGGER VOLTAGE
vs
CASE TEMPERATURE

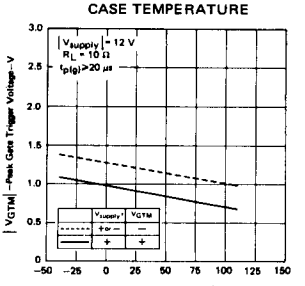


FIGURE 6

†The supply voltage is called positive when it causes Main Terminal 2 to be positive with respect to Main Terminal 1.

TEXAS INSTRUMENTS

Typ	$I_{T(RMS)}$	V_{DRM}	I_{TSM}	I_{GT} max I, II, III	I_{GT} typ. IV
type	A	V	A	mA	mA
TIC 226 B	8	200	70	50	75
TIC 226 D	8	400	70	50	75

V_{GT} max I, II, III V	V_{GT} max IV V	V_{TM} max V	@	I_{TM} A	I_H max mA	Gehäuse package
2,5		2,1		12	60	TO-66P
2,5		2,1		12	60	TO-66P