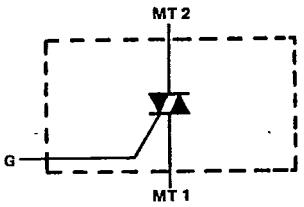
SERIES TIC253, TIC263 SILICON TRIACS

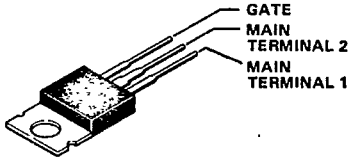
REVISED OCTOBER 1984

- High-Current Triacs
- 100 V to 800 V
- 12 A and 16 A RMS
- 100 A and 125 A Peak Current
- Max I_{GT} of 50 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)

	SUFFIX	SERIES	
		TIC253	TIC263
Repetitive peak off-state voltage, V_{DRM} (see Note 1)	A	100 V	100 V
	B	200 V	200 V
	C	300 V	300 V
	D	400 V	400 V
	E	500 V	500 V
	M	600 V	600 V
	S	700 V	700 V
	N	800 V	800 V
Full-cycle RMS on-state current at (or below) 70°C case temperature $I_{T(RMS)}$ (see Note 2)		20 A	25 A
Peak on-state surge current, full-sine-wave, I_{TSM} (see Note 3)		150 A	175 A
Peak gate current, I_{GM}		±1 A	
Operating case temperature range		−40°C to 110°C	
Storage temperature range		−40°C to 110°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 500 mW/°C for Series TIC253 and 625 mW/°C for Series TIC263.
3. This value applies for one 50-Hz full-sine-wave when the device is operating at (or below) rated values of peak reverse voltage and on-state current. Surge may be repeated after the device has returned to original thermal equilibrium.

SERIES TIC253, TIC263
SILICON TRIACS

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

PARAMETER		TEST CONDITIONS		SERIES TIC253			SERIES TIC263			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
I_{DRM}	Repetitive Peak Off-State Current	V_{DRM} = Rated V_{DRM}, T_C = 100°C	I_G = 0,			±2			±2	mA
I_{GTM}	Peak Gate Trigger Current	V_{supply} = +12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		7	50		7	50	mA
		V_{supply} = +12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		−15	−50		−15	−50	
		V_{supply} = −12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		−16	−50		−16	−50	
		V_{supply} = −12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		28			28		
V_{GTM}	Peak Gate Trigger Voltage	V_{supply} = +12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		0.7	2		0.7	2	V
		V_{supply} = +12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		−0.7	−2		−0.7	−2	
		V_{supply} = −12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		−0.8	−2		−0.8	−2	
		V_{supply} = −12 V†, $t_{w(g)} \geq 20\,\mu s$	R_L = 10 Ω,		0.8	2		0.8	2	
V_{TM}	Peak On-State Voltage	I_{TM} = ±28.2 A, See Note 4	I_G = 50 mA,		±1.4	±1.7				V
		I_{TM} = ±35.2 A, See Note 4	I_G = 50 mA,					±1.5	±1.7	
I_H	Holding Current	V_{supply} = +12 V†, Initiating I_{TM} = 100 mA	I_G = 0,		6	40		6	40	mA
		V_{supply} = −12 V†, Initiating I_{TM} = −100 mA	I_G = 0,		−13	−40		−13	−40	
I_L	Latching Current	V_{supply} = +12 V†,	See Note 5		20			20		mA
		V_{supply} = −12 V†,	See Note 5		−20			−20		
dv/dt	Critical Rate of Rise of Off-State Voltage	V_D = Rated V_D, T_C = 110°C	I_G = 0,		450			450		V/μs
dv/dt (c)	Critical Rise of Commutation Voltage	V_R = Rated V_D, di/dt = 0	T_C = 80°C,		1			1		V/μs
di/dt	Critical Rate of Rise of On-State Current	V_D = Rated V_D, dI_G/dt = 50 mA/μs,	I_{GT} = 50 mA, T_C = 110°C		200			200		A/μs

† All voltages 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 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 Ω, t_w = 20 μs, $t_r \leq 15$ ns, $t_f \leq 15$ ns, f = 1 kHz.

thermal characteristics

PARAMETER		SERIES TIC253			SERIES TIC263			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
$R_{\theta JC}$				1.52			1.22	°C/W
$R_{\theta JA}$				36			36	

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TYPICAL CHARACTERISTICS

GATE TRIGGER CURRENT
vs
CASE TEMPERATURE

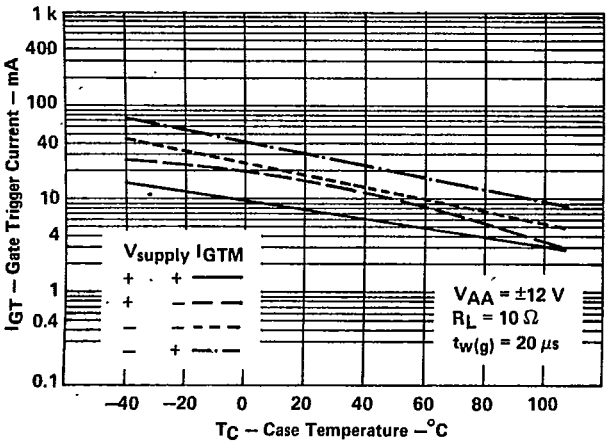

FIGURE 1

GATE TRIGGER VOLTAGE
vs
CASE TEMPERATURE

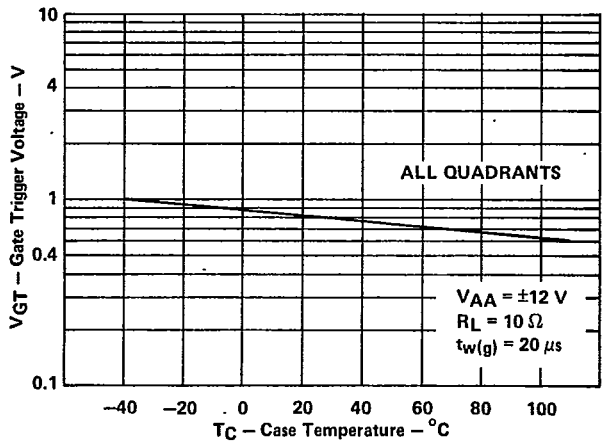

FIGURE 2

TYPICAL CHARACTERISTICS

HOLDING CURRENT
vs
CASE TEMPERATURE

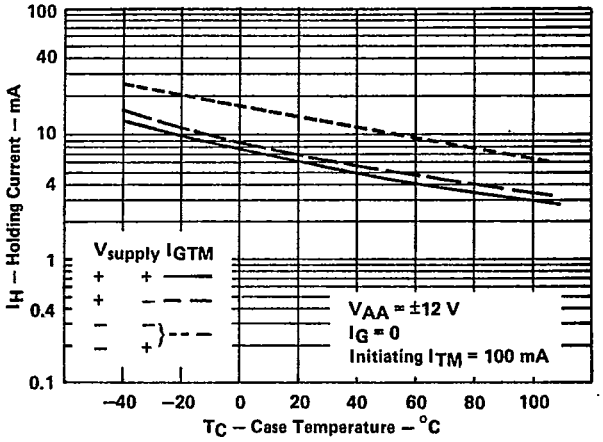

FIGURE 3

GATE FORWARD VOLTAGE
vs
GATE FORWARD CURRENT

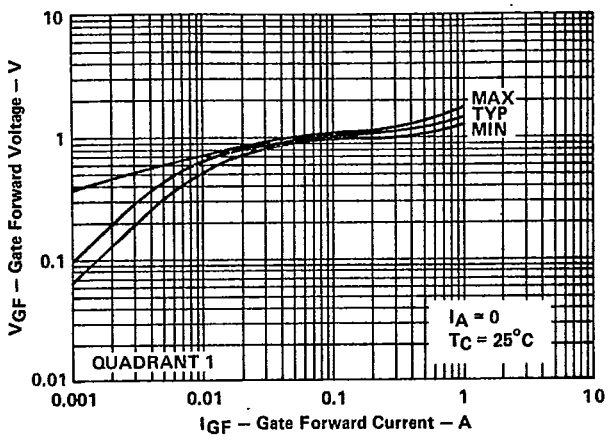

FIGURE 4

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TYPICAL CHARACTERISTICS

LATCHING CURRENT
vs
CASE TEMPERATURE

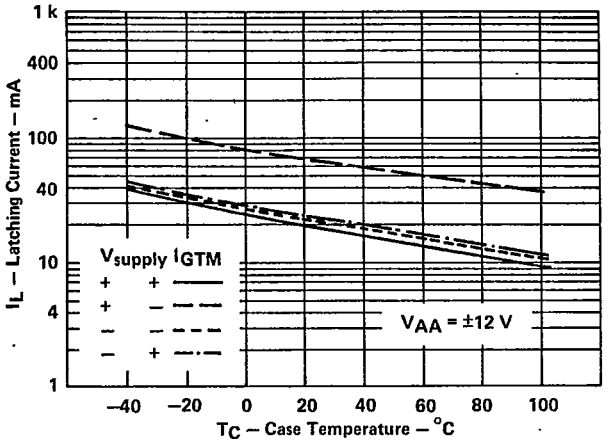

FIGURE 5