

8961726 TEXAS INSTR (OPTO)

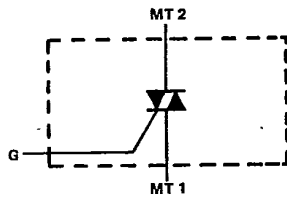
62C 36738 D

T-23-15  
 SERIES TIC253, TIC263  
 SILICON TRIACS

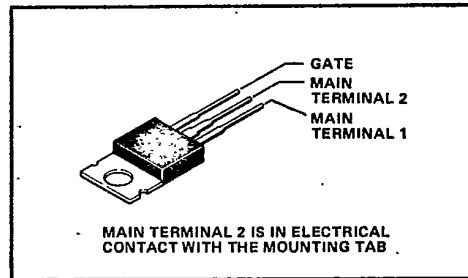
REVISED OCTOBER 1984

- High-Current Triacs
- 100 V to 800 V
- 12 A and 16 A RMS
- 100 A and 125 A Peak Current
- Max IGT of 50 mA (Quadrants 1-3)

device schematic



TO-220AB PACKAGE



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.

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TIC Devices

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62C 36739 D

T-25-15

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 <sub>DRM</sub>	Repetitive Peak Off-State Current V <sub>DRM</sub> = Rated V <sub>DRM</sub> , I <sub>G</sub> = 0, T <sub>C</sub> = 100°C	± 2			± 2			mA
I <sub>GTM</sub>	Peak Gate Trigger Current V <sub>supply</sub> = + 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	7 50			7 50			mA
	V <sub>supply</sub> = + 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	- 15 - 50			- 15 - 50			
	V <sub>supply</sub> = - 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	- 16 - 50			- 16 - 50			
	V <sub>supply</sub> = - 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	28			28			
V <sub>GTM</sub>	Peak Gate Trigger Voltage V <sub>supply</sub> = + 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	0.7 2			0.7 2			V
	V <sub>supply</sub> = + 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	- 0.7 - 2			- 0.7 - 2			
	V <sub>supply</sub> = - 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	- 0.8 - 2			- 0.8 - 2			
	V <sub>supply</sub> = - 12 V <sup>†</sup> , R <sub>L</sub> = 10 Ω, t <sub>w(g)</sub> ≥ 20 μs	0.8 2			0.8 2			
V <sub>TM</sub>	Peak On-State Voltage I <sub>TM</sub> = ± 28.2 A, I <sub>G</sub> = 50 mA, See Note 4	± 1.4 ± 1.7						V
	I <sub>TM</sub> = ± 35.2 A, I <sub>G</sub> = 50 mA, See Note 4				± 1.5 ± 1.7			
I <sub>H</sub>	Holding Current V <sub>supply</sub> = + 12 V <sup>†</sup> , I <sub>G</sub> = 0, Initiating I <sub>TM</sub> = 100 mA	6 40			6 40			mA
	V <sub>supply</sub> = - 12 V <sup>†</sup> , I <sub>G</sub> = 0, Initiating I <sub>TM</sub> = - 100 mA	- 13 - 40			- 13 - 40			
I <sub>L</sub>	Latching Current V <sub>supply</sub> = + 12 V <sup>†</sup> , See Note 5	20			20			mA
	V <sub>supply</sub> = - 12 V <sup>†</sup> , See Note 5	- 20			- 20			
dv/dt	Critical Rate of Rise of Off-State Voltage V <sub>D</sub> = Rated V <sub>D</sub> , T <sub>C</sub> = 110°C	450			450			V/μs
dv/dt (c)	Critical Rise of Commutation Voltage V <sub>R</sub> = Rated V <sub>D</sub> , di/dt = 0	1			1			V/μs
di/dt	Critical Rate of Rise of On-State Current V <sub>D</sub> = Rated V <sub>D</sub> , di <sub>G</sub> /dt = 50 mA/μs, T <sub>C</sub> = 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<sub>w</sub> ≤ 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<sub>G</sub> = 100 Ω, t<sub>w</sub> = 20 μs, t<sub>r</sub> ≤ 15 ns, t<sub>f</sub> ≤ 15 ns, f = 1 kHz.

thermal characteristics

PARAMETER	SERIES TIC253			SERIES TIC263			UNIT
	MIN	TYP	MAX	MIN	TYP	MAX	
R <sub>θJC</sub>	1.52			1.22			°C/W
R <sub>θJA</sub>	36			36			

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TIC Devices

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SERIES TIC253, TIC263  
SILICON TRIACS

T-25-15

TYPICAL CHARACTERISTICS

GATE TRIGGER CURRENT  
vs  
CASE TEMPERATURE

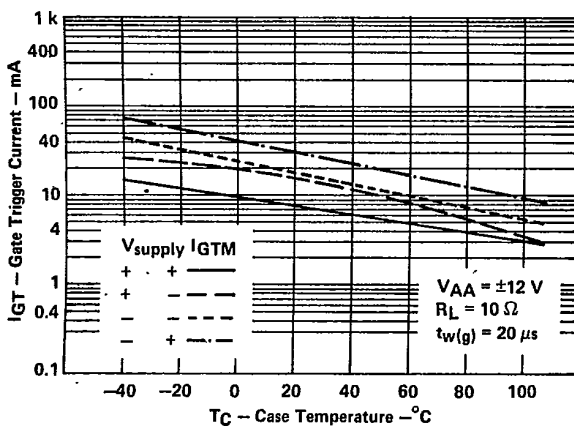


FIGURE 1

GATE TRIGGER VOLTAGE  
vs  
CASE TEMPERATURE

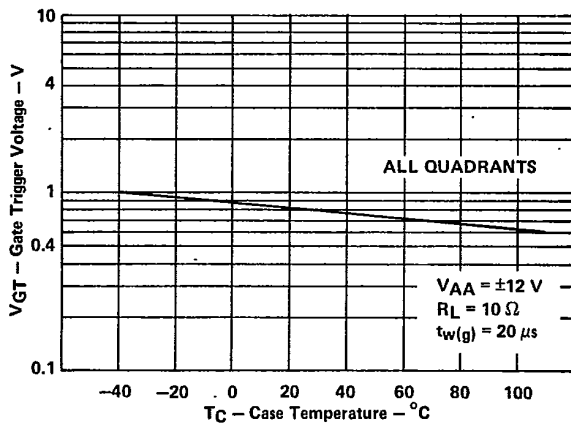


FIGURE 2

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TIC Devices

8961726 TEXAS INSTR (OPTO)

62C 36741 D

SERIES TIC253, TIC263  
SILICON TRIACS

7-25-15

TYPICAL CHARACTERISTICS

HOLDING CURRENT  
vs  
CASE TEMPERATURE

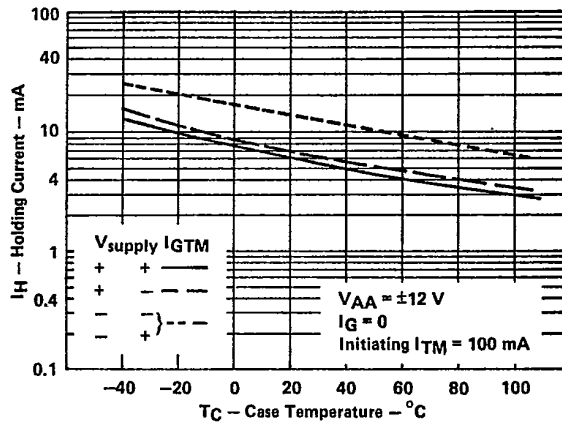


FIGURE 3

GATE FORWARD VOLTAGE  
vs  
GATE FORWARD CURRENT

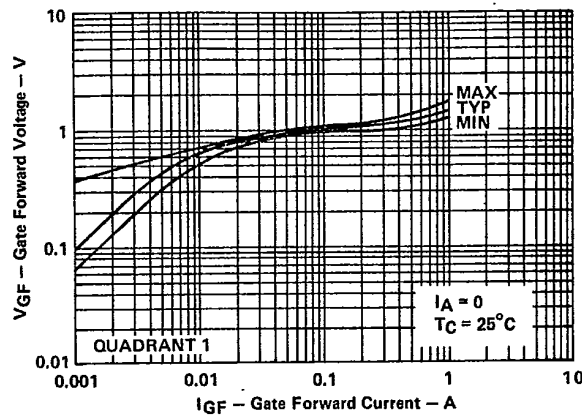


FIGURE 4

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TIC Devices

8961726 TEXAS INSTR (OPTO)

62C 36742 D

SERIES TIC253, TIC263  
SILICON TRIACS

T-25-15

TYPICAL CHARACTERISTICS

LATCHING CURRENT  
VS  
CASE TEMPERATURE

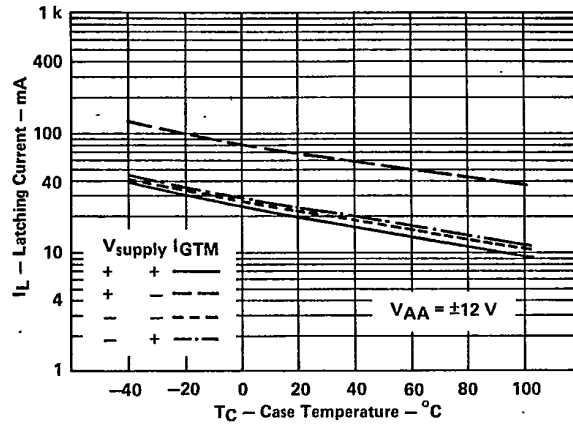


FIGURE 5

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TIC Devices

This datasheet has been downloaded from:

[www.DatasheetCatalog.com](http://www.DatasheetCatalog.com)

Datasheets for electronic components.

# Texas Instruments

<http://www.ti.com>

This file is the datasheet for the following electronic components:

TIC263S - <http://www.ti.com/product/tic263s?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253D - <http://www.ti.com/product/tic253d?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253A - <http://www.ti.com/product/tic253a?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253B - <http://www.ti.com/product/tic253b?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253C - <http://www.ti.com/product/tic253c?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC263A - <http://www.ti.com/product/tic263a?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC263N - <http://www.ti.com/product/tic263n?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC263M - <http://www.ti.com/product/tic263m?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC263E - <http://www.ti.com/product/tic263e?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC263D - <http://www.ti.com/product/tic263d?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC263C - <http://www.ti.com/product/tic263c?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253S - <http://www.ti.com/product/tic253s?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253N - <http://www.ti.com/product/tic253n?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253M - <http://www.ti.com/product/tic253m?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC253E - <http://www.ti.com/product/tic253e?HQS=TI-null-null-dscatalog-df-pf-null-wwe>

TIC263B - <http://www.ti.com/product/tic263b?HQS=TI-null-null-dscatalog-df-pf-null-wwe>