- High Current Triacs
- 20 A RMS
- Glass Passivated Wafer
- 400 V to 800 V Off-State Voltage
- 150 A Peak Current
- Max I<sub>GT</sub> of 50 mA (Quadrants 1 3)



# SOT-93 PACKAGE (TOP VIEW) MT1 1 MT2 2 3

Pin 2 is in electrical contact with the mounting base.

MDC2ADA

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

RATING			VALUE	UNIT
	TIC253D		400	
Repetitive peak off-state voltage (see Note 1)	TIC253M	M	600	V
	TIC253S	$V_{DRM}$	700	V
	TIC253N		800	
Full-cycle RMS on-state current at (or below) 70°C case temperature (see Note 2)			20	Α
Peak on-state surge current full-sine-wave at (or below) 25°C case temperature (see Note 3)			150	Α
Peak gate current			±1	Α
Operating case temperature range			-40 to +110	°C
Storage temperature range			-40 to +125	°C
Lead temperature 1.6 mm 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 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 peak reverse volta ge and on-state current. Surge may be repeated after the device has returned to original thermal equilibrium.

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

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
I <sub>DRM</sub>	Repetitive peak off-state current	V <sub>D</sub> = Rated V <sub>DRM</sub>	I <sub>G</sub> = 0	T <sub>C</sub> = 110°C			±2	mA
I <sub>GT</sub>	<b>0</b>	$V_{\text{supply}} = +12 \text{ V}^{\dagger}$	$R_L = 10 \Omega$	t <sub>p(g)</sub> > 20 μs		15	50	mA
	Gate trigger current	$V_{\text{supply}} = +12 \text{ V}^{\dagger}$ $V_{\text{supply}} = -12 \text{ V}^{\dagger}$	$R_L = 10 \Omega$ $R_L = 10 \Omega$	$t_{p(g)} > 20 \mu s$ $t_{p(g)} > 20 \mu s$		-30 -20	-50 -50	
		$V_{\text{supply}} = -12 \text{ V}\dagger$	$R_L = 10 \Omega$	$t_{p(g)} > 20 \mu s$		32		
V <sub>GT</sub>		$V_{\text{supply}} = +12 \text{ V}^{\dagger}$	$R_L = 10 \Omega$	t <sub>p(g)</sub> > 20 μs		0.8	2	V
	Gate trigger	$V_{\text{supply}} = +12 \text{ V}^{\dagger}$	$R_L = 10 \Omega$	$t_{p(g)} > 20 \mu s$		-0.8	-2	
	voltage	$V_{\text{supply}} = -12 \text{ V}^{\dagger}$	$R_L = 10 \Omega$	$t_{p(g)} > 20 \mu s$		-0.8	-2	
		$V_{\text{supply}} = -12 \text{ V}\dagger$	$R_L = 10 \Omega$	t <sub>p(g)</sub> > 20 μs		0.8	2	
V <sub>T</sub>	On-state voltage	I <sub>T</sub> = ±28.2 A	$I_G = 50 \text{ mA}$	(see Note 4)		±1.4	±1.7	V

<sup>†</sup> All voltages are with respect to Main Terminal 1.

NOTE 4: This parameter must be measured using pulse techniques, t<sub>p</sub> = ≤ 1 ms, duty cycle ≤ 2 %. Voltage-sensing contacts separate from the current carrying contacts are located within 3.2 mm from the device body.

# PRODUCT INFORMATION



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

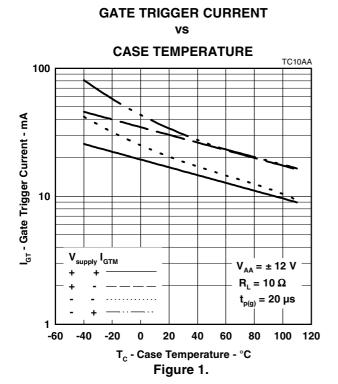
	PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
1	Holding current	V <sub>supply</sub> = +12 V†	I <sub>G</sub> = 0	Init' I <sub>T</sub> = 100 mA		20	40	mA
'н	riolaling current	$V_{\text{supply}} = -12 \text{ V}\dagger$	$I_G = 0$	Init' $I_T = -100 \text{ mA}$		-10	-40	ША
	Latching current	$V_{\text{supply}} = +12 \text{ V}^{\dagger}$	(see Note 5)		20		mA	
'L		$V_{\text{supply}} = -12 \text{ V}\dagger$	(366 11016 3)		-20		IIIA	
dv/dt	Critical rate of rise of	V <sub>D</sub> = Rated V <sub>D</sub>	I <sub>G</sub> = 0	T <sub>C</sub> = 110°C		±450		V/µs
uv/ut	off-state voltage							
dv/dt	Critical rise of	$V_D = Rated V_D$		$T_C = 80^{\circ}C$		±1		V/µs
dv/dt <sub>(c)</sub>	commutation voltage	$di/dt = 0.5 I_{T(RMS)}/ms$		$I_T = 1.4 I_{T(RMS)}$		Ξ1		ν/μ5
di/dt	Critical rate of rise of	$V_D = Rated V_D$	I <sub>GT</sub> = 50 mA	T <sub>C</sub> = 110°C		±100		A/µs
	on -state current	di <sub>G</sub> /dt = 50 mA/μs		1C = 110 O		±100		Α/μδ

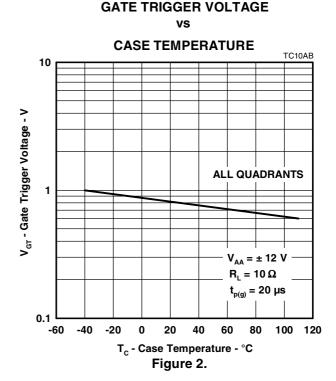
<sup>†</sup> All voltages are with respect to Main Terminal 1.

# thermal characteristics

	PARAMETER		MIN	TYP	MAX	UNIT
ſ	$R_{\theta JC}$	Junction to case thermal resistance			1.52	°C/W
	$R_{\theta JA}$	Junction to free air thermal resistance			36	°C/W

# **TYPICAL CHARACTERISTICS**





# PRODUCT INFORMATION

NOTE 5: The triacs are triggered by a 15-V (open-circuit amplitude) pulse supplied by a generator with the following characteristics:  $R_G = 100 \ \Omega$ ,  $t_{p(g)} = 20 \ \mu s$ ,  $t_r = \le 15 \ ns$ ,  $t_r = 1 \ kHz$ .

# **TYPICAL CHARACTERISTICS**

