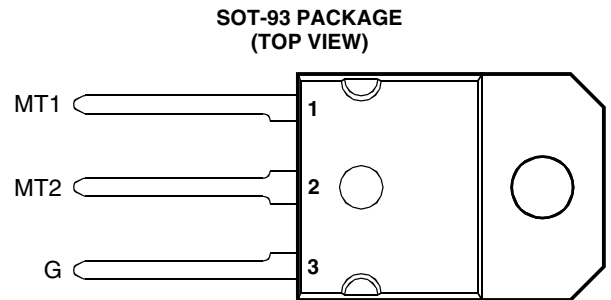**BOURNS**®

- **High Current Triacs**
- **20 A RMS**
- **Glass Passivated Wafer**
- **400 V to 800 V Off-State Voltage**
- **150 A Peak Current**
- **Max I_{GT} of 50 mA (Quadrants 1 - 3)**

SOT-93 PACKAGE
(TOP VIEW)

MT1 — 1
MT2 — 2
G — 3

Pin 2 is in electrical contact with the mounting base.

MDC2ADA

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

RATING		SYMBOL	VALUE	UNIT
Repetitive peak off-state voltage (see Note 1)	TIC253D	V_{DRM}	400	V
	TIC253M		600	
	TIC253S		700	
	TIC253N		800	
Full-cycle RMS on-state current at (or below) 70°C case temperature (see Note 2)		$I_{T(RMS)}$	20	A
Peak on-state surge current full-sine-wave at (or below) 25°C case temperature (see Note 3)		I_{TSM}	150	A
Peak gate current		I_{GM}	±1	A
Operating case temperature range		T_C	-40 to +110	°C
Storage temperature range		T_{stg}	-40 to +125	°C
Lead temperature 1.6 mm from case for 10 seconds		T_L	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 voltage 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_{DRM}	Repetitive peak off-state current	V_D = Rated V_{DRM}	I_G = 0	T_C = 110°C			±2	mA
I_{GT}	Gate trigger current	V_{supply} = +12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		15	50	mA
		V_{supply} = +12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		-30	-50	
		V_{supply} = -12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		-20	-50	
		V_{supply} = -12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		32		
V_{GT}	Gate trigger voltage	V_{supply} = +12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		0.8	2	V
		V_{supply} = +12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		-0.8	-2	
		V_{supply} = -12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		-0.8	-2	
		V_{supply} = -12 V†	R_L = 10 Ω	$t_{p(g)}$ > 20 μs		0.8	2	
V_T	On-state voltage	I_T = ±28.2 A	I_G = 50 mA	(see Note 4)		±1.4	±1.7	V

† All voltages are with respect to Main Terminal 1.
NOTE 4: This parameter must be measured using pulse techniques, t_p = ≤ 1 ms, duty cycle ≤ 2 %. Voltage-sensing contacts separate from the current carrying contacts are located within 3.2 mm from the device body.

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

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
I_H	Holding current	V_{supply} = +12 V†	I_G = 0	Init' I_T = 100 mA		20	40	mA
		V_{supply} = -12 V†	I_G = 0	Init' I_T = -100 mA		-10	-40	
I_L	Latching current	V_{supply} = +12 V†	(see Note 5)			20		mA
		V_{supply} = -12 V†				-20		
dv/dt	Critical rate of rise of off-state voltage	V_D = Rated V_D	I_G = 0	T_C = 110°C		±450		V/µs
dv/dt$_{(c)}$	Critical rise of commutation voltage	V_D = Rated V_D di/dt = 0.5 $I_{T(RMS)}$/ms		T_C = 80°C I_T = 1.4 $I_{T(RMS)}$		±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		±100		A/µs

† All voltages are with respect to Main Terminal 1.
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 Ω, $t_{p(g)}$ = 20 µs, t_r = ≤ 15 ns, f = 1 kHz.

thermal characteristics

PARAMETER		MIN	TYP	MAX	UNIT
$R_{θJC}$	Junction to case thermal resistance			1.52	°C/W
$R_{θJA}$	Junction to free air thermal resistance			36	°C/W

TYPICAL CHARACTERISTICS

GATE TRIGGER CURRENT
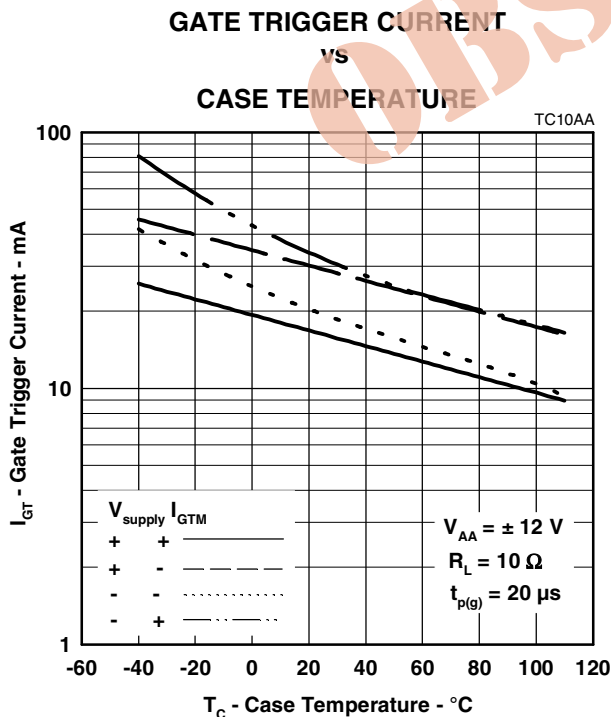**vs**
CASE TEMPERATURE

TC10AA

Figure 1.

GATE TRIGGER VOLTAGE
vs
CASE TEMPERATURE

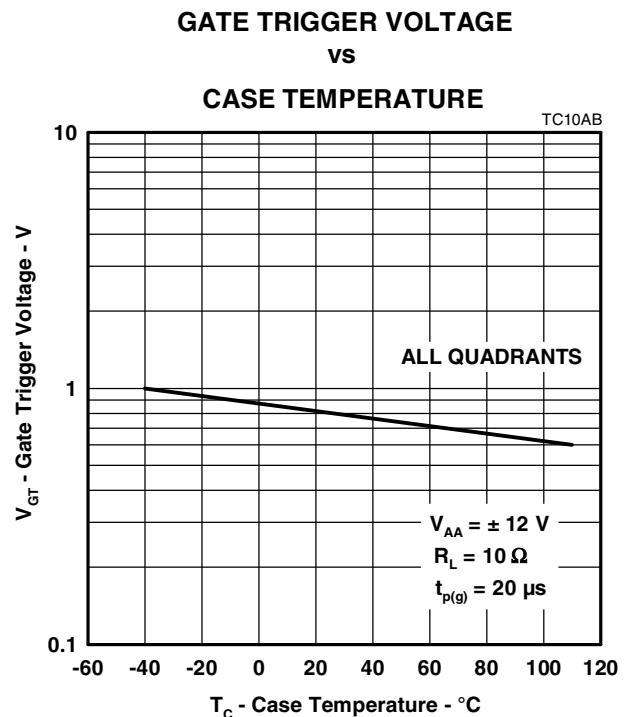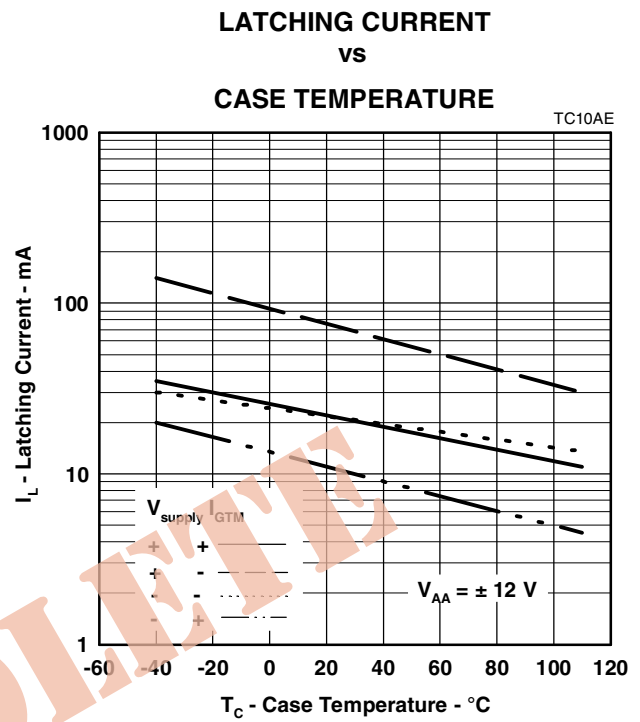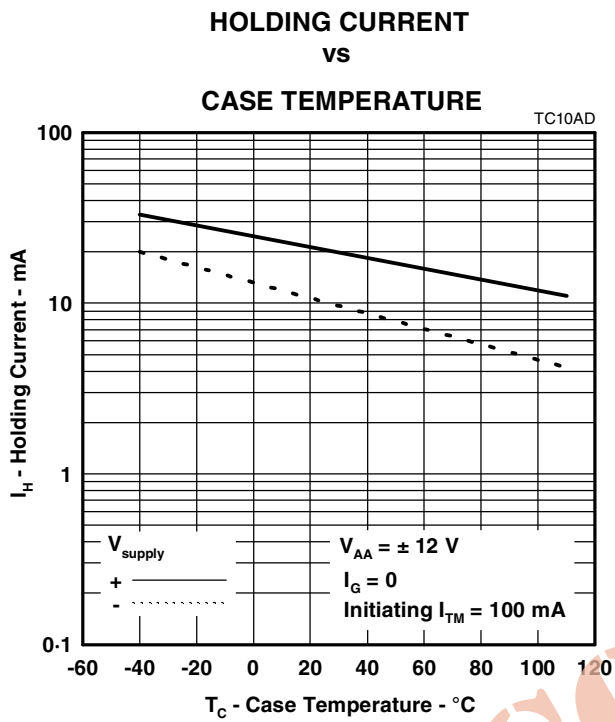TC10AB

Figure 2.

PRODUCT INFORMATION

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TYPICAL CHARACTERISTICS

HOLDING CURRENT
vs
CASE TEMPERATURE

TC10AD

I_H - Holding Current - mA

V_{supply}

$+$ ———

$-$ ·········

$V_{AA} = \pm 12$ V
$I_G = 0$
Initiating $I_{TM} = 100$ mA

T_C - Case Temperature - °C

Figure 3.

LATCHING CURRENT
vs
CASE TEMPERATURE

TC10AE

I_L - Latching Current - mA

V_{supply} I_{GTM}

$+$ $+$

$+$ $-$

$-$ $-$

$-$ $+$

$V_{AA} = \pm 12$ V

T_C - Case Temperature - °C

Figure 4.

P R O D U C T   I N F O R M A T I O N

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