

Three quadrant triacs high commutation

BTA208B series B

GENERAL DESCRIPTION

Glass passivated high commutation triacs in a plastic envelope suitable for surface mounting, intended for use in circuits where high static and dynamic dV/dt and high dI/dt can occur. These devices will commute the full rated rms current at the maximum rated junction temperature, without the aid of a snubber.

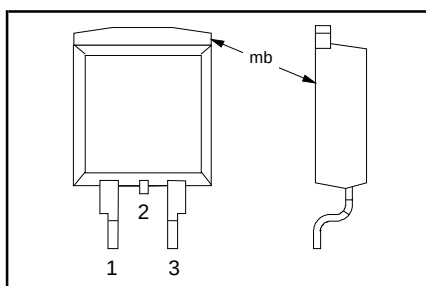
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
V_{DRM}	BTA208B- Repetitive peak off-state voltages	500B 500	600B 600	800B 800	V
$I_{T(RMS)}$	RMS on-state current	8	8	8	A
I_{TSM}	Non-repetitive peak on-state current	65	65	65	A

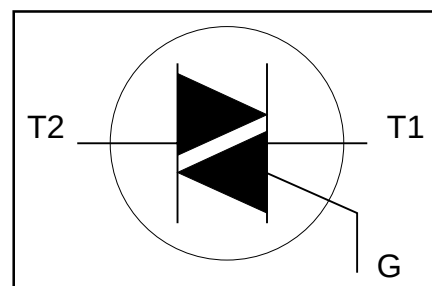
PINNING - SOT404

PIN	DESCRIPTION
1	main terminal 1
2	main terminal 2
3	gate
mb	main terminal 2

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
V_{DRM}	Repetitive peak off-state voltages		-	-500 500 ¹	-600 600 ¹	-800 800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 102^\circ\text{C}$	-	8			A
I_{TSM}	Non-repetitive peak on-state current	full sine wave; $T_j = 25^\circ\text{C}$ prior to surge	-	65			A
I^2t	I^2t for fusing	$t = 20\text{ ms}$	-	71			A
dI_T/dt	Repetitive rate of rise of on-state current after triggering	$t = 16.7\text{ ms}$	-	21			A ² s
I_{GM}	Peak gate current	$t = 10\text{ ms}$	-	100			A/ μs
V_{GM}	Peak gate voltage	$I_{TM} = 12\text{ A}; I_G = 0.2\text{ A}; dI_G/dt = 0.2\text{ A}/\mu\text{s}$	-	2			A
P_{GM}	Peak gate power		-	5			V
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.5			W
T_{stg}	Storage temperature		-40	150			$^\circ\text{C}$
T_j	Operating junction temperature		-	125			$^\circ\text{C}$

1 Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed 6 A/ μs .

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THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base	full cycle	-	-	2.0	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	half cycle minimum footprint, FR4 board	-	-	2.4	K/W
			-	55	-	K/W

STATIC CHARACTERISTICS

$T_j = 25\ ^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{GT}	Gate trigger current ²	$V_D = 12\ \text{V}$; $I_T = 0.1\ \text{A}$				
		T2+ G+	2	18	50	mA
		T2+ G-	2	21	50	mA
		T2- G-	2	34	50	mA
I_L	Latching current	$V_D = 12\ \text{V}$; $I_{GT} = 0.1\ \text{A}$				
		T2+ G+	-	31	60	mA
		T2+ G-	-	34	90	mA
		T2- G-	-	30	60	mA
I_H	Holding current	$V_D = 12\ \text{V}$; $I_{GT} = 0.1\ \text{A}$	-	31	60	mA
V_T	On-state voltage	$I_T = 10\ \text{A}$	-	1.3	1.65	V
V_{GT}	Gate trigger voltage	$V_D = 12\ \text{V}$; $I_T = 0.1\ \text{A}$	-	0.7	1.5	V
		$V_D = 400\ \text{V}$; $I_T = 0.1\ \text{A}$; $T_j = 125\ ^\circ\text{C}$	0.25	0.4	-	V
I_D	Off-state leakage current	$V_D = V_{DRM(max)}$; $T_j = 125\ ^\circ\text{C}$	-	0.1	0.5	mA

DYNAMIC CHARACTERISTICS

$T_j = 25\ ^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
dV_D/dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}$; $T_j = 125\ ^\circ\text{C}$; exponential waveform; gate open circuit	1000	4000	-	V/ μs
dI_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\ \text{V}$; $T_j = 125\ ^\circ\text{C}$; $I_{T(RMS)} = 8\ \text{A}$; without snubber; gate open circuit	-	14	-	A/ms
t_{gt}	Gate controlled turn-on time	$I_{TM} = 12\ \text{A}$; $V_D = V_{DRM(max)}$; $I_G = 0.1\ \text{A}$; $dI_G/dt = 5\ \text{A}/\mu\text{s}$	-	2	-	μs

² Device does not trigger in the T2-, G+ quadrant.

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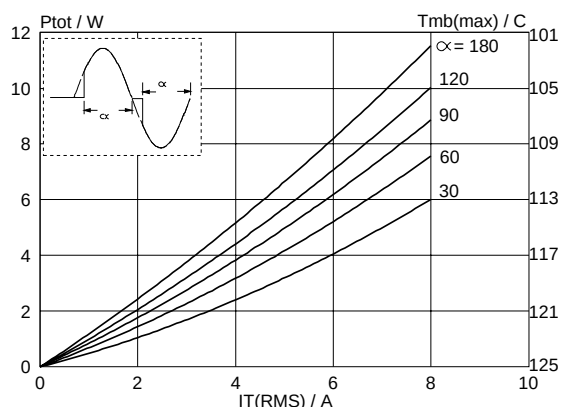


Fig.1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

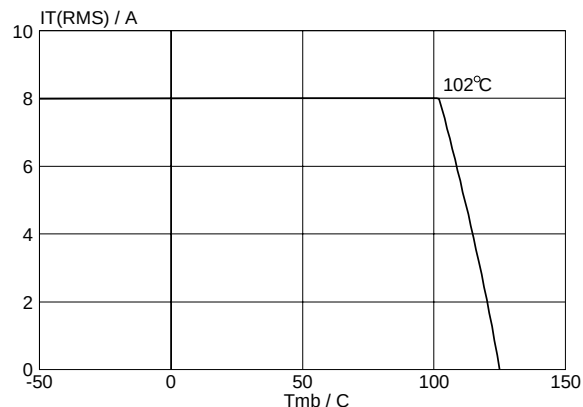


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

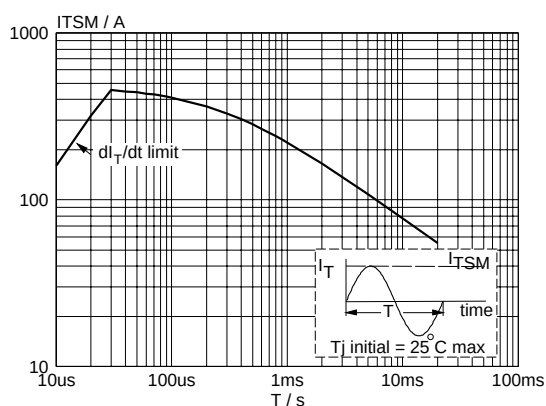


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \leq 20$ ms.

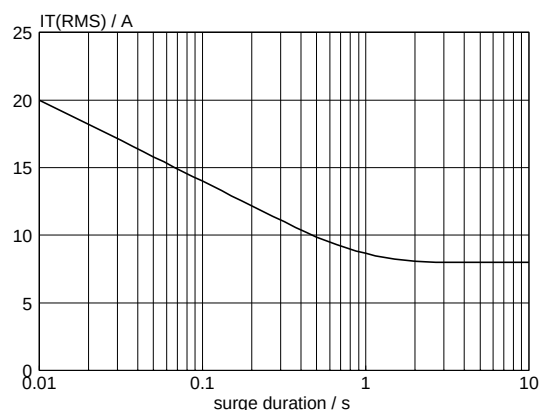


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50$ Hz; $T_{mb} \leq 102^\circ\text{C}$.

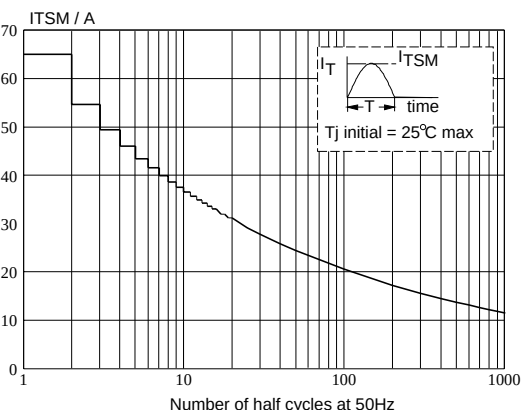


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50$ Hz.

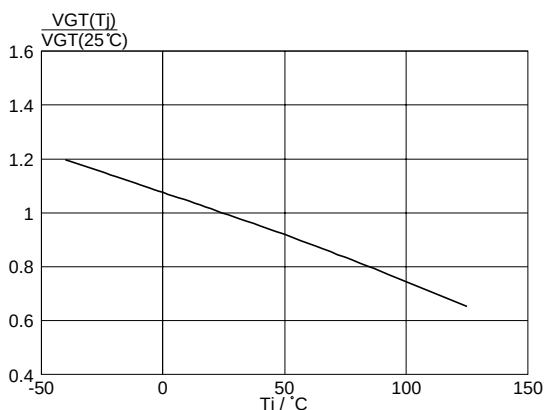
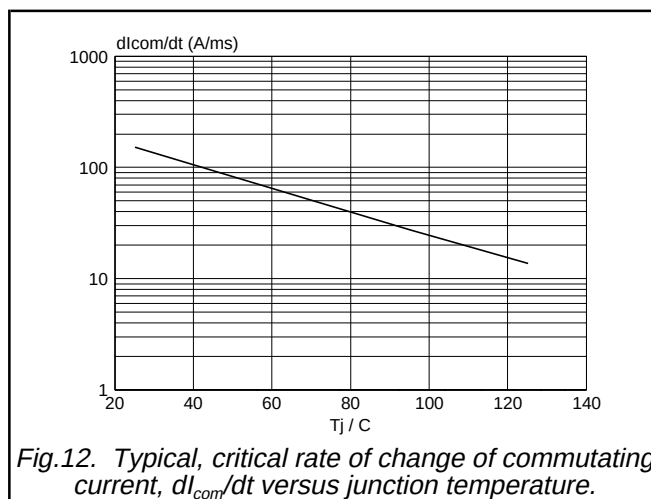
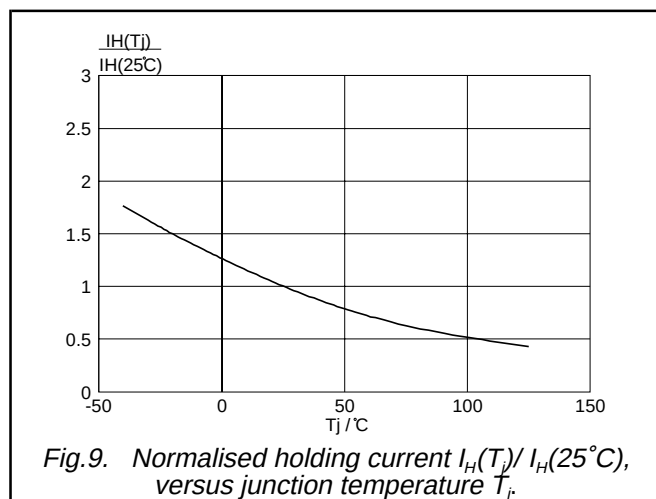
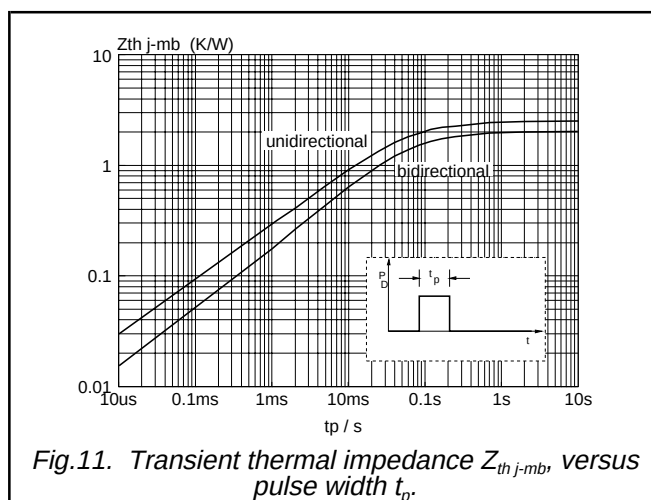
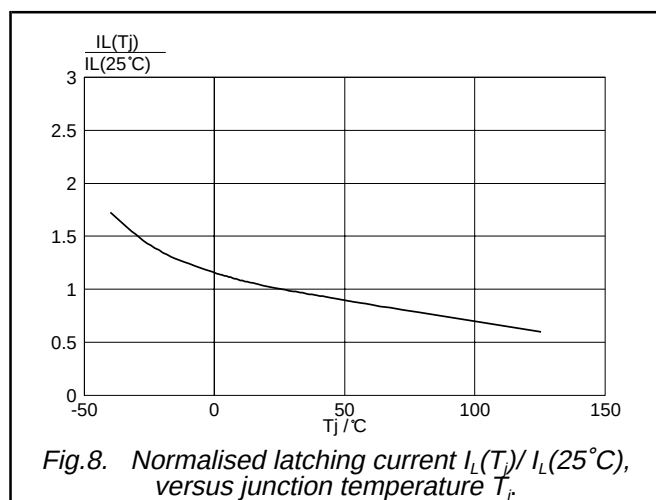
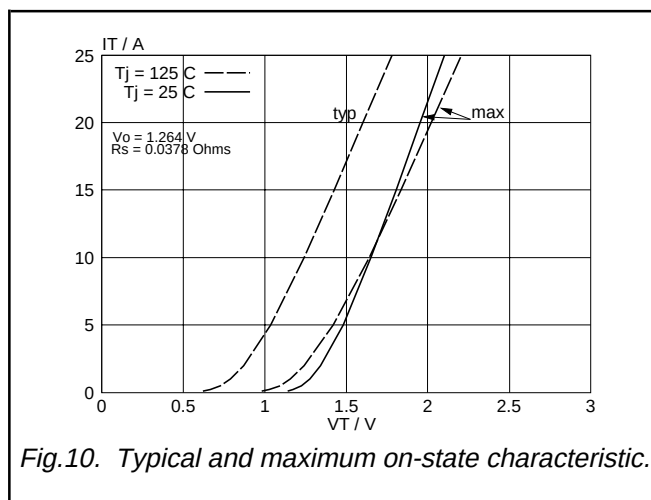
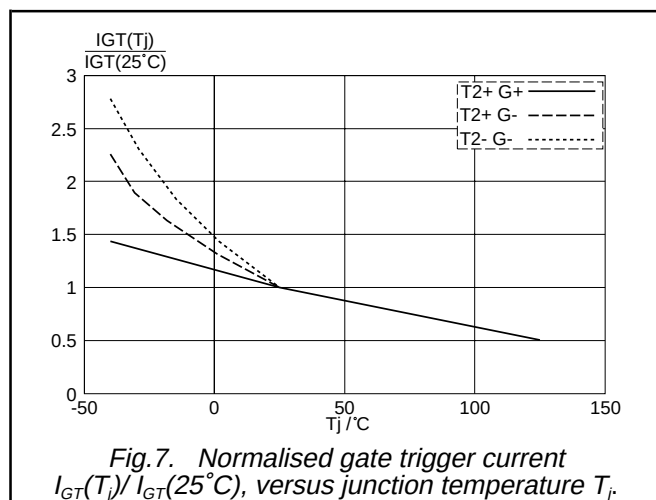


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25^\circ\text{C})$, versus junction temperature T_j .

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MECHANICAL DATA

Dimensions in mm

Net Mass: 1.4 g

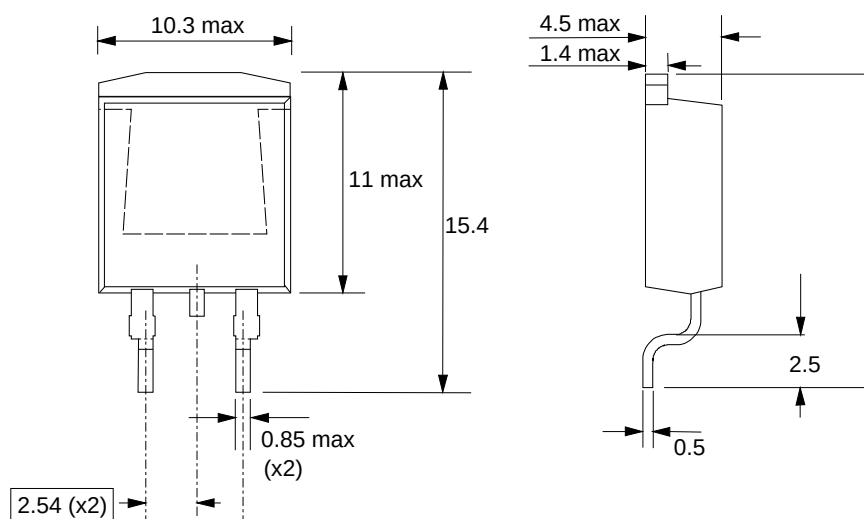


Fig.13. SOT404 : centre pin connected to mounting base.

Notes

1. Epoxy meets UL94 V0 at 1/8".

MOUNTING INSTRUCTIONS

Dimensions in mm

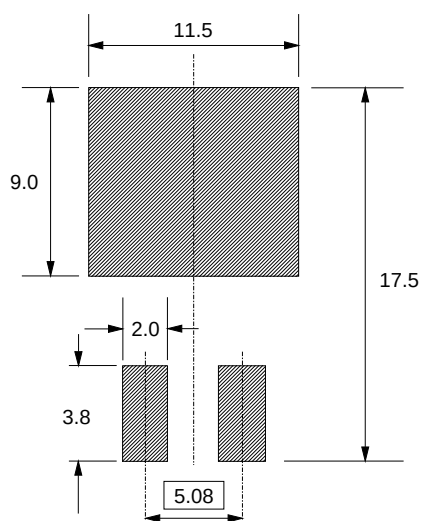


Fig.14. SOT404 : minimum pad sizes for surface mounting.

Notes

1. Plastic meets UL94 V0 at 1/8".