

## 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 dl/dt can occur. These devices will commutate the full rated rms current at the maximum rated junction temperature, without the aid of a snubber.

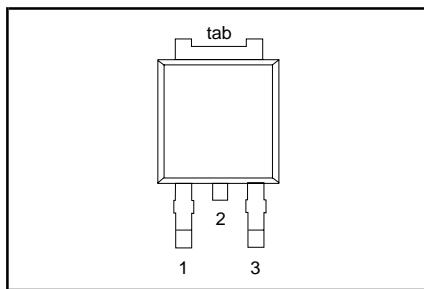
## PINNING - SOT428

PIN NUMBER	Standard S	Alternative M
1	MT1	gate
2	MT2	MT2
3	gate	MT1
tab	MT2	MT2

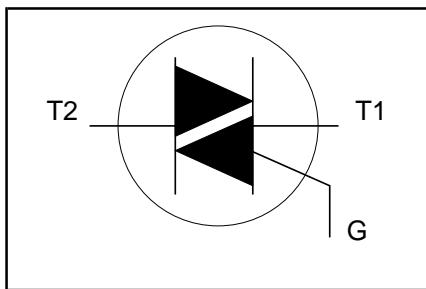
## QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
$V_{DRM}$	BTA208S (or BTA208M)-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

## 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 <sup>1</sup>	-600 600 <sup>1</sup>	-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					
$I^2t$ $dl_T/dt$	$I^2t$ for fusing Repetitive rate of rise of on-state current after triggering	$t = 20\text{ ms}$ $t = 16.7\text{ ms}$ $t = 10\text{ ms}$ $I_{TM} = 12\text{ A}; I_G = 0.2\text{ A};$ $dl_G/dt = 0.2\text{ A}/\mu\text{s}$	- - - -	65 71 21 100			A A A <sup>2</sup> s A/ $\mu\text{s}$
$I_{GM}$ $V_{GM}$ $P_{GM}$ $P_{G(AV)}$	Peak gate current Peak gate voltage Peak gate power Average gate power	over any 20 ms period	- - - -	2 5 5 0.5			A V W W
$T_{stg}$ $T_j$	Storage temperature Operating junction temperature		-40 -	150 125			°C °C

<sup>1</sup> 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/ $\mu\text{s}$ .

## THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base	full cycle	-	-	2.0	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	half cycle pcb (FR4) mounted; footprint as in Fig.14	-	75	2.4	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 <sup>2</sup>	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$				
		T2+ G+ T2+ G- T2- G-	2	18	50	mA
$I_L$	Latching current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$				
		T2+ G+ T2+ G- T2- G-	2	21	50	mA
$I_H$	Holding current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$				
$V_T$	On-state voltage	$I_T = 10\text{ A}$				
$V_{GT}$	Gate trigger voltage	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$				
$I_D$	Off-state leakage current	$V_D = 400\text{ V}; I_T = 0.1\text{ A}; T_j = 125^\circ\text{C}$	0.25	0.4	-	V
		$V_D = V_{DRM(max)}; T_j = 125^\circ\text{C}$	-	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/ $\mu\text{s}$
$dl_{com}/dt$	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	$I_{TM} = 12\text{ A}; V_D = V_{DRM(max)}; I_G = 0.1\text{ A};$ $dl_G/dt = 5\text{ A}/\mu\text{s}$	-	2	-	$\mu\text{s}$

<sup>2</sup> Device does not trigger in the T2-, G+ quadrant.

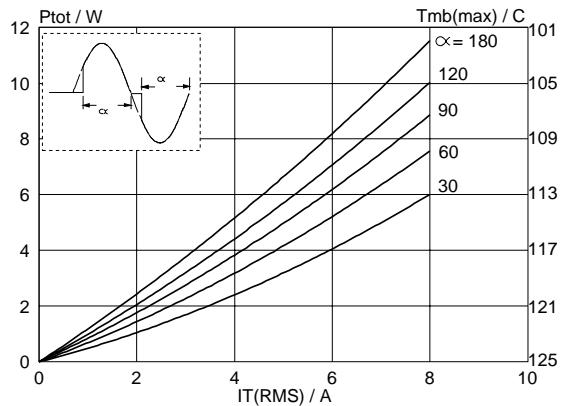


Fig.1. Maximum on-state dissipation,  $P_{tot}$ , versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha$  = conduction angle.

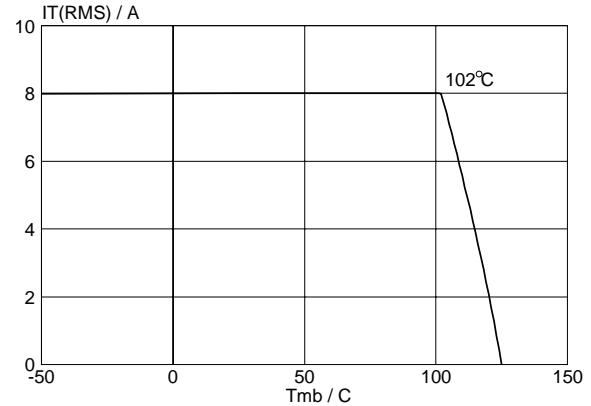


Fig.4. Maximum permissible rms current  $I_{T(RMS)}$ , versus mounting base temperature  $T_{mb}$ .

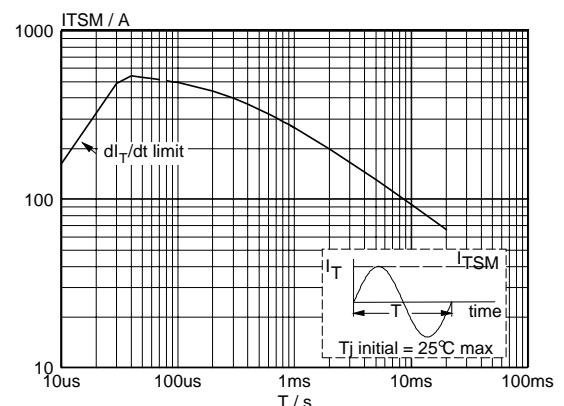


Fig.2. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus pulse width  $t_p$ , for sinusoidal currents,  $t_p \leq 20\text{ms}$ .

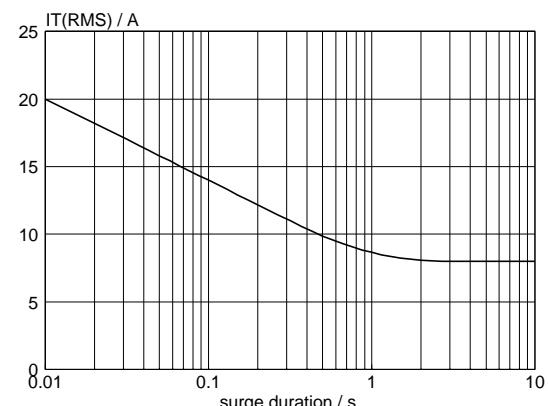


Fig.5. Maximum permissible repetitive rms on-state current  $I_{T(RMS)}$ , versus surge duration, for sinusoidal currents,  $f = 50\text{ Hz}$ ;  $T_{mb} \leq 102^\circ\text{C}$ .

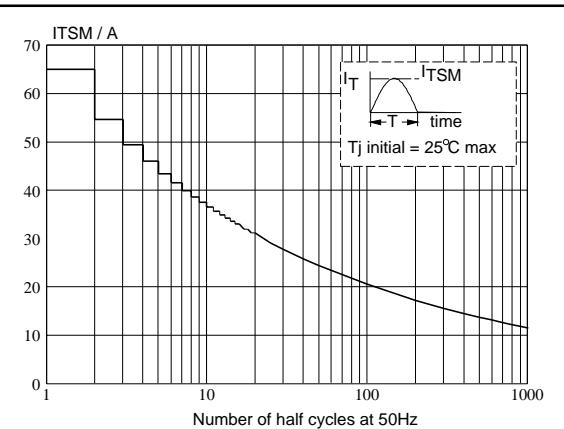


Fig.3. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f = 50\text{ Hz}$ .

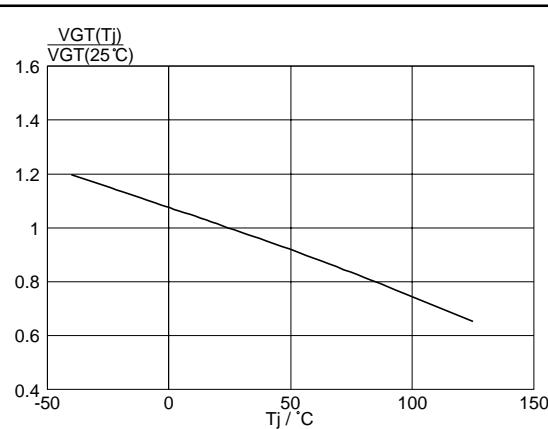


Fig.6. Normalised gate trigger voltage  $V_{GT}(T_j)/V_{GT}(25^\circ\text{C})$ , versus junction temperature  $T_j$ .

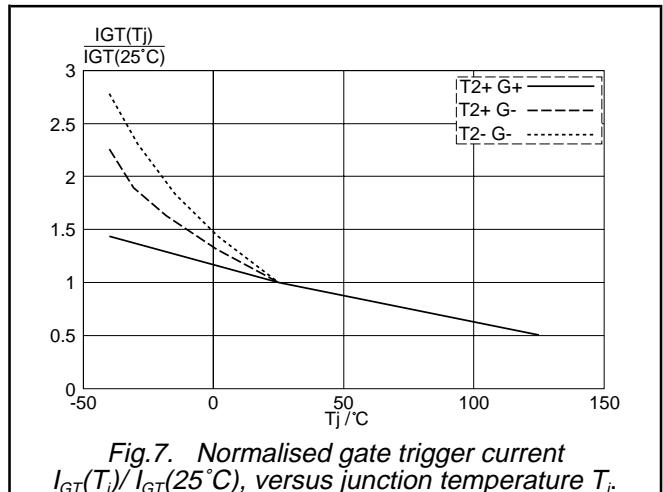


Fig.7. Normalised gate trigger current  $I_{GT}(T_j)/I_{GT}(25^\circ C)$ , versus junction temperature  $T_j$ .

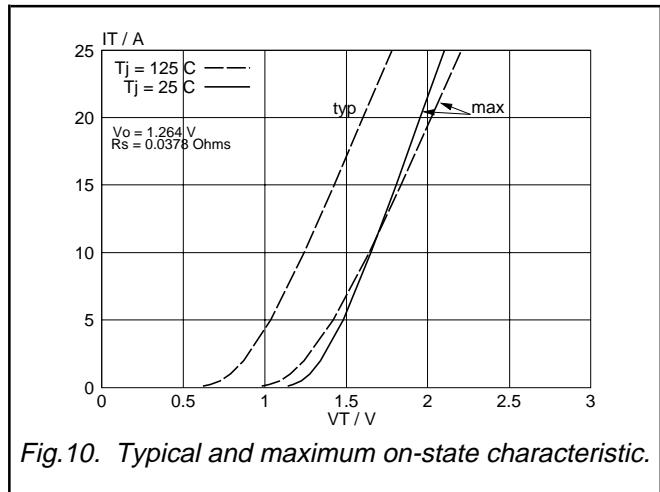


Fig.10. Typical and maximum on-state characteristic.

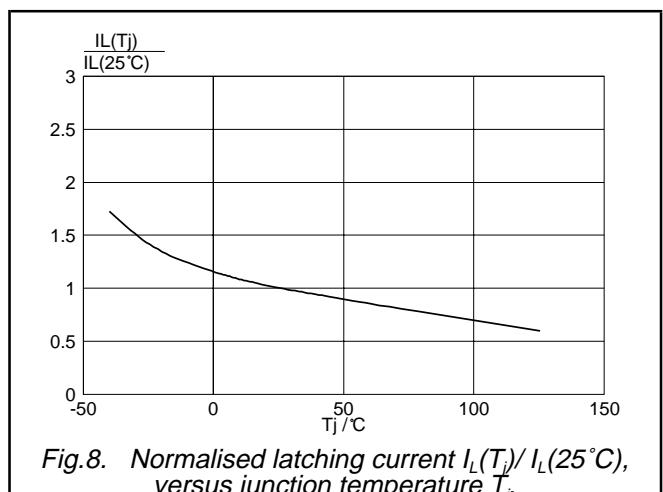


Fig.8. Normalised latching current  $I_L(T_j)/I_L(25^\circ C)$ , versus junction temperature  $T_j$ .

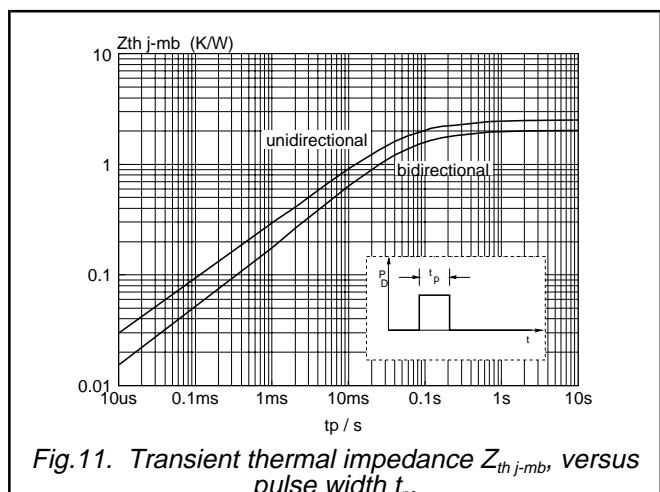


Fig.11. Transient thermal impedance  $Z_{th,j-mb}$ , versus pulse width  $t_p$ .

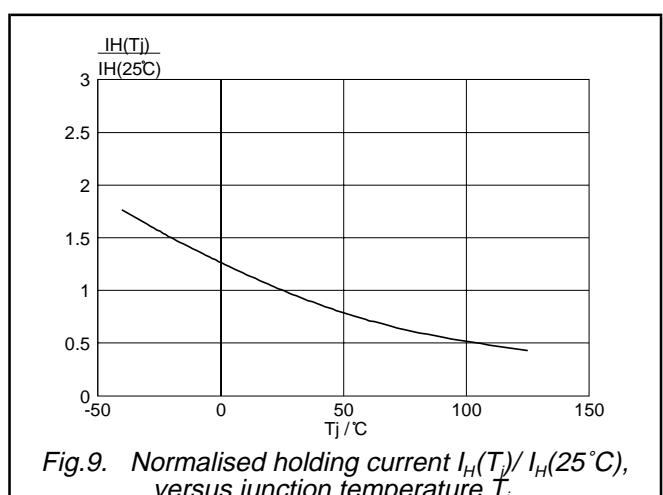


Fig.9. Normalised holding current  $I_H(T_j)/I_H(25^\circ C)$ , versus junction temperature  $T_j$ .

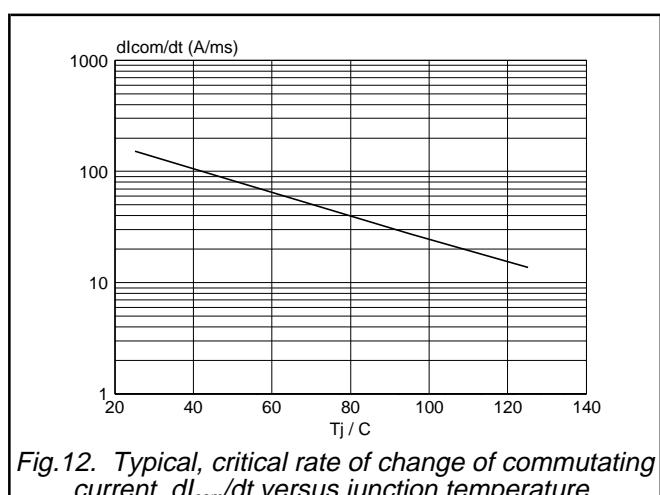


Fig.12. Typical, critical rate of change of commutating current,  $dl_{com}/dt$  versus junction temperature.

## MECHANICAL DATA

Dimensions in mm

Net Mass: 1.1 g

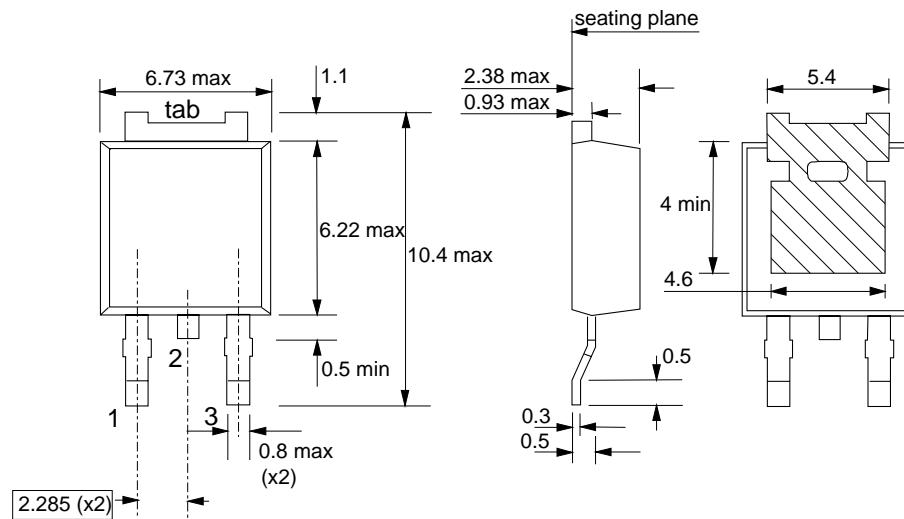


Fig.13. SOT428 : centre pin connected to tab.

## MOUNTING INSTRUCTIONS

Dimensions in mm

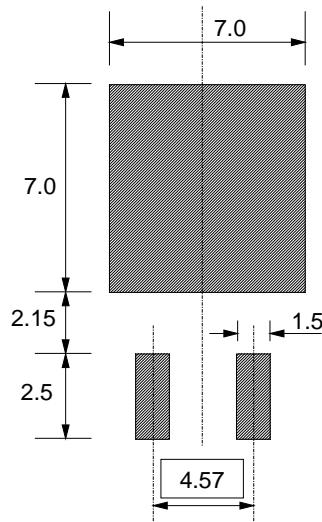


Fig.14. SOT428 : minimum pad sizes for surface mounting.

### Notes

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