

## 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 commutate the full rated rms current at the maximum rated junction temperature, without the aid of a snubber.

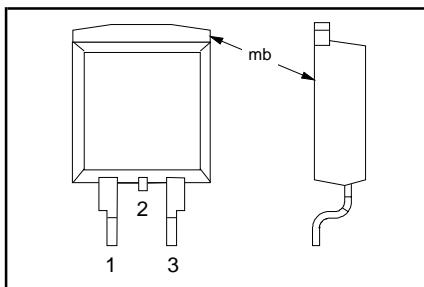
## QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
$V_{DRM}$	BTA225B- Repetitive peak off-state voltages	500B 500	600B 600	800B 800	V
$I_{T(RMS)}$	RMS on-state current	25	25	25	A
$I_{TSM}$	Non-repetitive peak on-state current	180	180	180	A

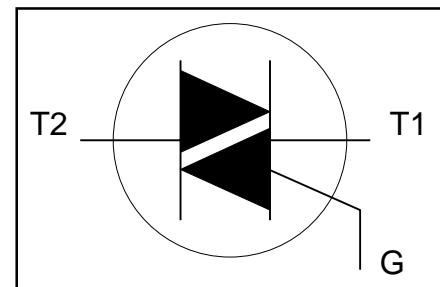
## PINNING - TO263

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 <sup>1</sup>	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 91^\circ\text{C}$	-	600 <sup>1</sup> 600	A
$I_{TSM}$	Non-repetitive peak on-state current	full sine wave; $T_j = 25^\circ\text{C}$ prior to surge $t = 20\text{ ms}$ $t = 16.7\text{ ms}$	-	25	
$I^2t$ $dl_T/dt$	$I^2t$ for fusing Repetitive rate of rise of on-state current after triggering	$t = 10\text{ ms}$ $I_{TM} = 30\text{ A}; I_G = 0.2\text{ A};$ $dl_G/dt = 0.2\text{ A}/\mu\text{s}$	-	190 209 180 100	A <sup>2</sup> s A <sup>2</sup> /μs
$I_{GM}$	Peak gate current		-	2	A
$V_{GM}$	Peak gate voltage		-	5	V
$P_{GM}$	Peak gate power		-	5	W
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.5	W
$T_{stg}$	Storage temperature		-40	150	°C
$T_j$	Operating junction temperature		-	125	°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 15 A/μs.

## **THERMAL RESISTANCES**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base	full cycle half cycle	-	-	1.0	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	minimum footprint, FR4 board	-	55	-	K/W

## STATIC CHARACTERISTICS

T<sub>i</sub> = 25 °C unless otherwise stated

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{GT}$	Gate trigger current <sup>2</sup>	$V_D = 12 \text{ V}$ ; $I_T = 0.1 \text{ A}$				
			$T2+ G+$	2	18	50
			$T2+ G-$	2	21	50
			$T2- G-$	2	34	50
$I_L$	Latching current	$V_D = 12 \text{ V}$ ; $I_{GT} = 0.1 \text{ A}$				
			$T2+ G+$	-	31	60
			$T2+ G-$	-	34	90
			$T2- G-$	-	30	60
$I_H$	Holding current	$V_D = 12 \text{ V}$ ; $I_{GT} = 0.1 \text{ A}$	-	31	60	mA
$V_T$	On-state voltage	$I_T = 30 \text{ A}$	-	1.2	1.55	V
$V_{GT}$	Gate trigger voltage	$V_D = 12 \text{ V}$ ; $I_T = 0.1 \text{ A}$	-	0.7	1.5	V
$I_D$	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<sub>i</sub> = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$dV_D/dt$	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}$ ; $T_j = 125^\circ C$ ; exponential waveform; gate open circuit	1000	4000	-	V/ $\mu$ s
$dl_{com}/dt$	Critical rate of change of commutating current	$V_{DM} = 400 V$ ; $T_j = 125^\circ C$ ; $I_{T(RMS)} = 25 A$ ; without snubber; gate open circuit	-	44	-	A/ms
$t_{gt}$	Gate controlled turn-on time	$I_{TM} = 30 A$ ; $V_D = V_{DRM(max)}$ ; $I_G = 0.1 A$ ; $dl_G/dt = 5 A/\mu s$	-	2	-	$\mu$ s

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

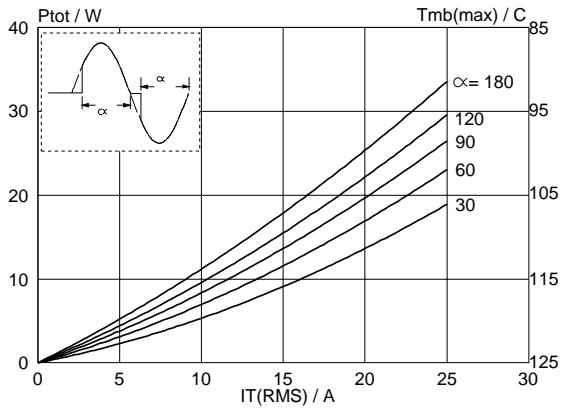


Fig.1. Maximum on-state dissipation,  $P_{tot}$ , versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha$  = conduction angle.

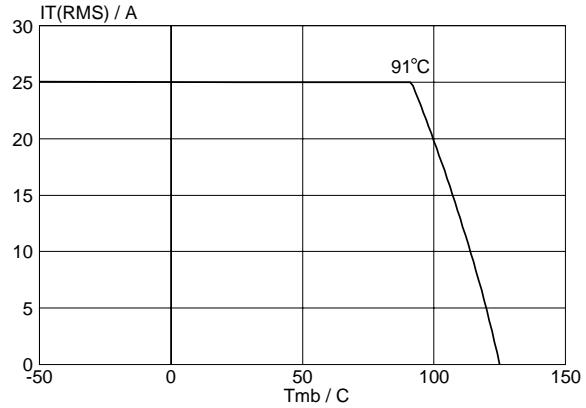


Fig.4. Maximum permissible rms current  $I_{T(RMS)}$ , versus mounting base temperature  $T_{mb}$ .

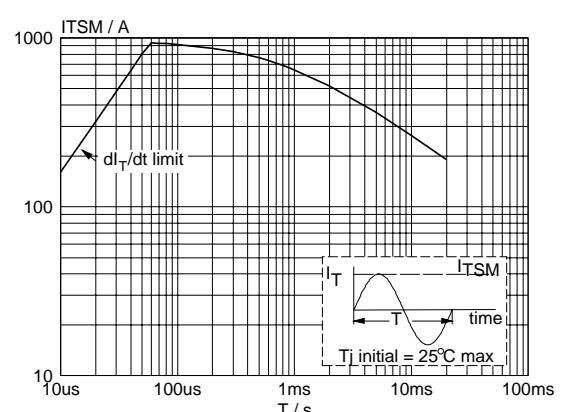


Fig.2. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus pulse width  $t_p$ , for sinusoidal currents,  $t_p \leq 20\text{ms}$ .

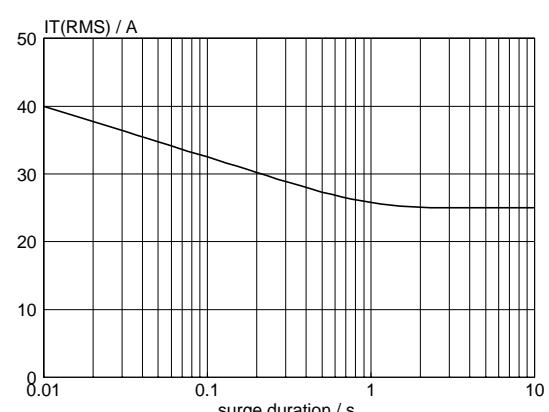


Fig.5. Maximum permissible repetitive rms on-state current  $I_{T(RMS)}$ , versus surge duration, for sinusoidal currents,  $f = 50\text{ Hz}$ ;  $T_{mb} \leq 91^\circ\text{C}$ .

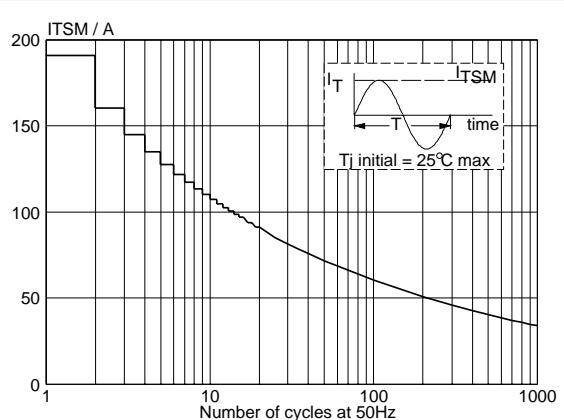


Fig.3. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f = 50\text{ Hz}$ .

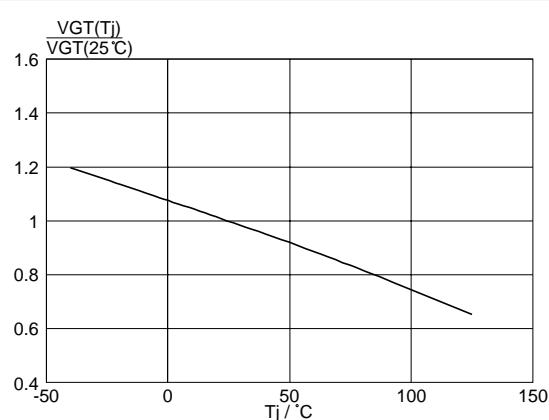


Fig.6. Normalised gate trigger voltage  $V_{GT}(T_j)/V_{GT}(25^\circ\text{C})$ , versus junction temperature  $T_j$ .

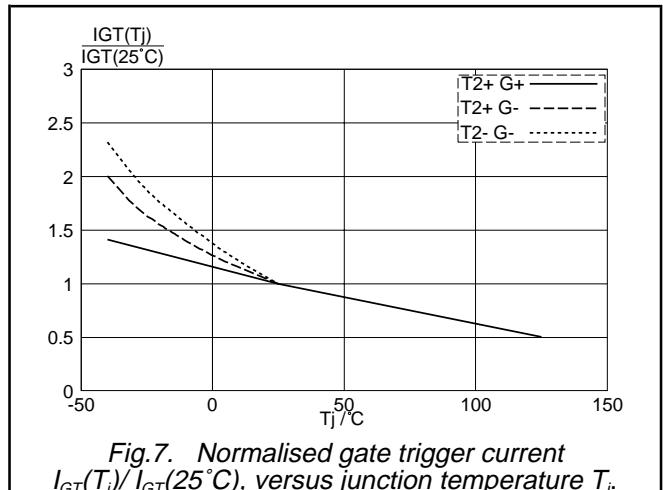


Fig.7. Normalised gate trigger current  $I_{GT}(T_j)/I_{GT}(25^\circ C)$ , versus junction temperature  $T_j$ .

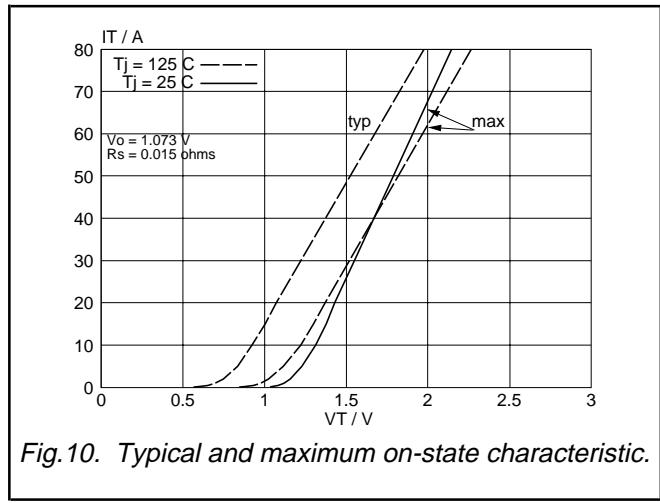


Fig.10. Typical and maximum on-state characteristic.

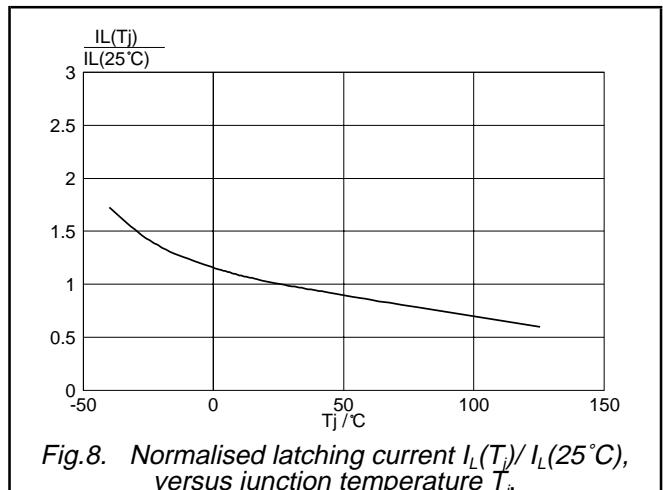


Fig.8. Normalised latching current  $I_L(T_j)/I_L(25^\circ C)$ , versus junction temperature  $T_j$ .

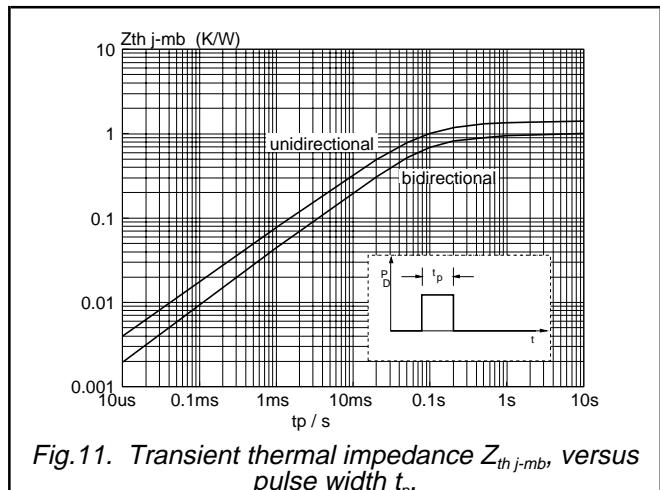


Fig.11. Transient thermal impedance  $Z_{th,j-mb}$ , versus pulse width  $t_p$ .

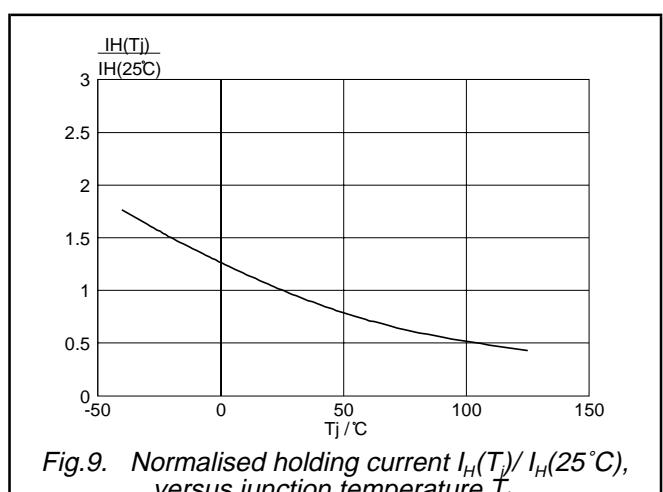


Fig.9. Normalised holding current  $I_H(T_j)/I_H(25^\circ C)$ , versus junction temperature  $T_j$ .

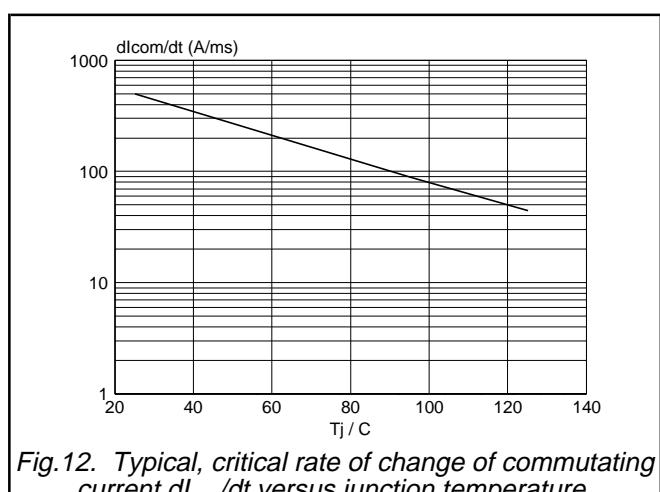


Fig.12. Typical, critical rate of change of commutating current  $dl_{com}/dt$  versus junction temperature.

## MECHANICAL DATA

Dimensions in mm

Net Mass: 1.4 g

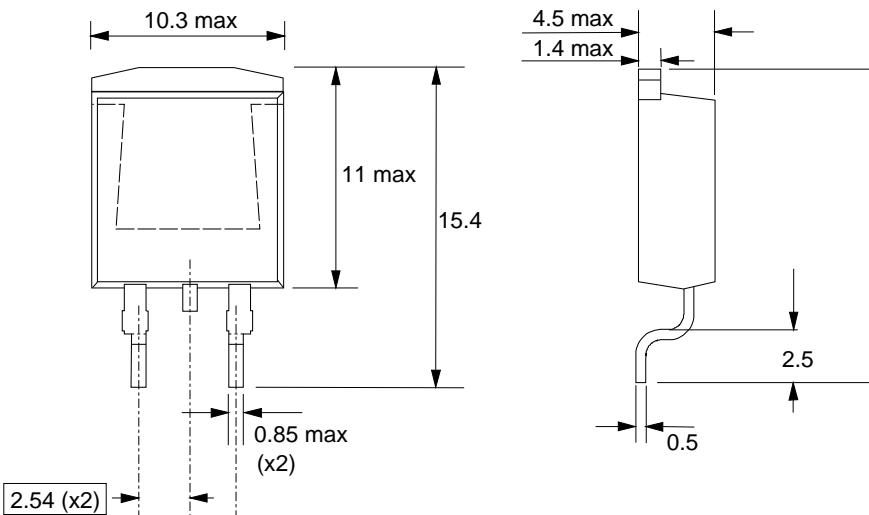


Fig.13. TO263 : centre pin connected to mounting base.

### Notes

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

## MOUNTING INSTRUCTIONS

Dimensions in mm

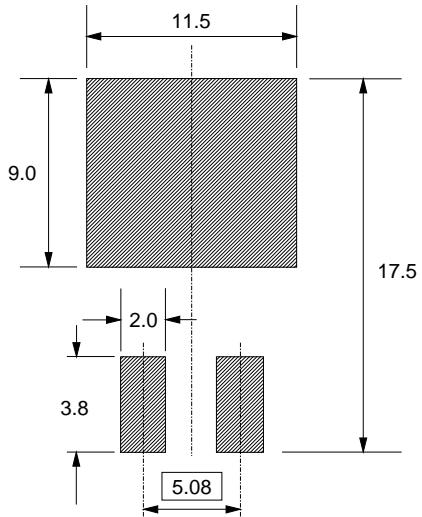


Fig.14. TO263 : minimum pad sizes for surface mounting.

### Notes

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