

GENERAL DESCRIPTION

Passivated guaranteed commutation triacs in a plastic envelope suitable for surface mounting, intended for use in motor control circuits or with other highly inductive loads. These devices balance the requirements of commutation performance and gate sensitivity. The "sensitive gate" E series and "logic level" D series are intended for interfacing with low power drivers, including micro controllers.

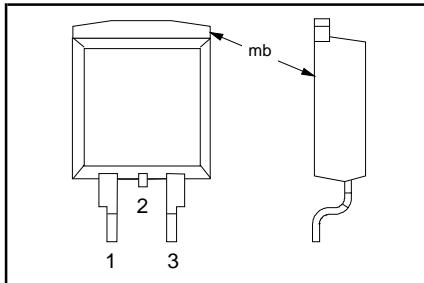
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	UNIT
V_{DRM}	BTA216B- BTA216B- BTA216B-	600D 600E 600F	- 800E 800F	V
$I_{T(RMS)}$	Repetitive peak off-state voltages	600	800	A
I_{TSM}	RMS on-state current	16	16	A
	Non-repetitive peak on-state current	140	140	A

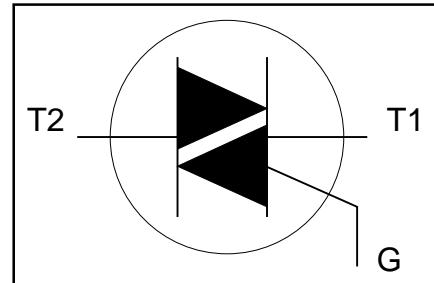
PINNING - TO263

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		-	-600 600 ¹	-800 800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 99^\circ\text{C}$	-	16		A
I_{TSM}	Non-repetitive peak on-state current	full sine wave; $T_j = 25^\circ\text{C}$ prior to surge $t = 20\text{ ms}$ $t = 16.7\text{ ms}$ $t = 10\text{ ms}$ $I_{TM} = 20\text{ A}; I_G = 0.2\text{ A};$ $dI_G/dt = 0.2\text{ A}/\mu\text{s}$	- - - - - -	140 150 98 100		A A A ² s A/ μs
I^2t dI_T/dt	I^2t for fusing Repetitive rate of rise of on-state current after triggering			2		A
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	-	5 5 0.5		V W W
T_{stg} T_j	Storage temperature Operating junction temperature		-40 -	150 125		°C °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 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	-	-	1.2 1.7	K/W K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	minimum footprint, FR4 board	-	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	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$ $T_2+ G+$ $T_2+ G-$ $T_2- G-$	-	...D	...D	...E	...F	mA	
			-	1.3	5	10	25		
			-	2.6	5	10	25		
I_L	Latching current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$ $T_2+ G+$ $T_2+ G-$ $T_2- G-$	-	10.2	15	25	30	mA	
			-	11.3	25	30	40		
			-	19.3	25	30	40		
I_H	Holding current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$	-	8	15	25	30	mA	
			...D, E, F						
			-	1.2		1.5			
V_T V_{GT}	On-state voltage Gate trigger voltage	$I_T = 20\text{ A}$ $V_D = 12\text{ V}; I_T = 0.1\text{ A}$ $V_D = 400\text{ V}; I_T = 0.1\text{ A};$ $T_j = 125^\circ\text{C}$	-	0.7		1.5		V	
			0.25	0.4		-			
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	$V_{DM} = 67\% V_{DRM(max)}$; $T_j = 110^\circ\text{C}$; exponential waveform; gate open circuit	...D	...E	...F	...D	-	V/ μs
			30	60	70	65	-	
			2.5	4.7	9.5	7.5	-	
dl_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\text{ V}; T_j = 110^\circ\text{C}$; $I_{T(RMS)} = 16\text{ A}$; $dV_{com}/dt = 20\text{V}/\mu\text{s}$; gate open circuit	12	40	50	100	-	A/ms
			12	40	50	100	-	
			...D, E, F					
t_{gt}	Gate controlled turn-on time	$I_{TM} = 20\text{ A}; V_D = V_{DRM(max)}$; $I_G = 0.1\text{ A}; dl_G/dt = 5\text{ A}/\mu\text{s}$	-	-	-	2	-	μs
			-	-	-	2	-	

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

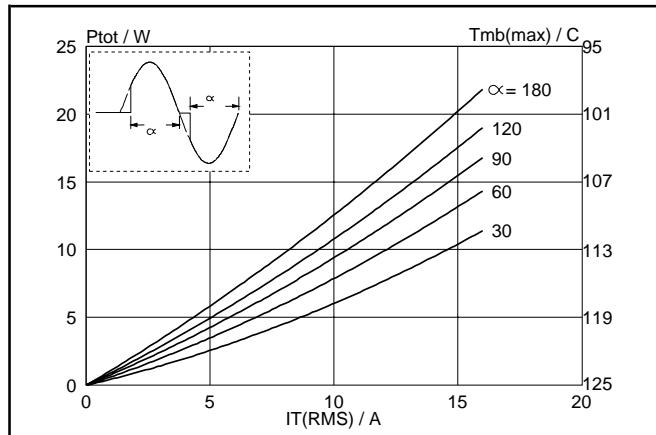


Fig.1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

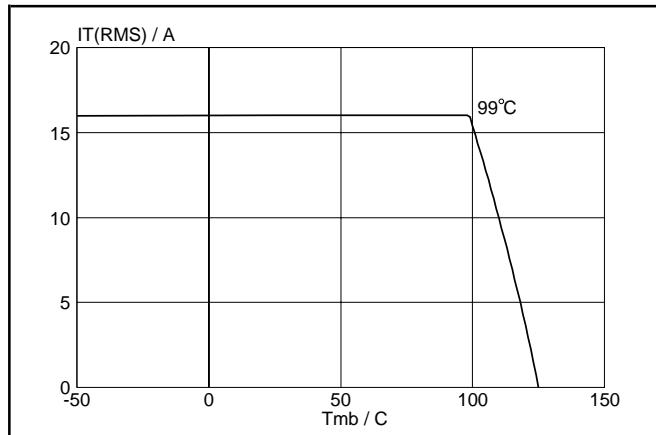


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

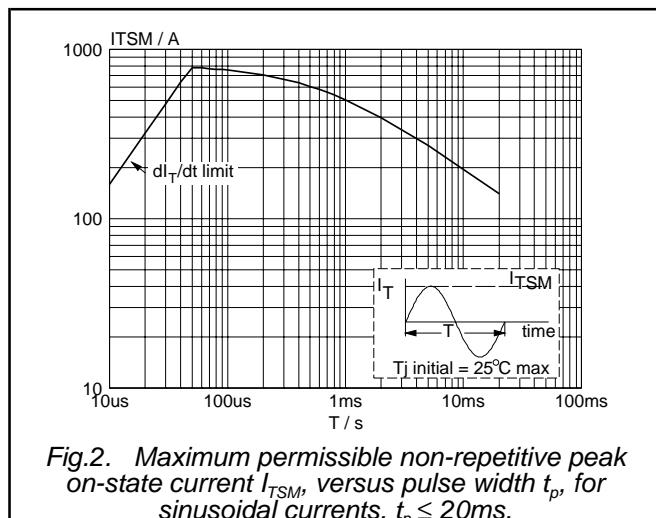


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \leq 20\text{ms}$.

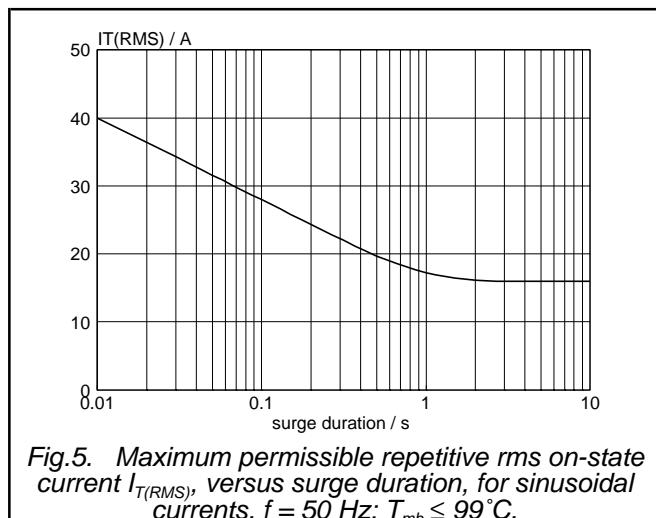


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50\text{ Hz}$; $T_{mb} \leq 99^\circ\text{C}$.

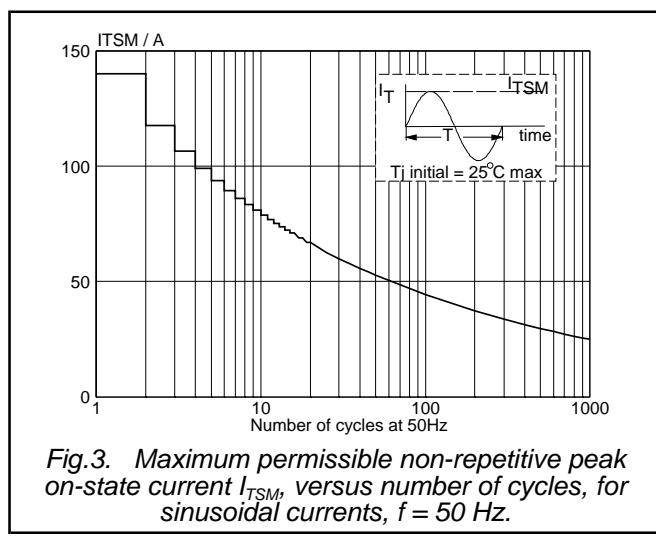


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50\text{ Hz}$.

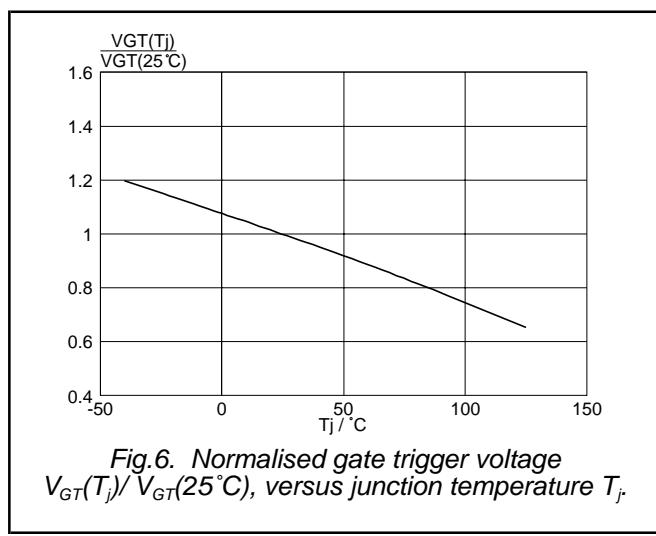


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25^\circ\text{C})$, versus junction temperature T_j .

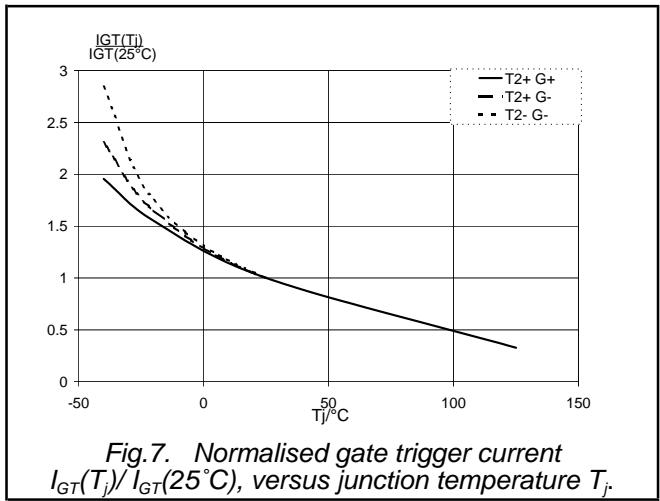


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/I_{GT}(25^\circ\text{C})$, versus junction temperature T_j .

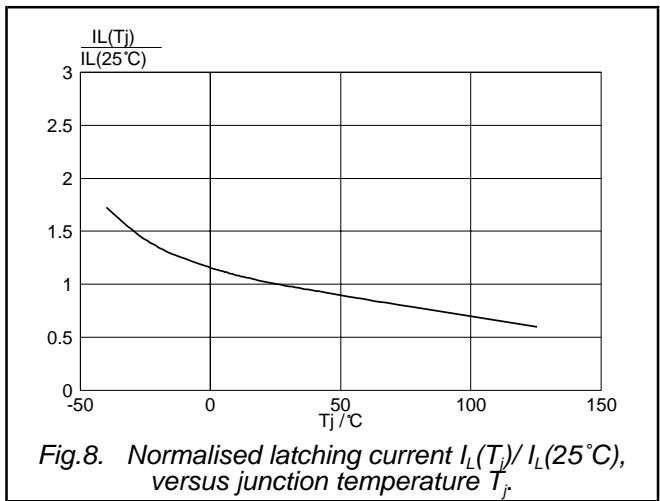


Fig.8. Normalised latching current $I_L(T_j)/I_L(25^\circ\text{C})$, versus junction temperature T_j .

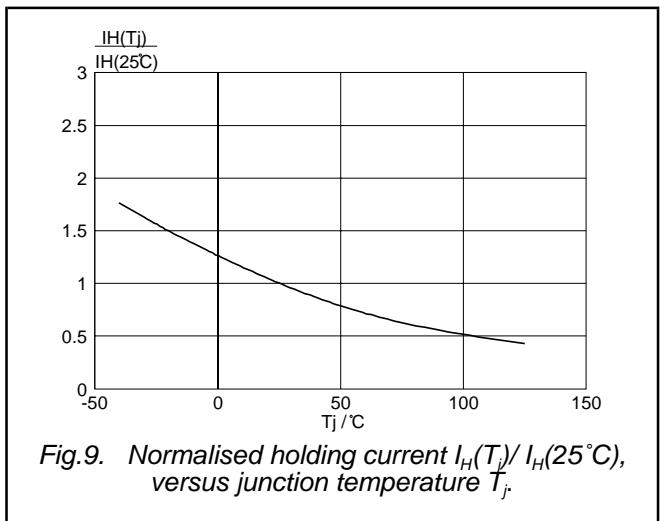


Fig.9. Normalised holding current $I_H(T_j)/I_H(25^\circ\text{C})$, versus junction temperature T_j .

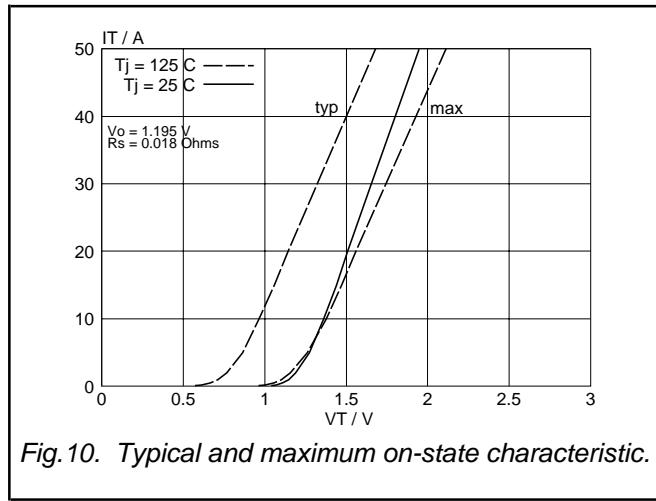


Fig.10. Typical and maximum on-state characteristic.

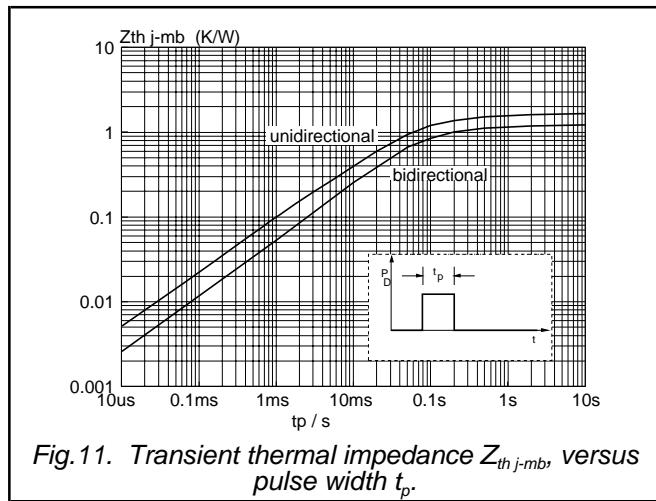


Fig.11. Transient thermal impedance $Z_{th,j-mb}$, versus pulse width t_p .

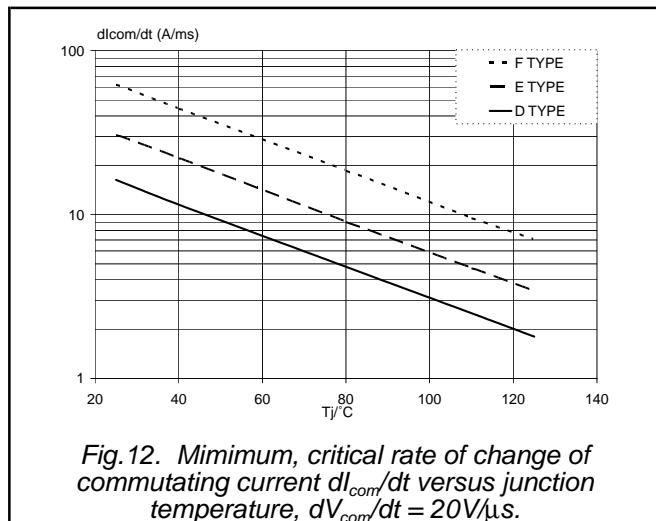


Fig.12. Minimum, critical rate of change of commutating current dl_{com}/dt versus junction temperature, $dV_{com}/dt = 20\text{V}/\mu\text{s}$.

MECHANICAL DATA

Dimensions in mm

Net Mass: 1.4 g

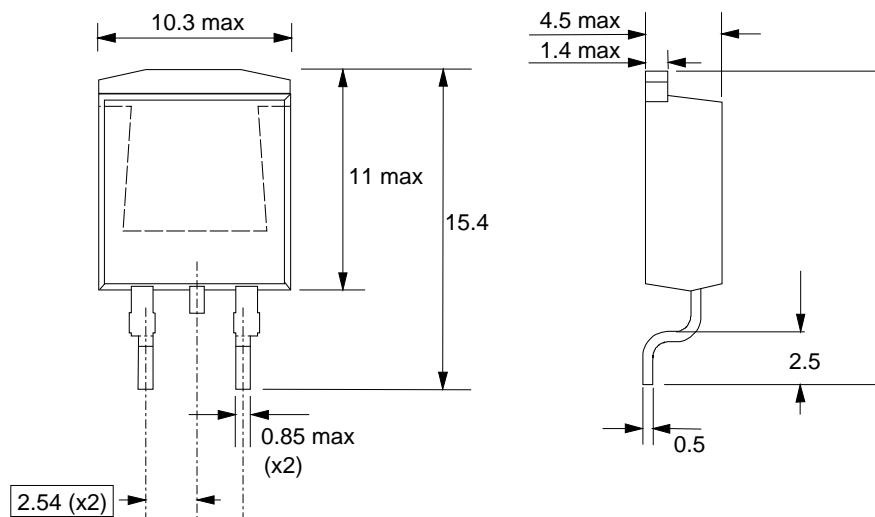


Fig.13. TO263 : centre pin connected to mounting base.

MOUNTING INSTRUCTIONS

Dimensions in mm

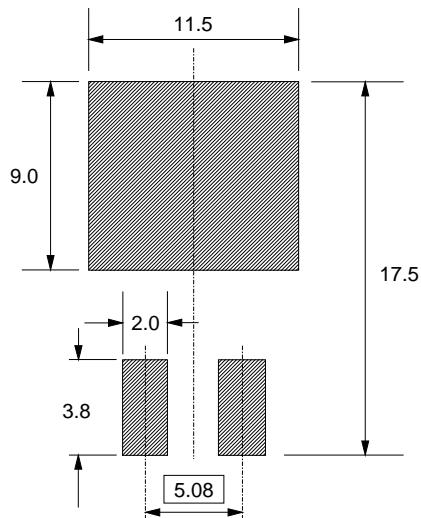


Fig.14. TO263 : minimum pad sizes for surface mounting.

Notes

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