

GENERAL DESCRIPTION

Glass passivated high commutation triacs in a full pack, plastic envelope 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.

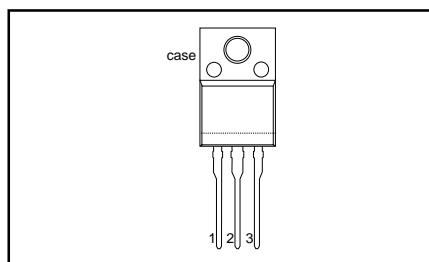
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX. BTA212X- 500B 500	MAX. 600B 600	MAX. 800B 800	UNIT
V_{DRM}	Repetitive peak off-state voltages	500B 500	600B 600	800B 800	V
$I_{T(RMS)}$	RMS on-state current	12	12	12	A
I_{TSM}	Non-repetitive peak on-state current	95	95	95	A

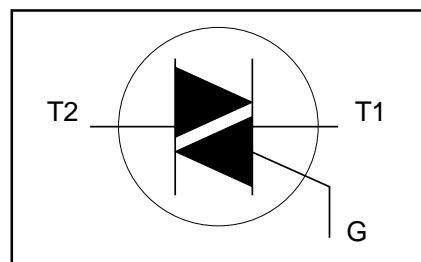
PINNING - TO220F

PIN	DESCRIPTION
1	main terminal 1
2	main terminal 2
3	gate
case	isolated

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	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{hs} \leq 56^\circ C$	-	600 ¹	A
I_{TSM}	Non-repetitive peak on-state current	full sine wave; $T_j = 25^\circ C$ prior to surge		800	
I^2t dl/dt	I^2t for fusing Repetitive rate of rise of on-state current after triggering	$t = 20\text{ ms}$ $t = 16.7\text{ ms}$ $t = 10\text{ ms}$ $I_{TM} = 20\text{ A}; I_G = 0.2\text{ A};$ $dl_G/dt = 0.2\text{ A}/\mu s$	- - - -	95 105 45 100	A A A ² s A/ μs
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

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 .

ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs} = 25^\circ C$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	R.M.S. isolation voltage from all three terminals to external heatsink	$f = 50-60 \text{ Hz}$; sinusoidal waveform; R.H. $\leq 65\%$; clean and dustfree	-		2500	V
C_{isol}	Capacitance from T2 to external heatsink	$f = 1 \text{ MHz}$	-	10	-	pF

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th j-hs}$	Thermal resistance junction to heatsink	full or half cycle with heatsink compound	-	-	4.0	K/W
$R_{th j-a}$	Thermal resistance junction to ambient	without heatsink compound in free air	-	55	5.5	K/W

STATIC CHARACTERISTICS

$T_j = 25^\circ C$ 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+ T2+ G- T2- G-	2 2 2	18 21 34	50 50 50	mA mA mA
I_L	Latching current	$V_D = 12 \text{ V}$; $I_{GT} = 0.1 \text{ A}$				
		T2+ G+ T2+ G- T2- G-	- - -	31 34 30	60 90 60	mA mA mA
I_H	Holding current	$V_D = 12 \text{ V}$; $I_{GT} = 0.1 \text{ A}$				
V_T	On-state voltage	$I_T = 17 \text{ A}$				
V_{GT}	Gate trigger voltage	$V_D = 12 \text{ V}$; $I_T = 0.1 \text{ A}$				
I_D	Off-state leakage current	$V_D = 400 \text{ V}$; $I_T = 0.1 \text{ A}$; $T_j = 125^\circ C$ $V_D = V_{DRM(max)}$; $T_j = 125^\circ C$	0.25	0.4	-	V
			-	0.1	0.5	mA

DYNAMIC CHARACTERISTICS

$T_j = 25^\circ C$ 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/ μ s
dl_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400 \text{ V}$; $T_j = 125^\circ C$; $I_{T(RMS)} = 12 \text{ A}$; without snubber; gate open circuit	-	24	-	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	-	μ s

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

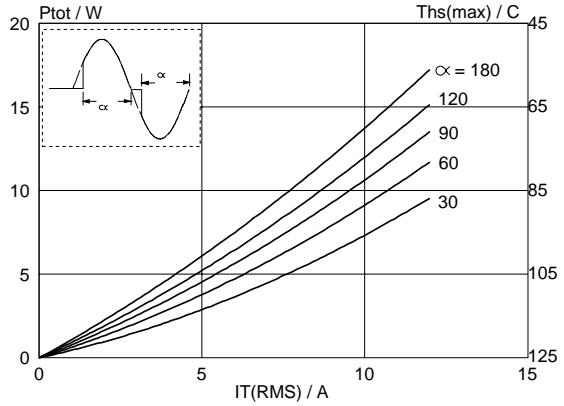


Fig.1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

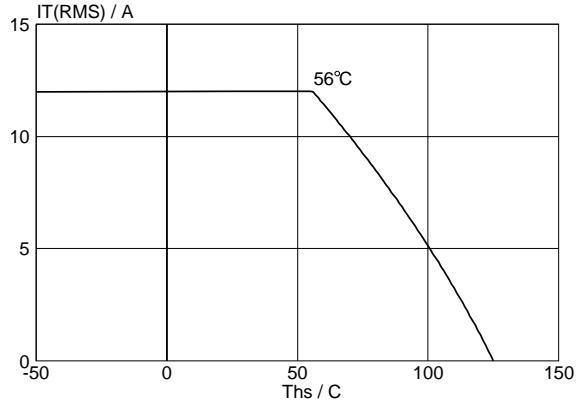


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus heatsink temperature Ths .

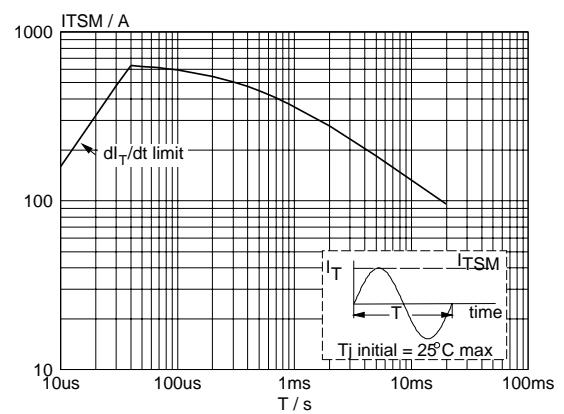


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \leq 20\text{ms}$.

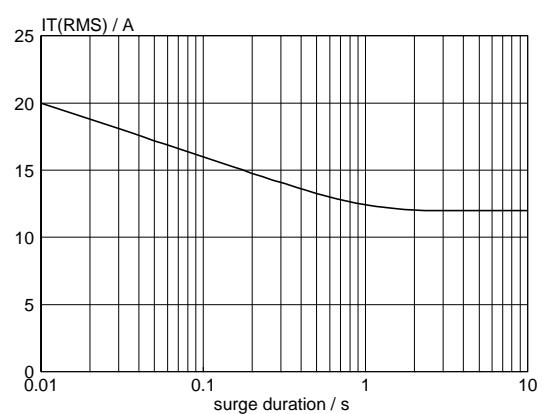


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50\text{ Hz}$; $Ths \leq 56^\circ\text{C}$.

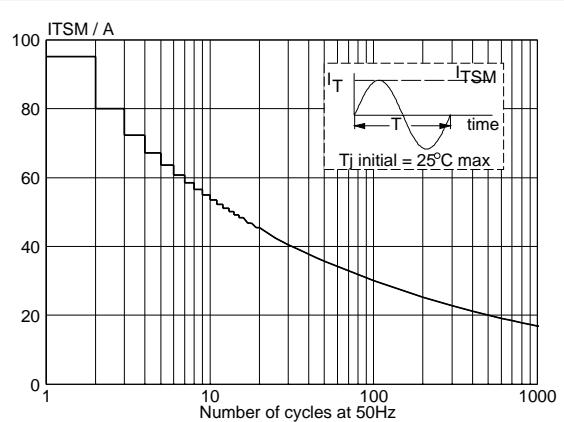


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50\text{ Hz}$.

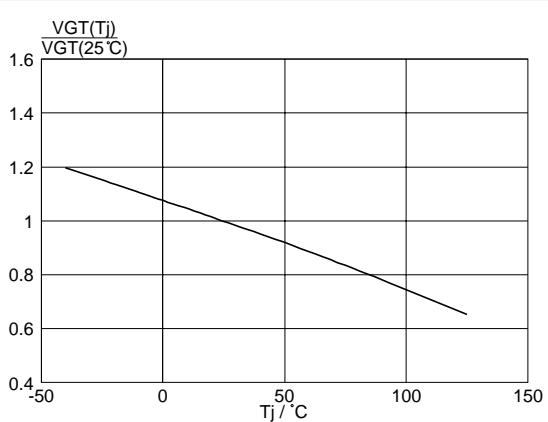


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25^\circ\text{C})$, versus junction temperature T_j .

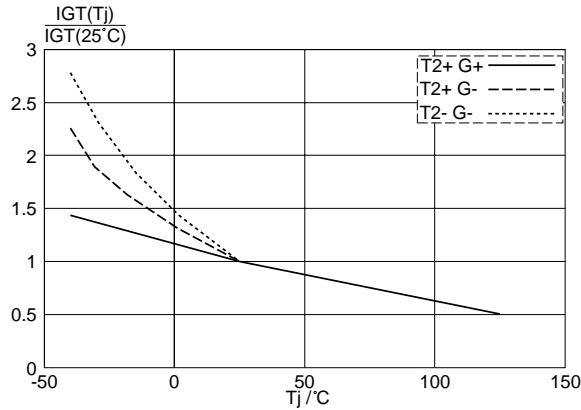


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/I_{GT}(25^\circ C)$, versus junction temperature T_j .

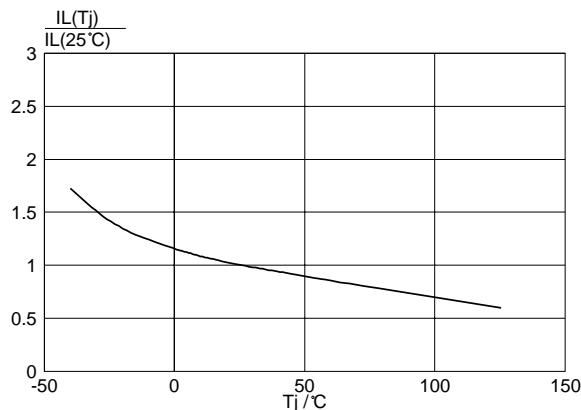


Fig.8. Normalised latching current $I_L(T_j)/I_L(25^\circ C)$, versus junction temperature T_j .

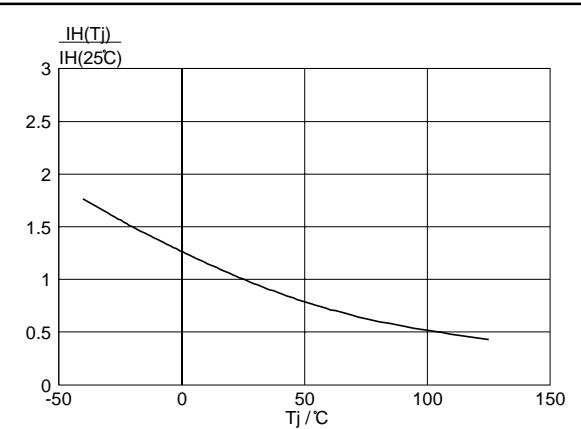


Fig.9. Normalised holding current $I_H(T_j)/I_H(25^\circ C)$, versus junction temperature T_j .

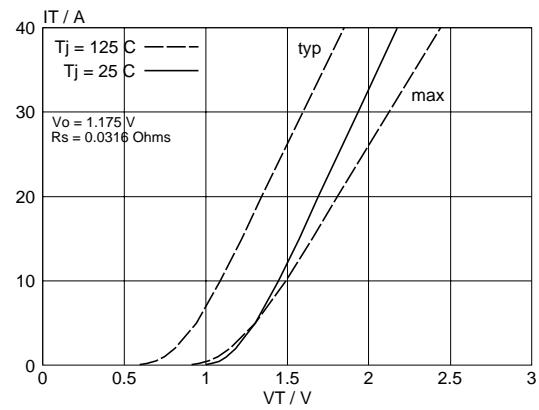


Fig.10. Typical and maximum on-state characteristic.

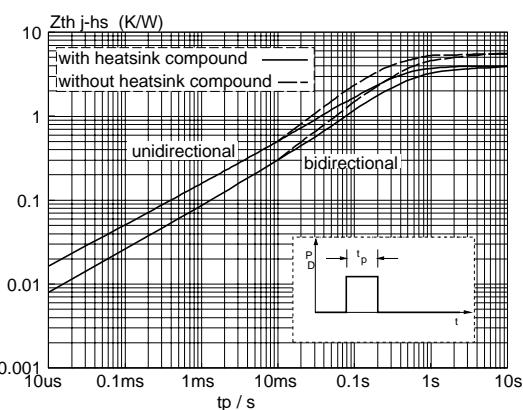


Fig.11. Transient thermal impedance $Z_{th\ j-hs}$, versus pulse width t_p .

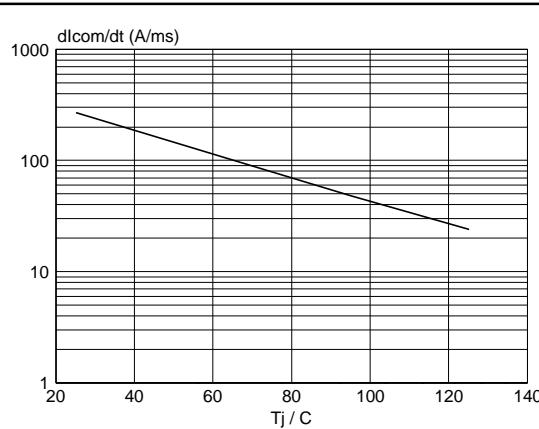


Fig.12. Typical critical rate of change of commutating current dl_{com}/dt versus junction temperature.

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

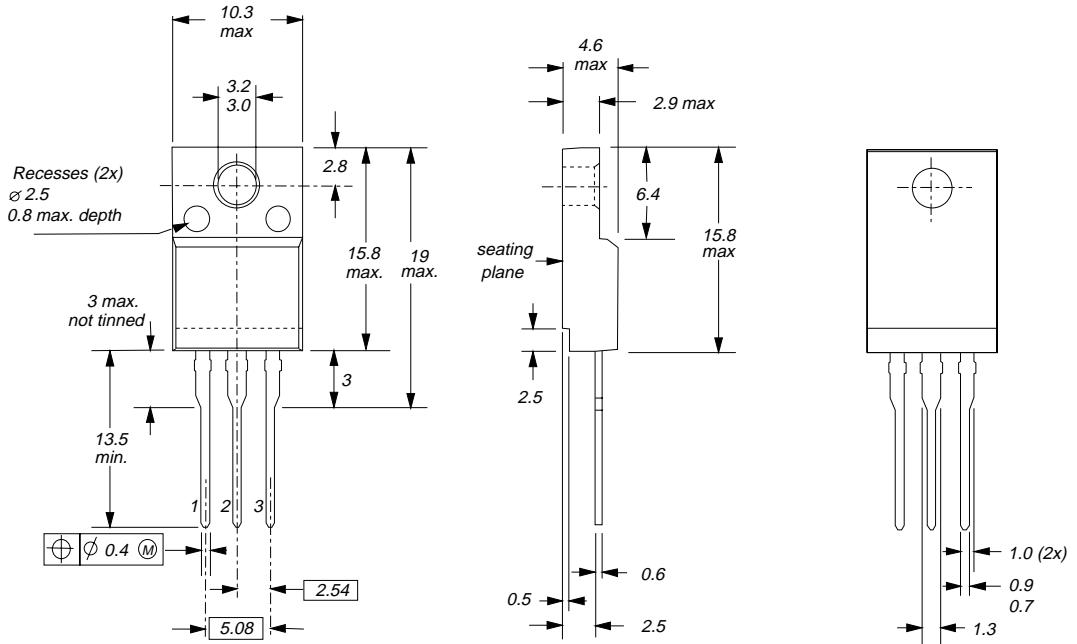


Fig.13. TO220F; The seating plane is electrically isolated from all terminals.

Notes

1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".