

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

## 2、Applications



Typical applications include motor control, industrial and domestic lighting, heating and static switching.

- Heating regulation
- Motor control
- Phase control

## 3、Features

- Blocking voltage to 800 V
- On-state RMS current to 12A
- Ultra low gate trigger current
- Low cost package.

## 4、Pinning information

PIN	Description	Simplified outline	Symbol
1	main terminal 1 ( T1 )	 TO-220	
2	main terminal 2 ( T2 )		
3	gate ( G )		

## 5、Quick reference data

SYMBOL	PARAMETER	MAX	UNIT
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltages	800	V
$I_{T(RMS)}$	RMS on-state current	12	A
$I_{TSM}$	Non-repetitive peak on-state current	90	A

## 6、Thermal characteristics

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{thj-mb}$	Thermal resistance junction to mounting base	full cycle	-	-	1.5	K/W
		half cycle	-	-	2.0	K/W
$R_{thj-a}$	Thermal resistance junction to ambient	in free air		60	-	K/W

## 7、Limiting value

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

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
$V_{DRM} V_{RRM}$	Repetitive peak off-state voltages		-	800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 102\text{ }^{\circ}\text{C}$	-	12	A
	Non-repetitive peak on-state current	full sine wave; $T_j = 25\text{ }^{\circ}\text{C}$	-	120	A
		prior to surge $t = 20\text{ ms}$ $t = 16.7\text{ ms}$	-	126	A
$I^2t$	$I^2t$ for fusing	$t = 10\text{ ms}$	-	78	$\text{A}^2\text{s}$
$di_T/dt$	Repetitive rate of rise of on-state current after triggering	$I_{TM} = 12\text{ A}$ ; $I_G = 0.2\text{ A}$ ; $DI_G/dt = 0.2\text{ A/s}$  T2+ G+ T2+ G- T2- G-	-	100	$\text{A}/\mu\text{s}$
			-	100	$\text{A}/\mu\text{s}$
			-	100	$\text{A}/\mu\text{s}$
$I_{GM}$	Peak gate current		-	2	A
$V_{GM}$	Peak gate voltage		-	8	V
$P_{GM}$	Peak gate power		-	16	W
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.35	W
$T_{stg}$	Storage temperature		-40	150	$^{\circ}\text{C}$
$T_j$	Junction temperature		-40	125	$^{\circ}\text{C}$

## 8、Characteristics

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I <sub>GT</sub>	Gate trigger current	V <sub>D</sub> = 12 V; I <sub>T</sub> = 0.1A				
		T2+ G+	5.0	-	25	mA
		T2+ G-	5.0	13	25	mA
		T2- G-	5.0	13	25	mA
I <sub>L</sub>	Latching current	V <sub>D</sub> = 12 V; I <sub>GT</sub> = 0.1A				
		T2+ G+	-	20	50	mA
		T2+ G-	-	30	80	mA
		T2- G-	-	20	50	mA
I <sub>H</sub>	Holding current	V <sub>D</sub> = 12 V; I <sub>GT</sub> = 0.15A	-	20	40	mA
V <sub>T</sub>	On-state voltage	I <sub>T</sub> = 17A	-	-	1.95	V
V <sub>GT</sub>	Gate trigger voltage	V <sub>D</sub> = 12 V; I <sub>T</sub> = 0.1A				
		T2+ G+	0.5	0.78	1.5	V
		T2+ G-	0.5	0.70	1.5	V
		T2- G-	0.5	0.71	1.5	V
Dynamic Characteristics						
dV <sub>D</sub> /dt	Critical rate of rise of off-state voltage	V <sub>DM</sub> = 67% V <sub>DRM(max)</sub> ; T <sub>j</sub> = 125 °C; Exponential wave form; gate open circuit	250	500	-	V/μs
di <sub>com</sub> /dt	Critical rate of change of commutating current	V <sub>D</sub> = 400 V; T <sub>j</sub> = 125 °C I <sub>T(RMS)</sub> =4.4A; Commutating dv/dt = 18 V/ s, Without snubber; gate open circuit	6.5	-	-	A/ms
di/dt	Repetitive Critical Rate of Rise of On-State Current	I <sub>PK</sub> = 50 A; PW = 40 sec; di <sub>G</sub> /dt = 200 mA/ sec; f = 60 Hz	-	-	10	A/μs

# 9. Electrical Characteristics Curve

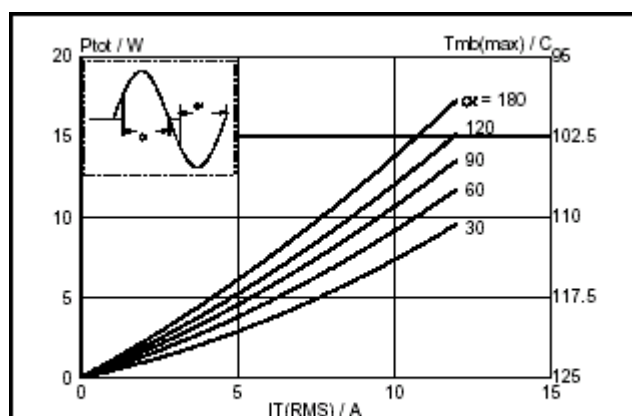


Fig. 1. Maximum on-state dissipation,  $P_{tot}$ , versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha$  = conduction angle.

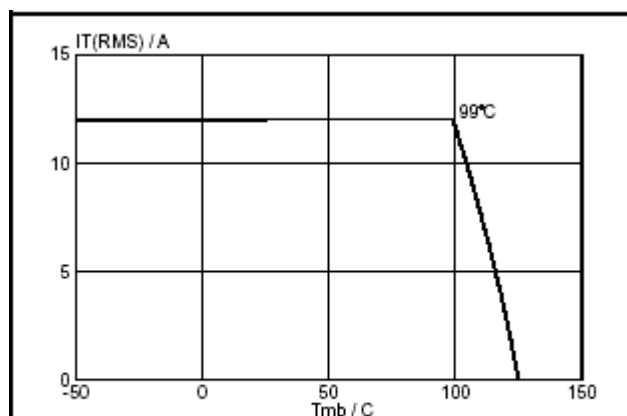


Fig. 4. Maximum permissible rms current  $I_{T(RMS)}$ , versus mounting base temperature  $T_{mb}$ .

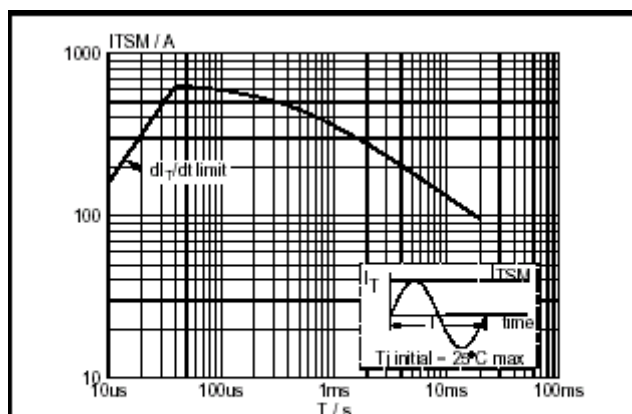


Fig. 2. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus pulse width  $t_p$ , for sinusoidal currents,  $t_p \leq 20$ ms.

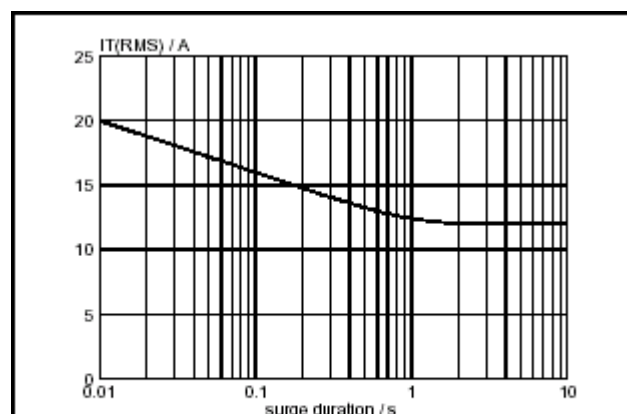


Fig. 5. Maximum permissible repetitive rms on-state current  $I_{T(RMS)}$ , versus surge duration, for sinusoidal currents,  $f = 50$  Hz;  $T_{mb} \leq 99^\circ\text{C}$ .

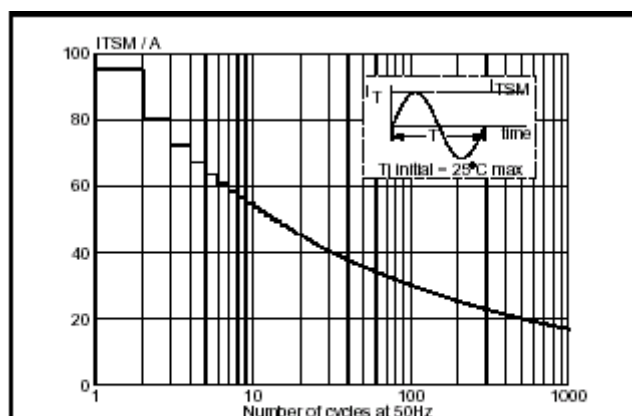


Fig. 3. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f = 50$  Hz.

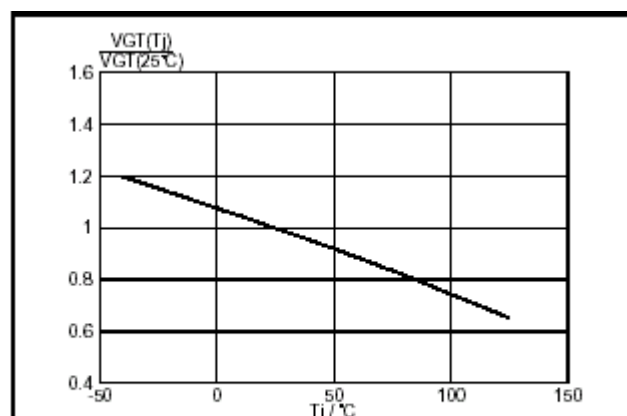
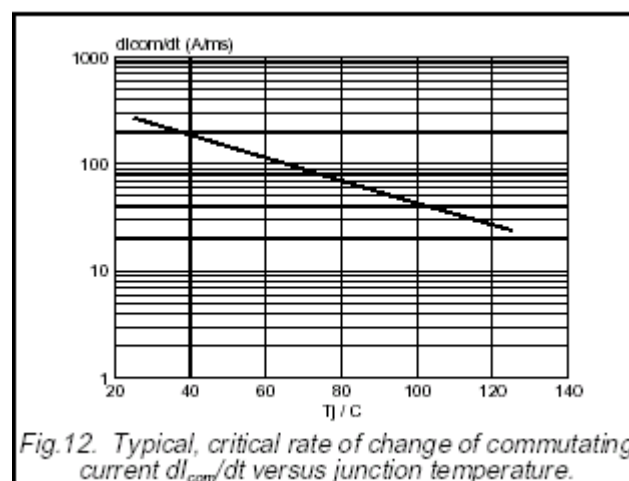
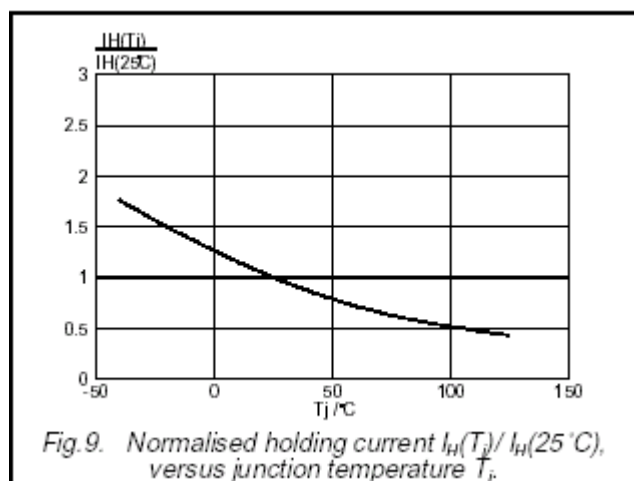
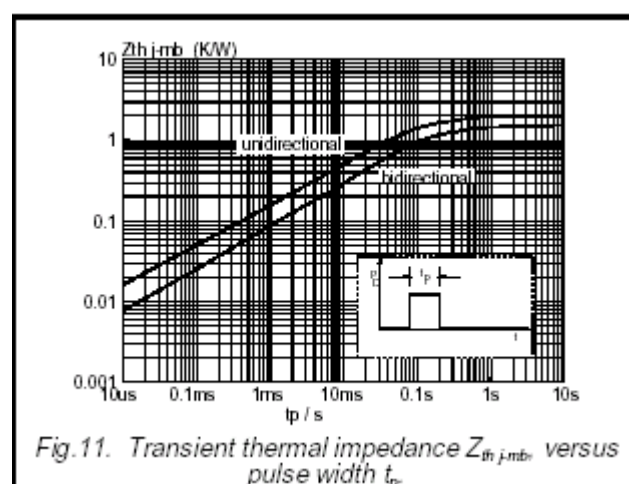
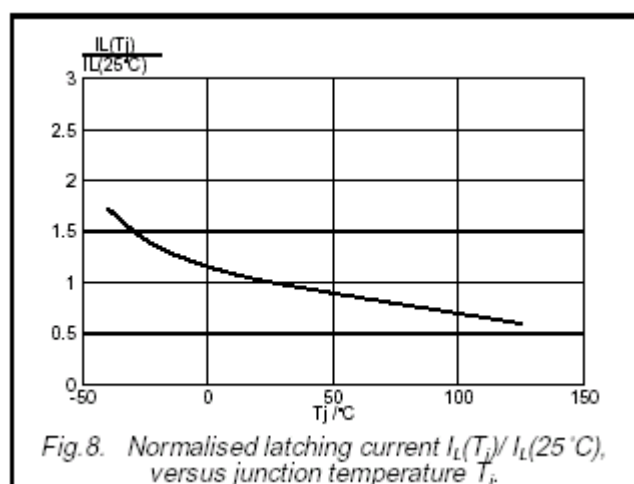
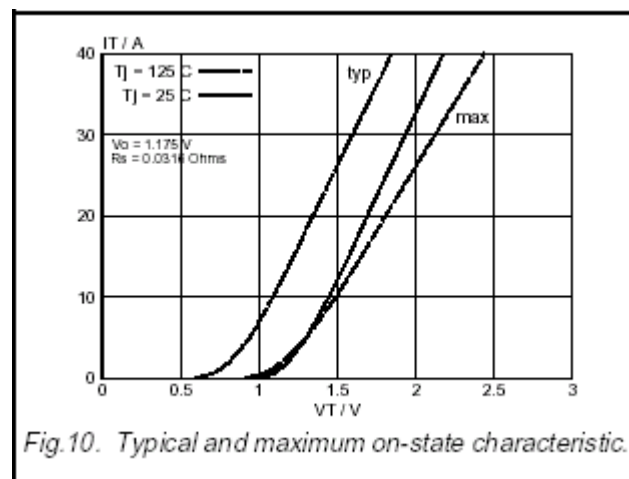
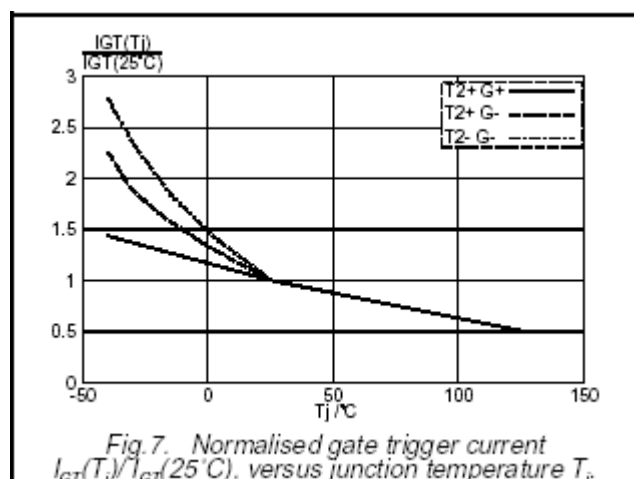
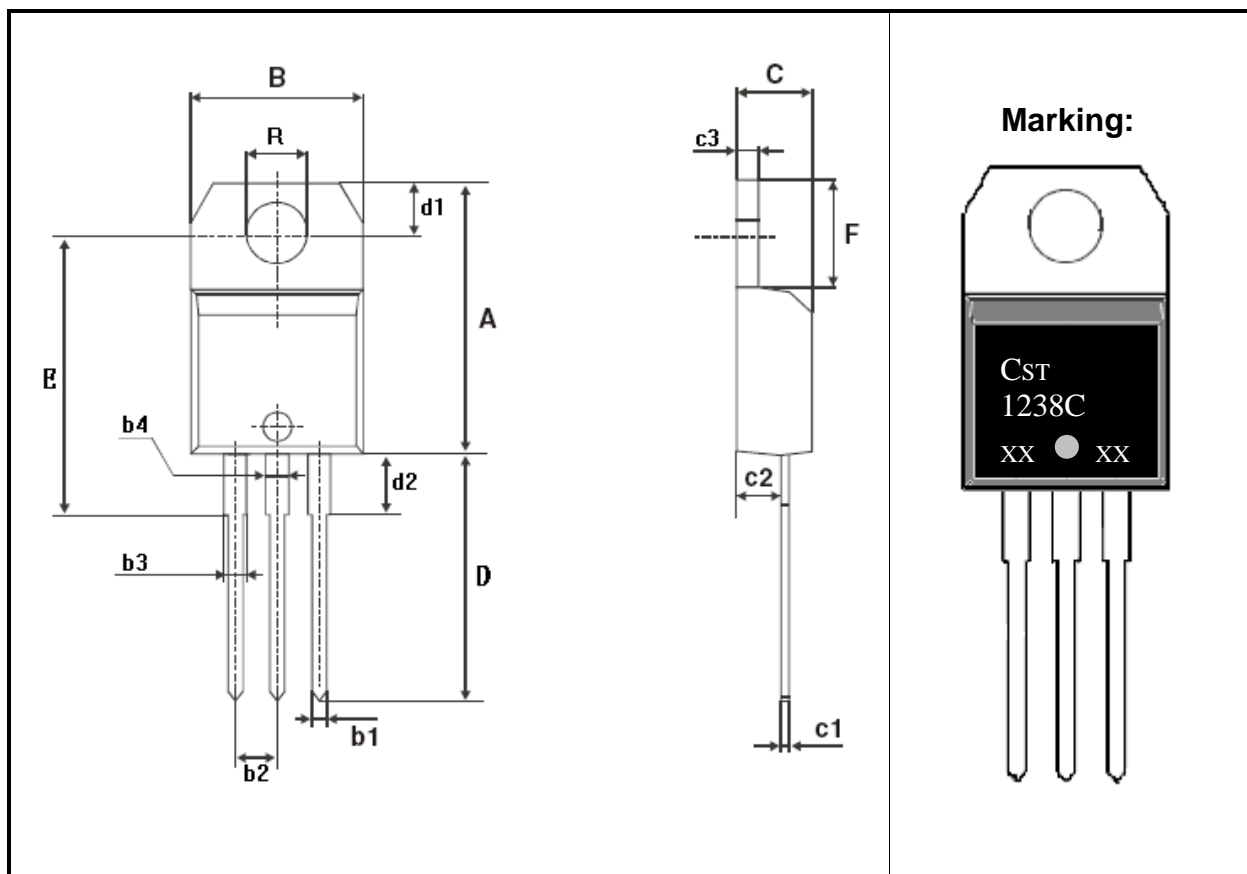


Fig. 6. Normalised gate trigger voltage  $V_{GT}(T_j)/V_{GT}(25^\circ\text{C})$ , versus junction temperature  $T_j$ .



## 10、Package outline (TO-220I)



DIM	Inches			Millimeters		
	Min	Type	Max	Min	Type	Max
A	0.591	-	0.646	15.00	-	16.40
B	0.386	-	0.409	9.80	-	10.40
C	0.160	-	0.190	4.07	-	4.82
D	0.500	-	0.562	12.70	-	14.27
E	-	0.640	-	-	16.25	-
F	0.248	-	0.271	6.29	-	6.89
R	0.140	-	0.156	3.56	-	3.96
b1	0.030	-	0.037	0.75	-	0.95
b2	0.095	-	0.105	2.42	-	2.66
b3	0.046	-	0.054	1.17	-	1.37
b4	0.046	-	0.054	1.17	-	1.37
c1	0.017	-	0.023	0.42	-	0.58
c2	0.091	-	0.115	2.32	-	2.92
c3	0.045	-	0.055	1.15	-	1.39
d1	0.100	-	0.120	2.54	-	3.04
d2	0.125	-	0.155	3.18	-	3.93