

GENERAL DESCRIPTION

Glass passivated thyristors in a full pack, plastic envelope, intended for use in applications requiring high bidirectional blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting, heating and static switching.

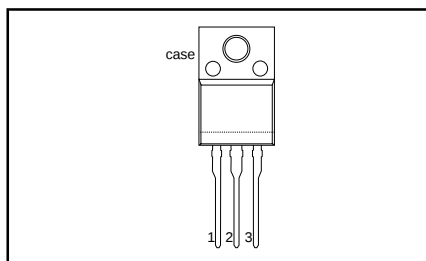
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
V_{DRM} , V_{RRM}	BT152X- Repetitive peak off-state voltages	400R 450	600R 650	800R 800	V
$I_{T(AV)}$	Average on-state current	13	13	13	A
$I_{T(RMS)}$	RMS on-state current	20	20	20	A
I_{TSM}	Non-repetitive peak on-state current	200	200	200	A

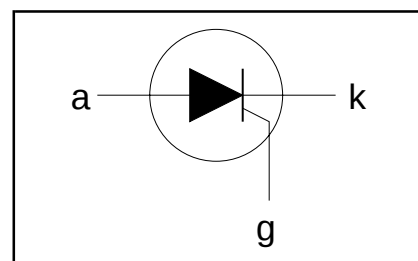
PINNING - TO220F

PIN	DESCRIPTION
1	cathode
2	anode
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		-	-400R 450 ¹	-600R 650 ¹	-800R 800	V
$I_{T(AV)}$	Average on-state current	half sine wave; $T_{hs} \leq 43^\circ\text{C}$	-	13			A
$I_{T(RMS)}$	RMS on-state current	all conduction angles	-	20			A
I_{TSM}	Non-repetitive peak on-state current	half sine wave; $T_j = 25^\circ\text{C}$ prior to surge $t = 10\text{ ms}$	-	200			A
		$t = 8.3\text{ ms}$	-	220			A
I^2t	I^2t for fusing	$t = 10\text{ ms}$	-	200			A ² s
di_T/dt	Repetitive rate of rise of on-state current after triggering	$I_{TM} = 50\text{ A}$; $I_G = 0.2\text{ A}$; $di_G/dt = 0.2\text{ A}/\mu\text{s}$	-	200			A/ μs
I_{GM}	Peak gate current		-	5			A
V_{GM}	Peak gate voltage		-	5			V
V_{RGM}	Peak reverse gate voltage		-	5			V
P_{GM}	Peak gate power		-	20			W
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.5			W
T_{stg}	Storage temperature		-40	150			$^\circ\text{C}$
T_j	Operating junction temperature		-	125			$^\circ\text{C}$

¹ Although not recommended, off-state voltages up to 800V may be applied without damage, but the thyristor may switch to the on-state. The rate of rise of current should not exceed 15 A/ μs .

ISOLATION LIMITING VALUE & CHARACTERISTIC

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	R.M.S. isolation voltage from all three terminals to external heatsink	$f = 50\text{-}60\text{ Hz}$; 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
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	4.0	K/W
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heatsink	without heatsink compound	-	-	5.5	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air	-	55	-	K/W

STATIC CHARACTERISTICS

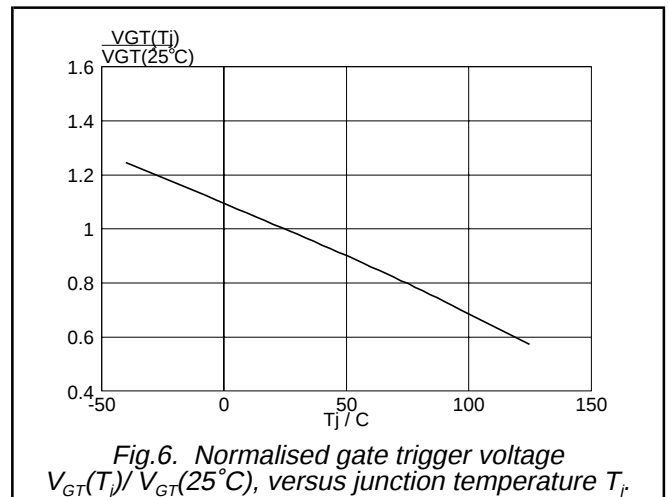
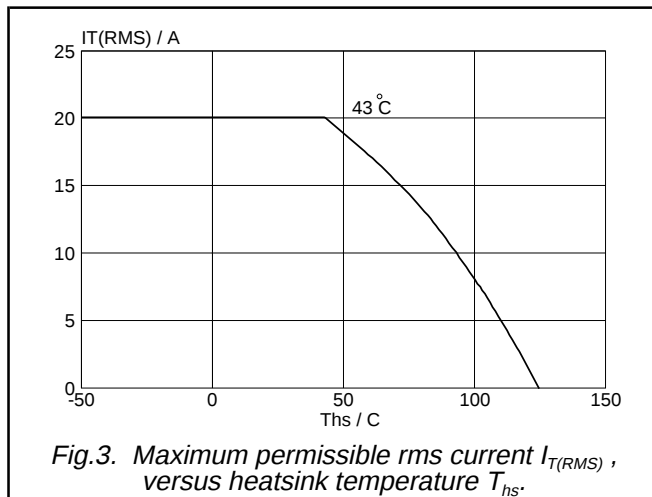
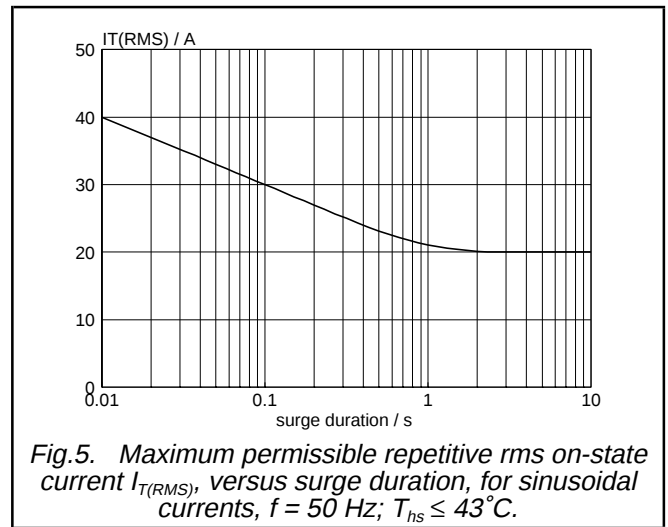
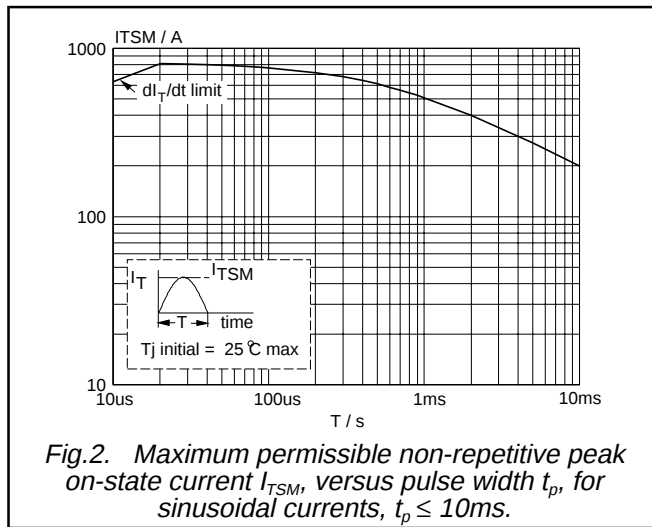
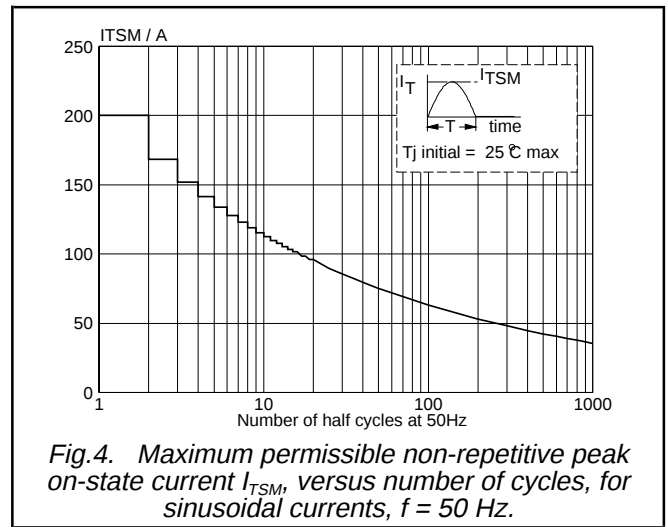
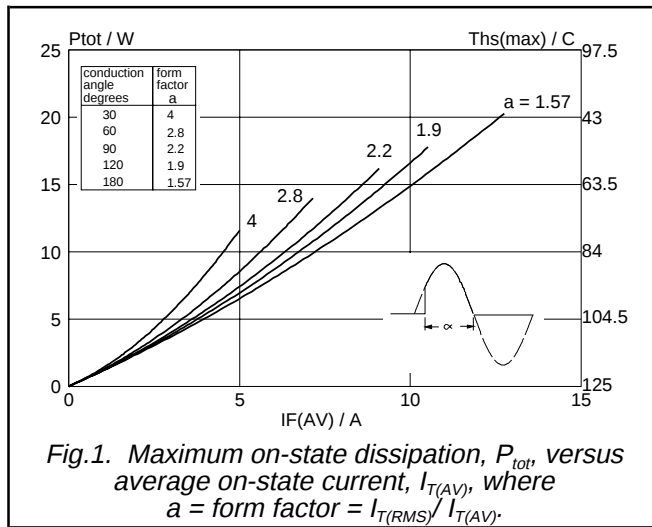
$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise stated

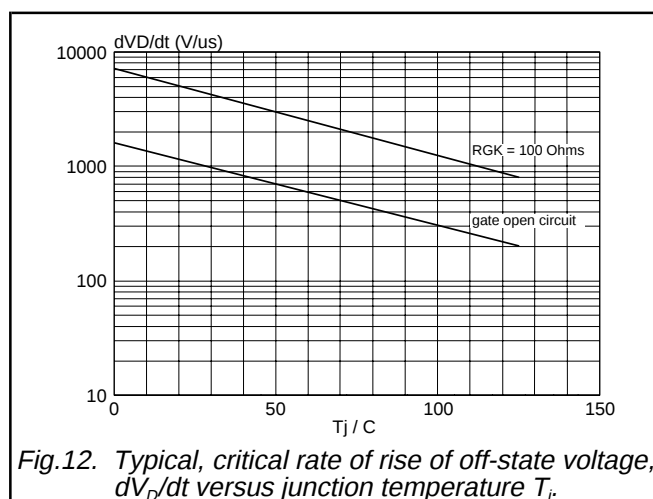
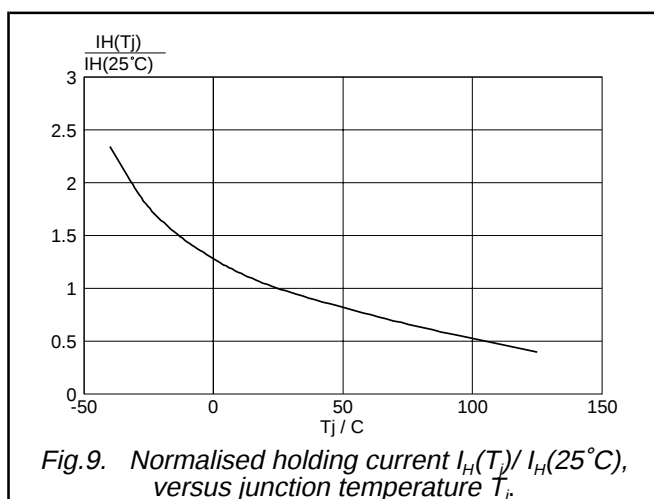
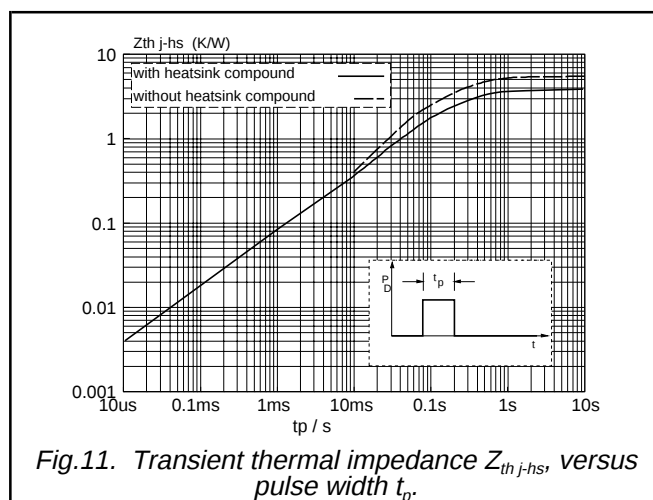
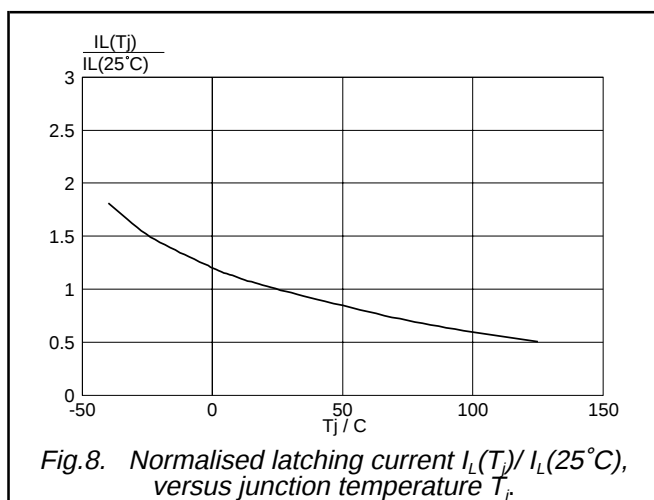
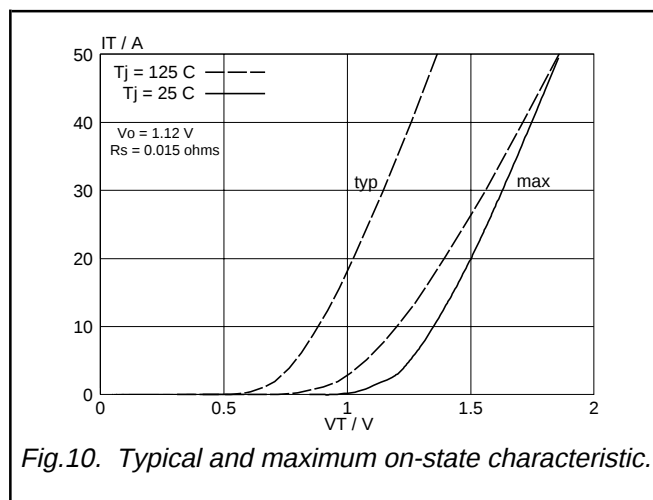
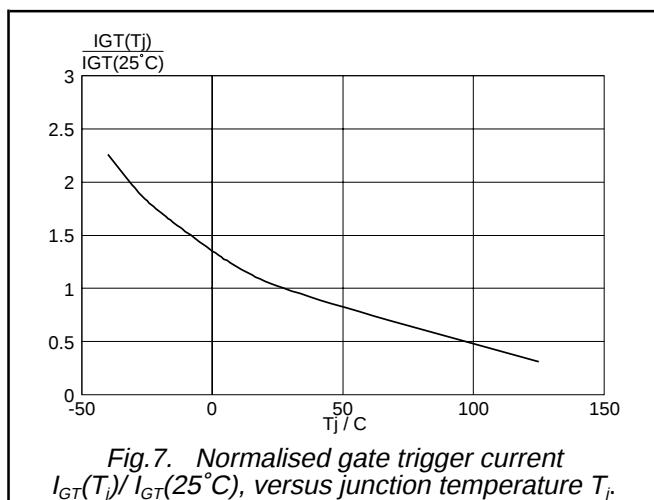
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{GT}	Gate trigger current	$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$	-	3	32	mA
I_L	Latching current	$V_D = 12\text{ V}$; $I_{GT} = 0.1\text{ A}$	-	25	80	mA
I_H	Holding current	$V_D = 12\text{ V}$; $I_{GT} = 0.1\text{ A}$	-	15	60	mA
V_T	On-state voltage	$I_T = 40\text{ A}$	-	1.4	1.75	V
V_{GT}	Gate trigger voltage	$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$	-	0.6	1.5	V
$I_{D\text{, } I_R}$	Off-state leakage current	$V_D = V_{DRM(max)}$; $I_T = 0.1\text{ A}$; $T_j = 125\text{ }^{\circ}\text{C}$	0.25	0.4	-	V
		$V_D = V_{DRM(max)}$; $V_R = V_{RRM(max)}$; $T_j = 125\text{ }^{\circ}\text{C}$	-	0.2	1.0	mA

DYNAMIC CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
dV_D/dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}$; $T_j = 125\text{ }^{\circ}\text{C}$; exponential waveform gate open circuit	200	300	-	V/ μs
t_{gt}	Gate controlled turn-on time	$V_D = V_{DRM(max)}$; $I_G = 0.1\text{ A}$; $dI_G/dt = 5\text{ A}/\mu\text{s}$; $I_{TM} = 40\text{ A}$	-	2	-	μs
t_q	Circuit commutated turn-off time	$V_D = 67\% V_{DRM(max)}$; $T_j = 125\text{ }^{\circ}\text{C}$; $I_{TM} = 50\text{ A}$; $V_R = 25\text{ V}$; $dI_{TM}/dt = 30\text{ A}/\mu\text{s}$; $dV_D/dt = 50\text{ V}/\mu\text{s}$; $R_{GK} = 100\text{ }\Omega$	-	70	-	μs





MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

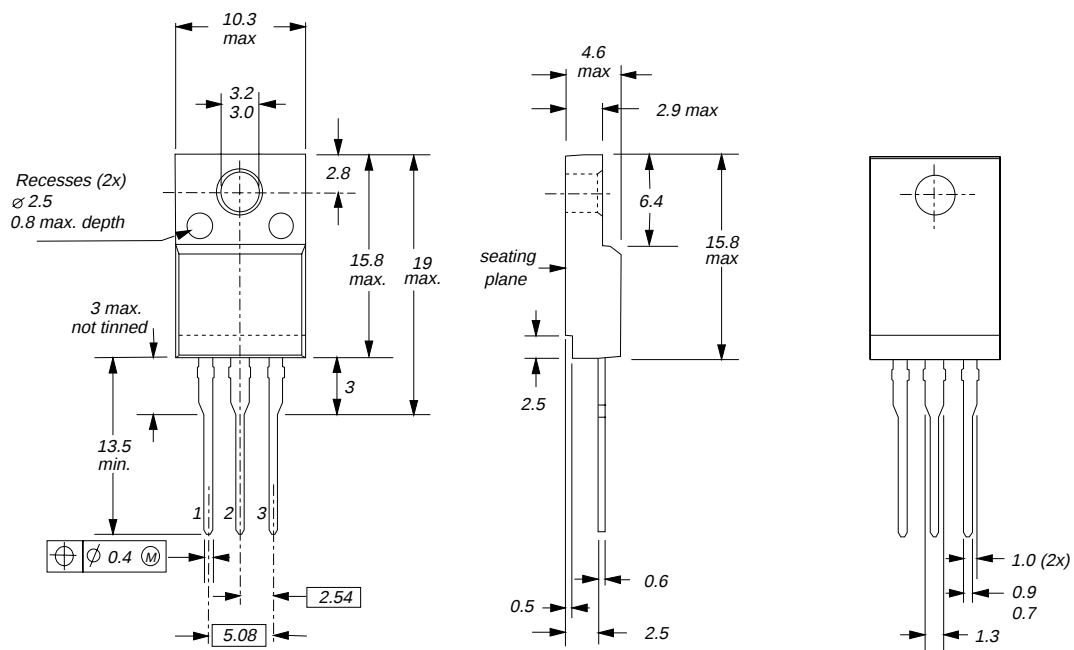


Fig.13. TO220F; The seating plane is electrically isolated from all terminals.

Notes

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