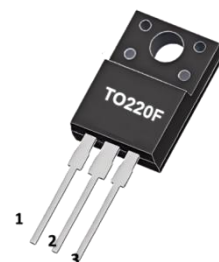
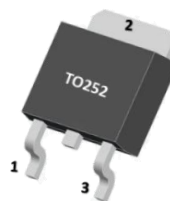




■ GENERAL DESCRIPTION

Passivated thyristors in a 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.



Pin1:K (Cathode)
Pin2:A (Anode)
Pin3:G (Gate)

■ ABSOLUTE MAXIMUM RATINGS (TC=25°C, unless otherwise specified)

SYMBOL	PARAMETER		TEST CONDITION	VALUE	UNIT
V_{DRM}	Repetitive Peak off-state voltage	BT151	T _J =25°C	800	V
I_{T(AV)}	Average On-State Current (half sine wave; T _c ≤109°C)			7.5	A
I_{T(RMS)}	RMS forward current(all conduction angles)			8	A
I_{TSM}	Non-repetitive peak on-state current (half sine wave; T _J =25°C prior to surge)	t=10ms		100	A
		t=8.3ms		110	
I²t	I ² t for fusing	t=10ms		50	A ² S
di/dt	Critical rate of rise of on-state current, I _{TM} = 20A; I _G = 50mA; di _G /dt = 50mA/μs			50	A/μs
I_{GM}	Peak gate current			2	A
V_{GM}	Peak gate voltage			5	V
V_{RGM}	Peak Reverse Gate Voltage			5	V
P_{G(AV)}	Average gate Power(over any 20ms period)	T _J =125°C		0.5	W
P_{GM}	Peak gate Power			5	W
T_J	Operating Junction Temperature			125	°C
T_{stg}	Storage Temperature			-40 to +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. 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 15A/μs.



■ THERMAL RESISTANCES

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252/TO-220F	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Junction to Case	TO-220F	$R_{\theta JC}$	3.31	$^{\circ}\text{C/W}$
	TO-252		2.6	$^{\circ}\text{C/W}$

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
Gate trigger current	I_{GT}	$V_D=12\text{V}; I_T=0.1\text{A}$		2	15	mA
Gate trigger voltage	I_L	$V_D=12\text{V}; I_{GT}=0.1\text{A}$		10	40	mA
Holding current	I_H	$V_D=12\text{V}; I_{GT}=0.1\text{A}$		7	20	mA
On-state voltage	V_T	$I_T=23\text{A}$		1.4	1.75	V
Gate Trigger Voltage	V_{GT}	$V_D=12\text{V}; I_T=0.1\text{A}$		0.6	1.5	V
		$V_D=V_{DRM(max)}; I_T=0.1\text{A}; T_J=125^{\circ}\text{C}$	0.25	0.4	1.3	
Off-State Leakage Current	I_{DRM}, I_{RRM}	$V_D=V_{DRM(max)}; V_R=V_{RRM(max)}; T_J=125^{\circ}\text{C}$		0.1	0.5	mA
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of off-state Voltage	dV_D/dt	$V_{DM}=67\%V_{DRM(max)}$, Exponential waveform, $T_J=125^{\circ}$	Gate open circuit	50	130	V/ μs
			$R_{GK}=100\Omega$	200	1000	
Gate Controlled Turn-on Time	t_{gt}	$I_{TM}=40\text{A}, V_D=V_{DRM}, I_G=0.1\text{mA } dI_G/dt=5\text{A}/\mu\text{s}$		2		μs
Circuit Commutated Turn-off time	t_Q	$V_D = 67\% V_{DRM(max)}, T_J = 125^{\circ}\text{C}, I_{TM} = 20\text{A}$ $V_R = 25\text{V}, dI_{TM}/dt = 30\text{A}/\mu\text{s}, dV_D/dt = 50\text{V}/\mu\text{s}$ $R_{GK} = 100\Omega$		70		μs



■ TYPICAL CHARACTERISTICS(1)

Fig 1. Maximum On-State Dissipation, P_{tot} , Versus Average On-State Current, $I_{T(AV)}$, Where $a = \text{form factor} = I_{T(RMS)} / I_{T(AV)}$

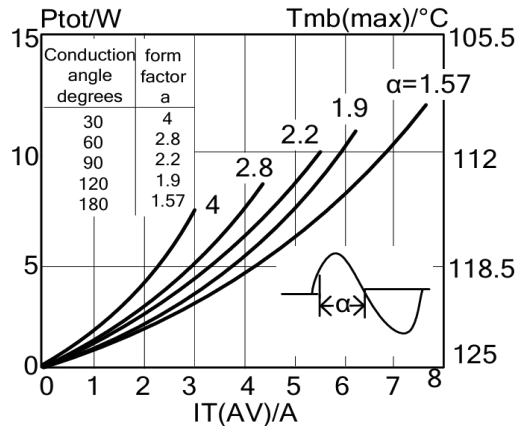


Fig 2. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , Versus Pulse Width t_p for Sinusoidal Currents, $t_p \leq 10\text{ms}$

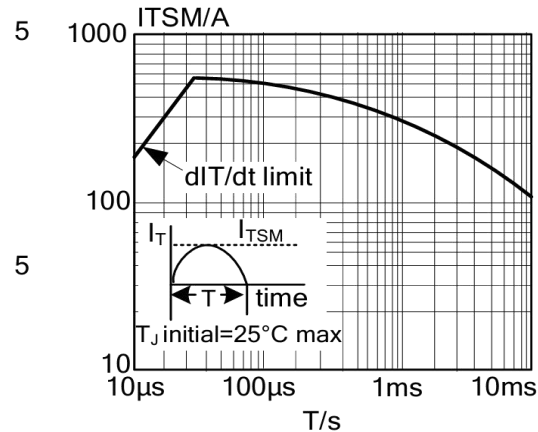


Fig 3. Maximum Permissible Rms Current $I_{T(RMS)}$, Versus Mounting Base Temperature T_{mb}

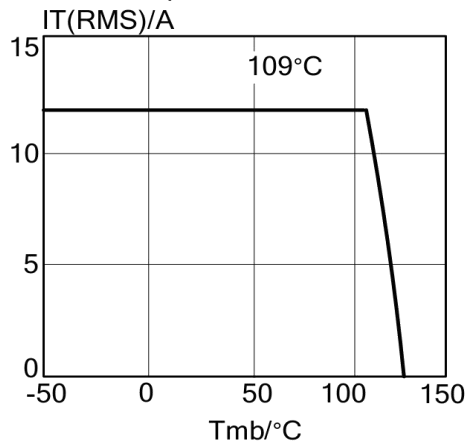


Fig 4. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , Versus Number Of Cycles, For Sinusoidal Currents, $f=50\text{Hz}$

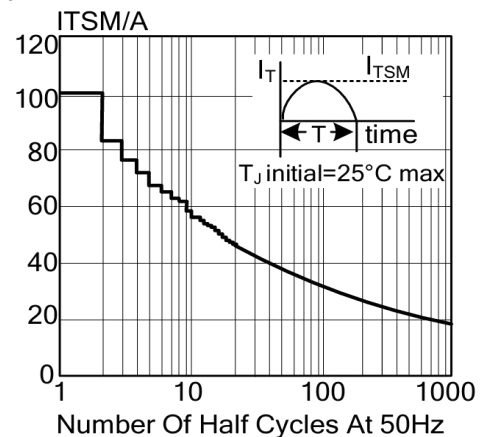


Fig 5. Maximum Permissible Repetitive Rms On-State Current $I_{T(RMS)}$, Versus Surge Duration, For Sinusoidal Currents, $f=50\text{Hz}$; $T_{mb} \leq 109^\circ\text{C}$

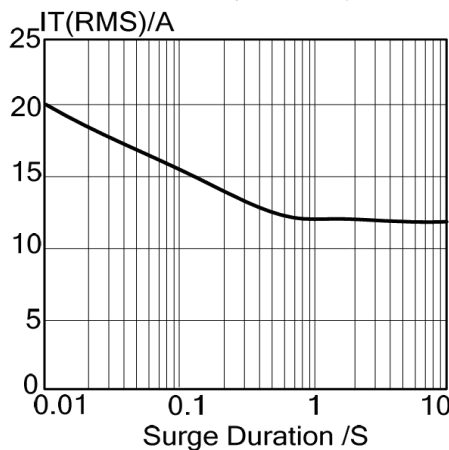
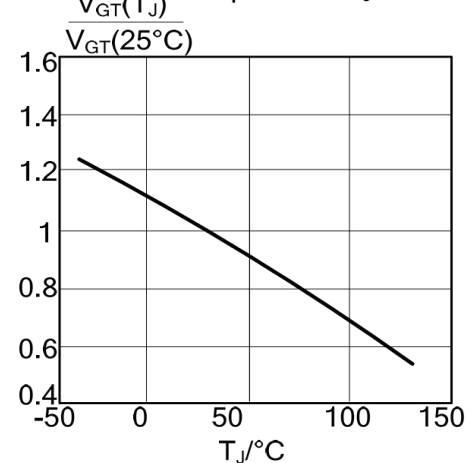


Fig 6. Normalised Gate Trigger Voltage $V_{GT}(T_J) / V_{GT}(25^\circ\text{C})$, Versus Junction Temperature T_J





■ TYPICAL CHARACTERISTICS(2)

Fig 7. Normalised Gate Trigger Current $I_{GT}(T_J)/I_{GT}(25^\circ\text{C})$, Versus Junction Temperature T_J

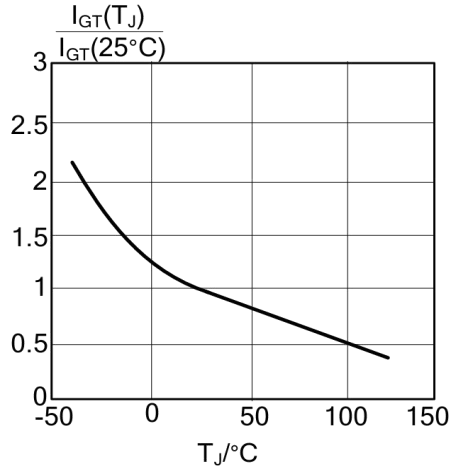


Fig 8. Normalised Latching Current $I_L(T_J)/I_L(25^\circ\text{C})$, Versus Junction Temperature T_J

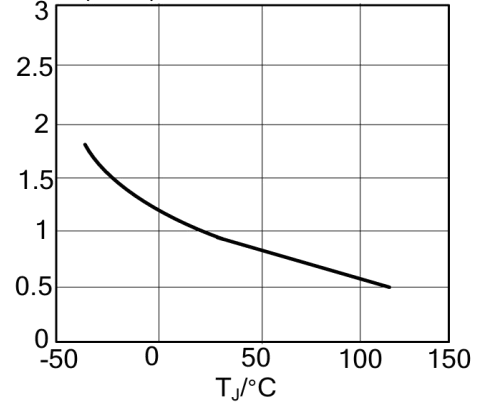


Fig 9. Normalised Holding Current $I_H(T_J)/I_H(25^\circ\text{C})$, Versus Junction Temperature T_J

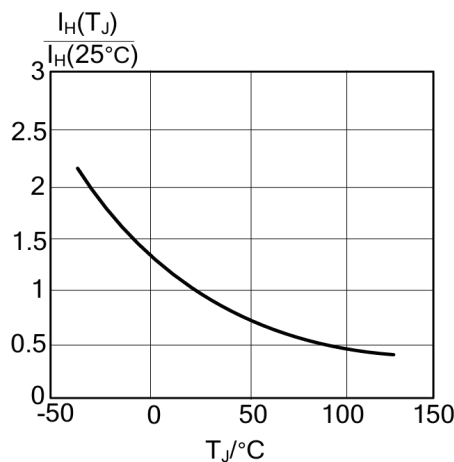


Fig 10. Typical and Maximum On-State Characteristic

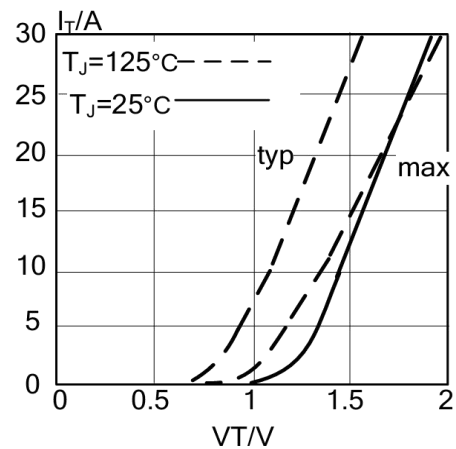


Fig 11. Transient Thermal Impedance Z_{thj-mb} , Versus Pulse Width t_p

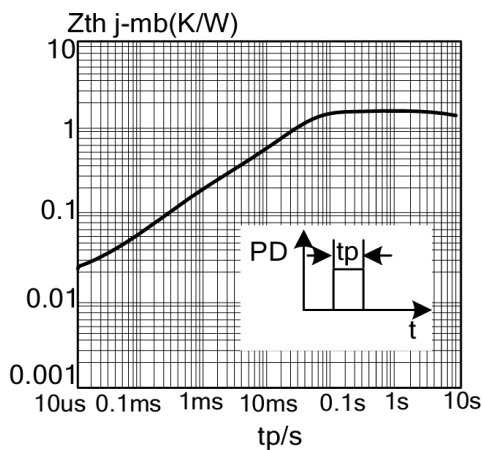
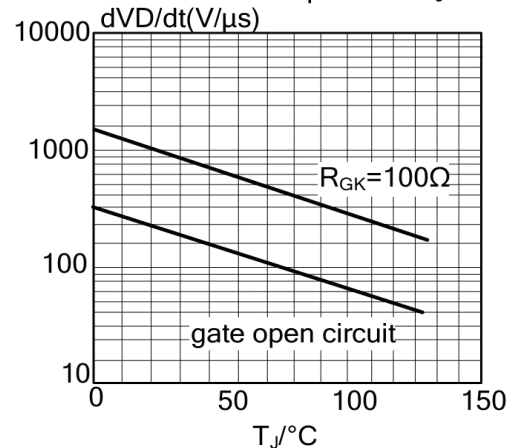
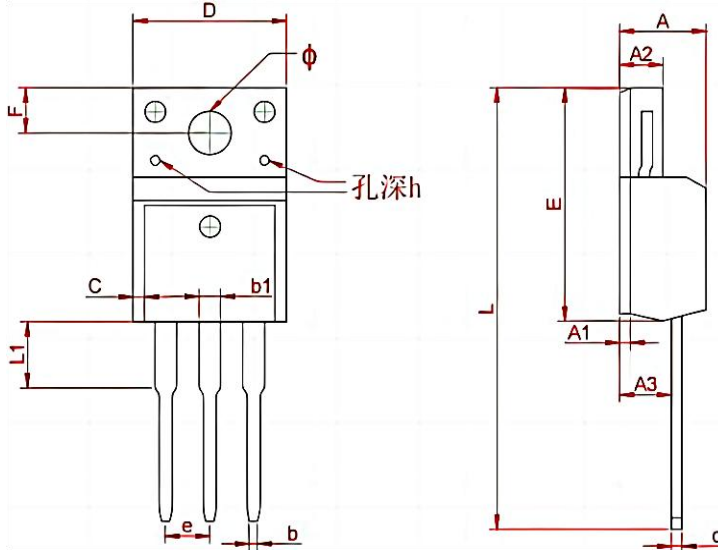


Fig 12. Typical, Critical Rate Of Rise Of Off-State Voltage, dV_D/dt Versus Junction Temperature T_J





■ **TO- 220F Package Outline Dimensions**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max	Min	Max
A	4.300	4.750	0.169	0.185
A1	1.830 REF		0.072 REF	
A2	2.300	2.850	0.090	0.112
A3	2.500	2.900	0.098	0.114
b	0.400	0.420	0.016	0.016
b1	1.220	1.280	0.048	0.050
C	0.690	0.720	0.027	0.028
c	0.490	0.510	0.019	0.020
D	9.960	10.200	0.392	0.400
E	15.000	15.950	0.588	0.625
e	2.574 TYP		0.101TYP	
F	3.470 REF		0.136 REF	
y	3.200 REF		0.125 REF	
h	0.000	0.300	0.000	0.012
L	28.780	28.900	1.128	1.133
L1	2.990	3.100	0.117	0.122

■ TO - 252 Package Outline Dimensions

