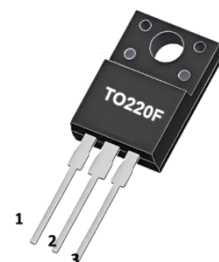
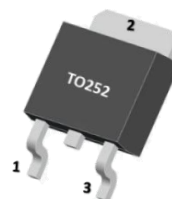


BT151

SCR

■ 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	BT151-5	T _J =25℃	500(Note 2)	V
		BT151-6		650(Note 2)	
		BT151-8		800	
I _{T(AV)}	Average On-State Current（half sine wave;T _c ≤109℃）			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℃ prior to surge)		t=10ms	100	A
			t=8.3ms	110	
I ² t	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℃	0.5	W
P _{GM}	Peak gate Power			5	W
T _J	Operating Junction Temperature			125	℃
T _{stg}	Storage Temperature			-40 to +150	℃

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.

BT151

SCR

■ 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
Latching current	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 $a = \text{form factor} = I_{T(RMS)} / I_{T(AV)}$

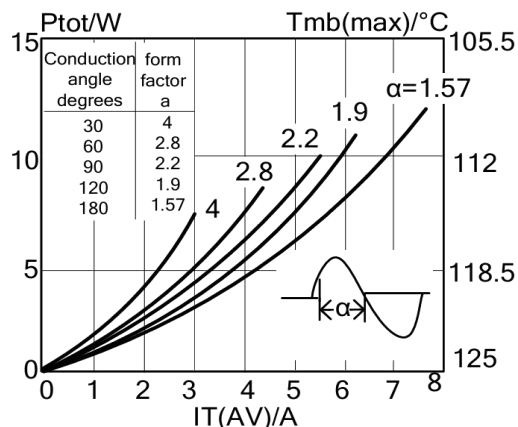


Fig 2. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , Versus Pulse Width t_p for Sinusoidal Currents, $t_p \leq 10ms$

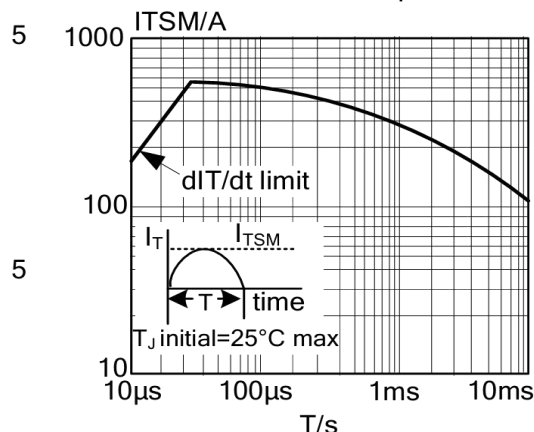


Fig 3. Maximum Permissible Rms Current $I_{T(RMS)}$, Versus Mounting Base Temperature T_{mb}

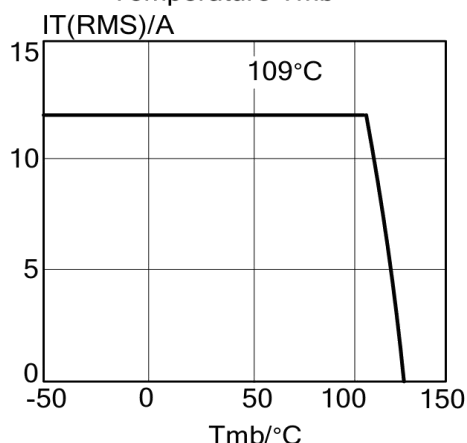


Fig 4. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , Versus Number Of Cycles, For Sinusoidal Currents, $f=50HZ$

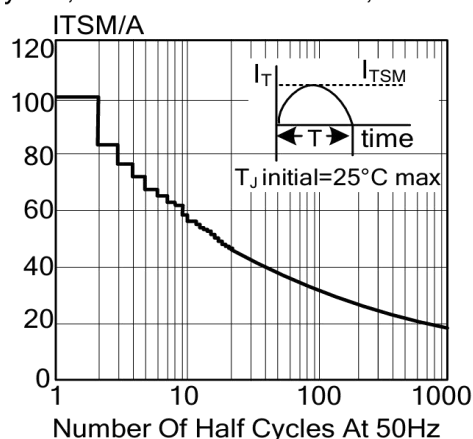


Fig 5. Maximum Permissible Repetitive Rms On-State Current $I_{T(RMS)}$, Versus Surge Duration, For Sinusoidal Currents, $f=50HZ$; $T_{mb} \leq 109^{\circ}C$

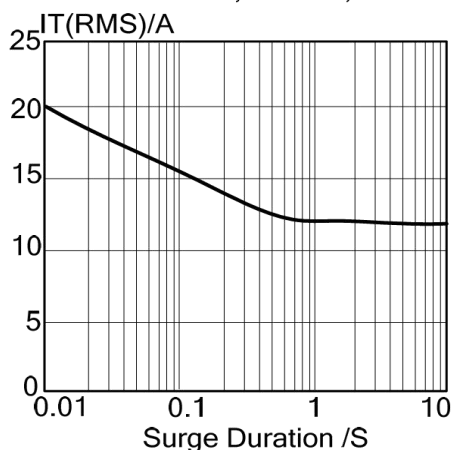
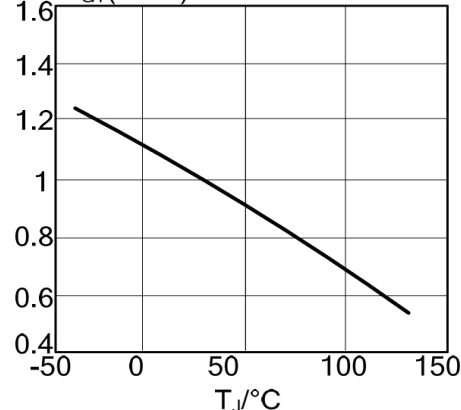


Fig 6. Normalised Gate Trigger Voltage $V_{GT}(T_J)/V_{GT}(25^{\circ}C)$, Versus Junction Temperature T_J



■ TYPICAL CHARACTERISTICS(2)

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

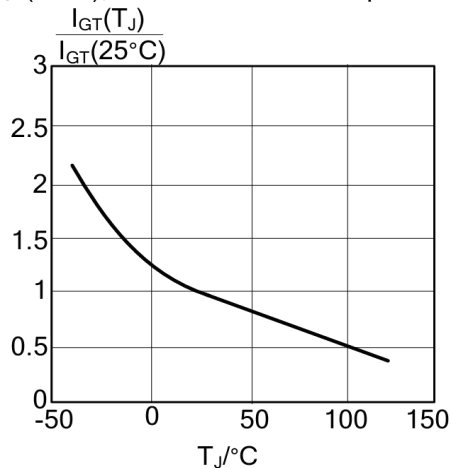


Fig 8. Normalised Latching Current $I_L(T_J)/I_L(25^\circ\text{C})$, Versus Junction Temperature T_J

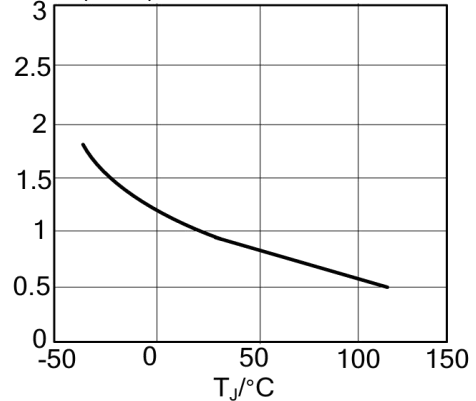


Fig 9. Normalised Holding Current $I_H(T_J)/I_H(25^\circ\text{C})$, Versus Junction Temperature T_J

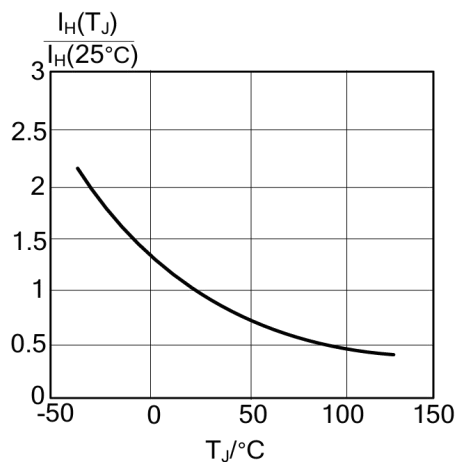


Fig 10. Typical and Maximum On-State Characteristic

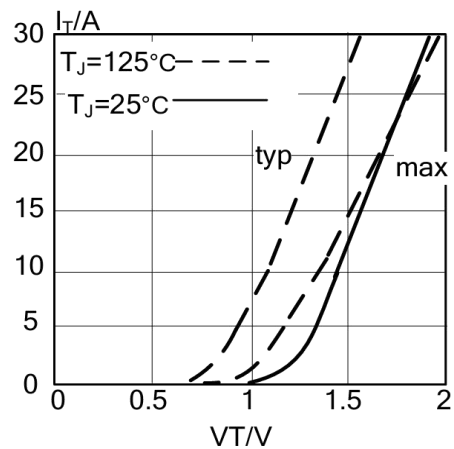


Fig 11. Transient Thermal Impedance Z_{thj-mb} , Versus Pulse Width t_p

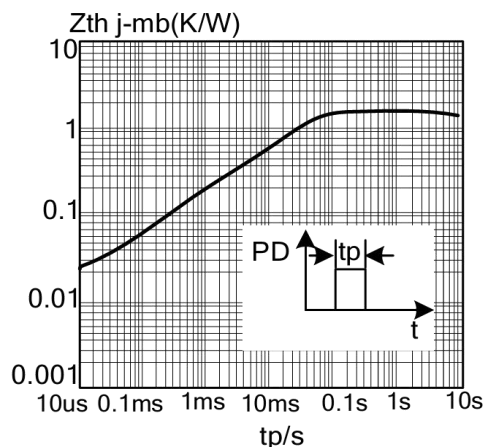
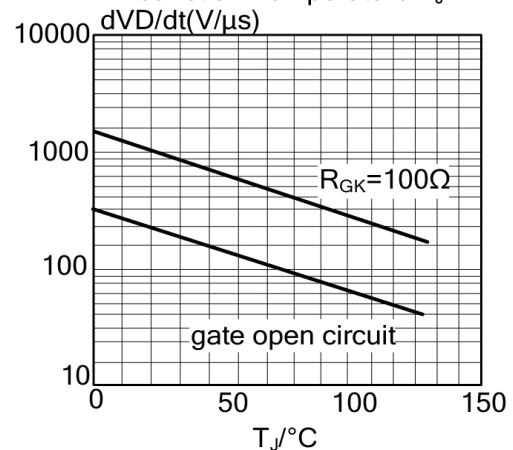
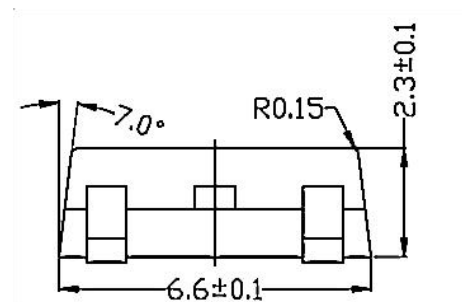
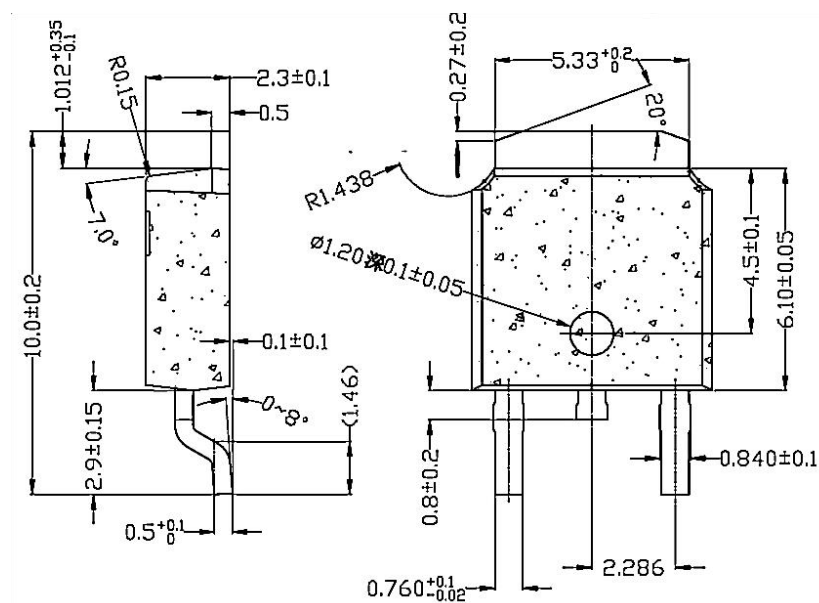


Fig 12. Typical, Critical Rate Of Rise Of Off-State Voltage, dV_D/dt Versus Junction Temperature T_J



■ TO - 252 Package Outline Dimensions



■ TO - 252 Packing Information

Package version	Reel dimensions $\phi \times H$ (mm)	Per Reel (pcs)	Reels per box	Inner box dimensions $L \times W \times H$ (mm)	Outer box (pcs)	Outer box dimensions $L \times W \times H$ (mm)
T0-252	$\phi 330 \times 20$	2500	2	360*340*50	25000	375*375*280