

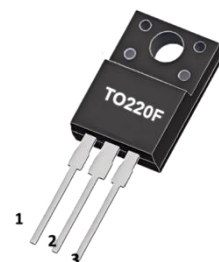
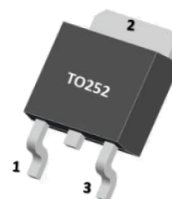
GENERAL DESCRIPTION

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.

MARKING



WPM : LOGO
BT151=Device Code
800E:VDRM/VRRM=800V



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

ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

SYMBOL	PARAMETER		TEST CONDITION	VALUE	UNIT
V _{DRM}	Repetitive Peak off-state voltage	BT151-500E	T _J =25℃	500(Note 2)	V
		BT151-600E		650(Note 2)	
		BT151-800E		800	
I _{T(AV)}	Average On-State Current (half sine wave;T _c ≤109℃)			7.5	A
I _{T(RMS)}	RMS forword 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 .

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 ($T_J=25^{\circ}\text{C}$, 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 $a = \text{form factor} = I_{T(RMS)} / I_{T(AV)}$

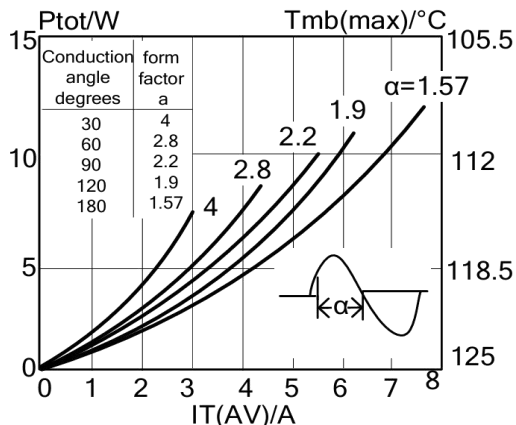


Fig 2. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , Versus Pulse Width t_p for Sinusoidal Currents, $t_p \leq 10\text{ms}$

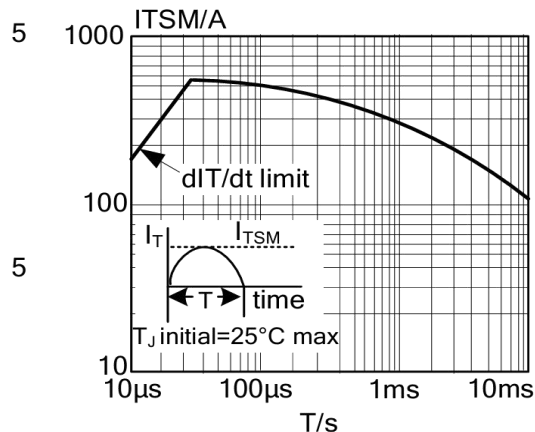


Fig 3. Maximum Permissible Rms Current $I_{T(RMS)}$, Versus Mounting Base Temperature T_{mb}

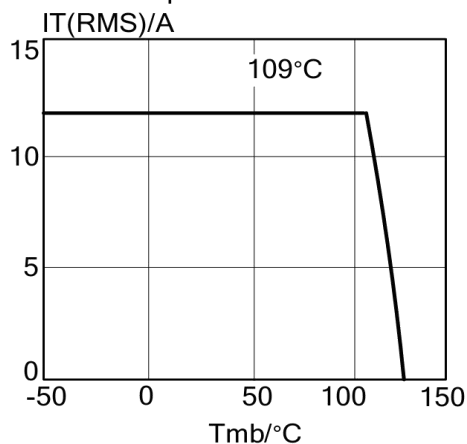


Fig 4. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , Versus Number Of Cycles, For Sinusoidal Currents, $f=50\text{Hz}$

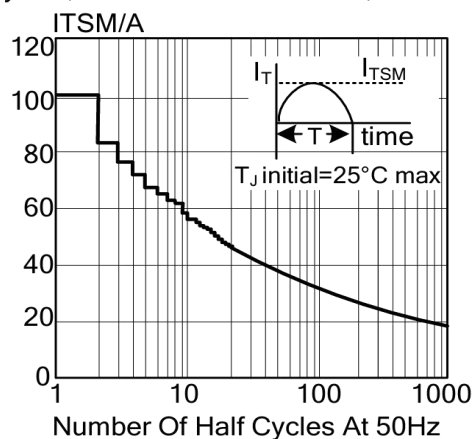


Fig 5. Maximum Permissible Repetitive Rms On-State Current $I_{T(RMS)}$, Versus Surge Duration, For Sinusoidal Currents, $f=50\text{Hz}$; $T_{mb} \leq 109^\circ\text{C}$

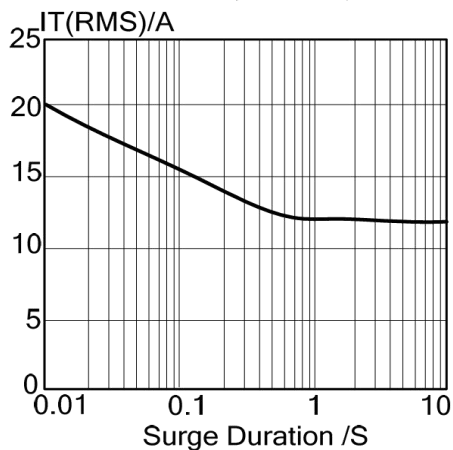
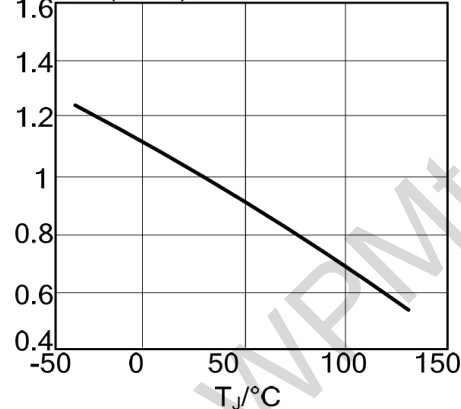


Fig 6. Normalised Gate Trigger Voltage $V_{GT}(T_J) / V_{GT}(25^\circ\text{C})$, Versus Junction Temperature T_J



TYPICAL CHARACTERISTICS(2)

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

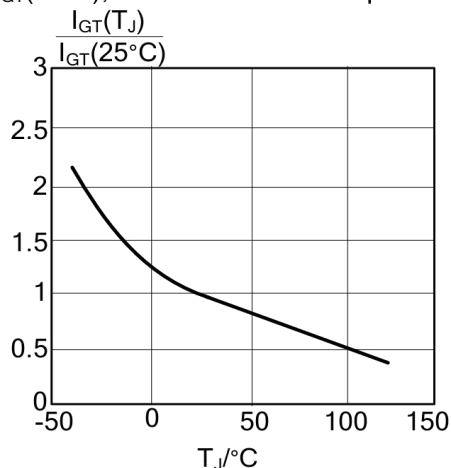


Fig 8. Normalised Latching Current $I_L(T_J)/I_L(25^\circ\text{C})$, Versus Junction Temperature T_J

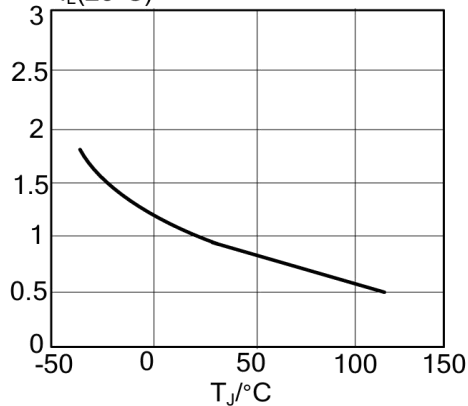


Fig 9. Normalised Holding Current $I_H(T_J)/I_H(25^\circ\text{C})$, Versus Junction Temperature T_J

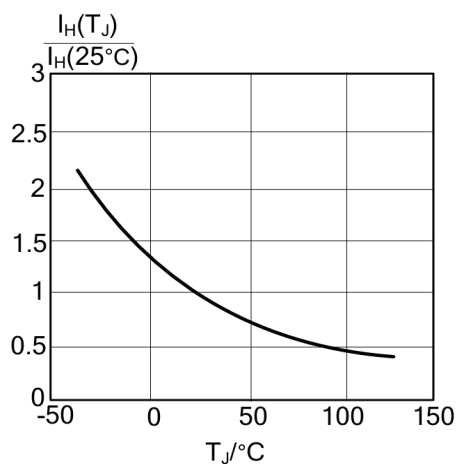


Fig 10. Typical and Maximum On-State Characteristic

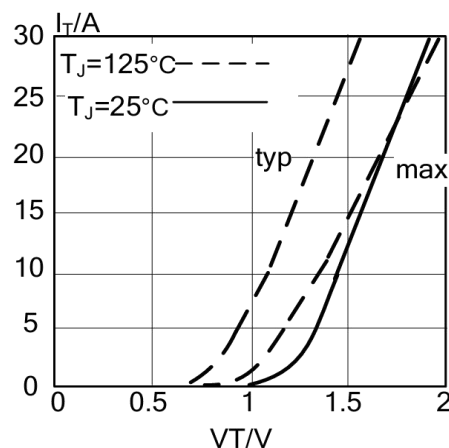


Fig 11. Transient Thermal Impedance Z_{thj-mb} , Versus Pulse Width t_p

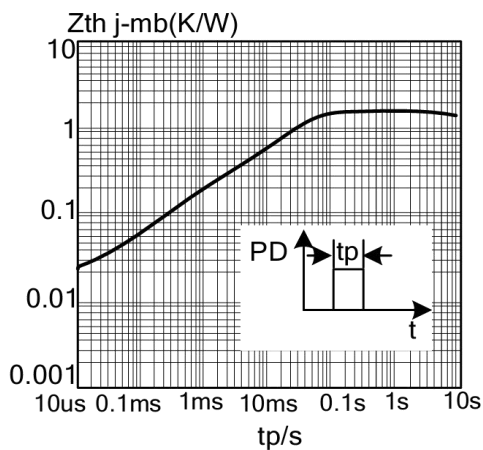
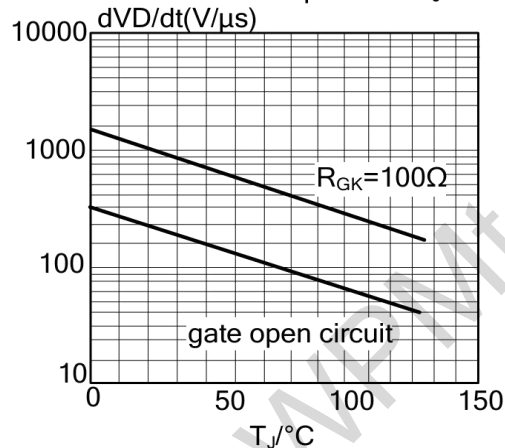
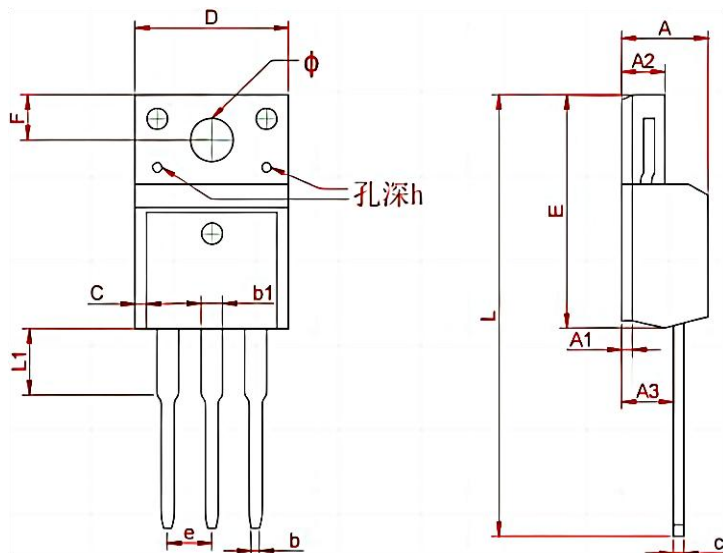


Fig 12. Typical, Critical Rate Of Rise Of Off-State Voltage, dV_D/dt Versus Junction Temperature T_J



TO- 220F Package Outline Dimensions



Symbol	Dimensions In Millimeters	
	Min	Max
A	4.300	4.750
A1	0.7 REF	
A2	2.300	2.850
A3	2.500	2.900
b	0.380	0.420
b1	1.220	1.280
C	1.08	1.200
c	0.480	0.520
D	10.15	10.450
E	15.700	15.950
e	2.574 TYP	
F	3.470 REF	
y	3.200 REF	
h	0.000	0.800
L	28.780	28.900
L1	2.990	3.100

TO - 220F Packing Information



50PCS



20 Tube



5 Inner
Box

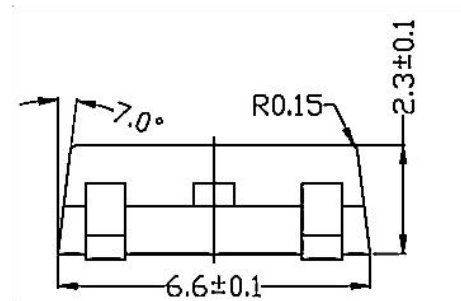
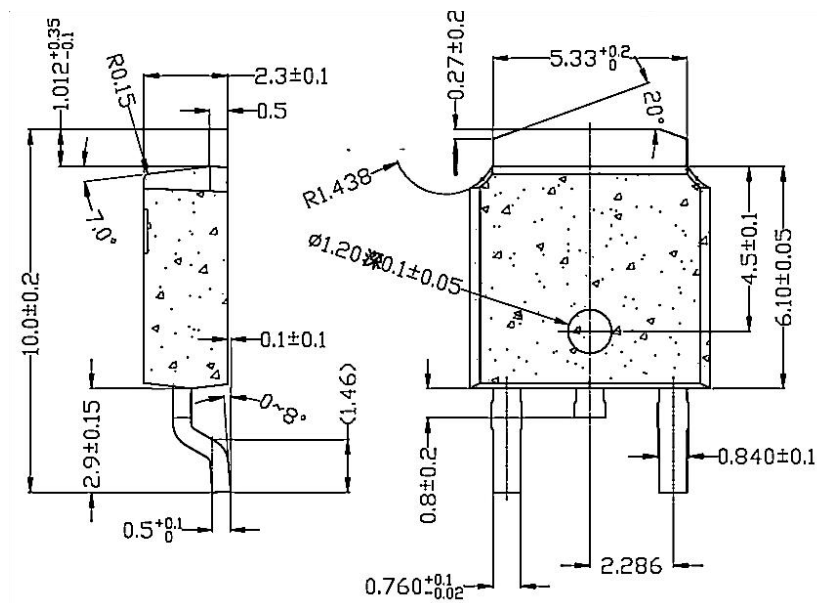


Outer Box

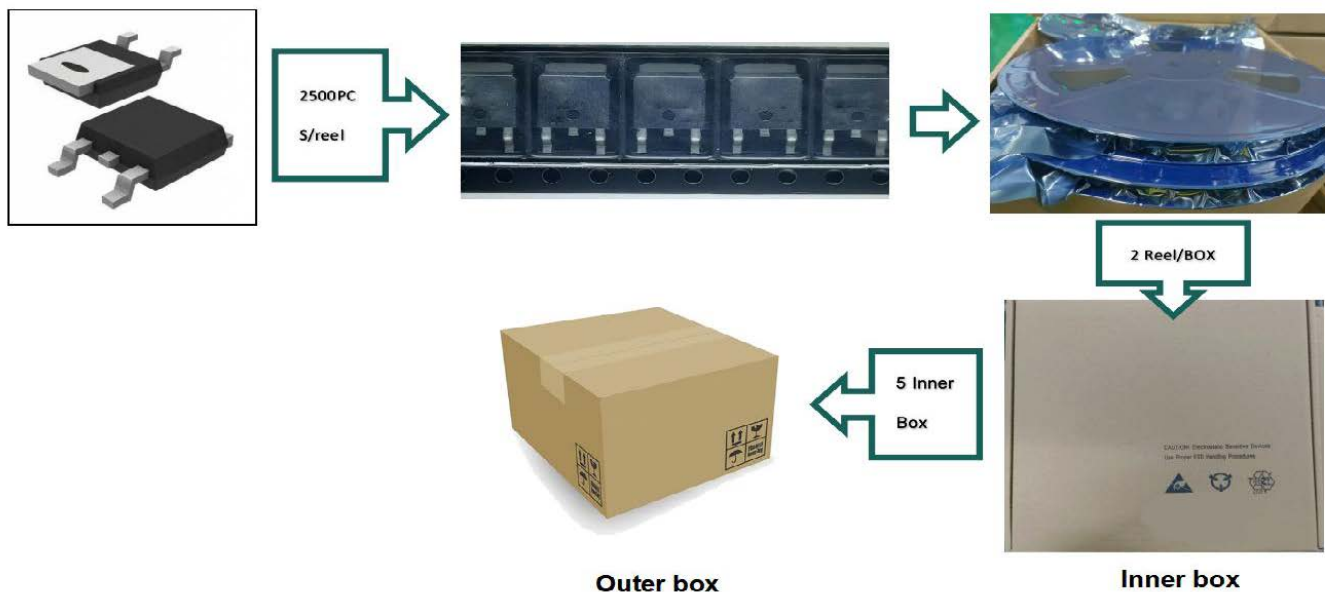
Inner Box

Package version	Tube dimensions LxWxH (mm)	Per Tube (pcs)	Tube per box	Inner box dimensions LxWxH (mm)	PCS/ Inner box	Outer box dimensions LxWxH(mm)	PCS/ Outer box
TO-220F	530*32*7	50	20	580*155*50	1000	602*277*188	5000

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

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