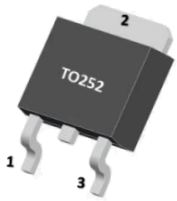
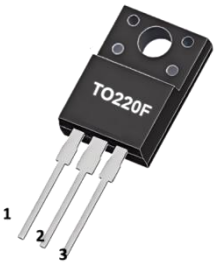
■ GENERAL DESCRIPTION

The BT152 is a thyristor, it uses our advanced technology to provide customers with high bidirectional blocking voltage capability and high thermal cycling performance, etc.

The BT152 is suitable for motor control, industrial, static switching, heating and domestic lighting, etc.





■ FEATURES

* High bidirectional blocking voltage capability
* High thermal cycling performance

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	BT152	T_J=25℃	800	V
$I_{T(AV)}$	Average On-State Current（half sine wave;T_C≤103℃）			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℃ prior to surge)		t=10ms	200	A
			t=8.3ms	220	
I^2t	I^2t for fusing		t=10ms	200	A^2S
dI/dt	Critical rate of rise of on-state current		I_{TM}= 50A; I_G =0.2A; dI_G/dt =0.2A/μs	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 Dissipation (over any 20ms period)		T_J=125℃	0.5	W
T_J	Operating Junction Temperature			125	℃
Tstg	Storage Temperature			-40 to +150	℃

Notes: 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.

■ THERMAL RESISTANCES

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F	RθJA	60	K/W
	TO-252		75	
Junction to Case	TO-220F	RθJC	1.1	K/W
	TO-252		2.3	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
Gate trigger current	I_{GT}	V_D=12V;I_T=0.1A		3	32	mA
Gate trigger voltage	I_L	V_D=12V;I_{GT}=0.1A		25	80	mA
Holding current	I_H	V_D=12V;I_{GT}=0.1A		15	60	mA
On-State Voltage	V_T	I_T=40A		1.4	1.75	V
Gate Trigger Voltage	V_{GT}	V_D=12V;I_T=0.1A		0.6	1.5	V
		V_D=$V_{DRM(max)}$,I_T=0.1A,TJ=125℃	0.25	0.4		
Off-State Leakage Current	I_{DRM}	V_D=$V_{DRM(max)}$,V_R=$V_{RRM(max)}$,		0.2	1.0	mA
	I_{RRM}	TJ=125℃		0.2	1.0	
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of off-state Voltage	dV_D/dt	V_{DM}=67%$V_{DRM(max)}$, T_J=125°C, Exponential Waveform Gate Open Circuit	200	300		V/μs
Gate Controlled Turn-on Time	t_{gt}	V_D=$V_{DRM(max)}$, I_G=0.1A dI_G/dt=5A/μs, I_{TM}=40A		2		μs
Circuit Commutated Turn-Off Time	t_Q	I_{TM}=50A, V_R=25V, R_{GK}=100Ω dI_{TM}/dt=30A/μs, dV_D/dt=50V/μs		70		μs

■ TYPICAL CHARACTERISTICS（1）

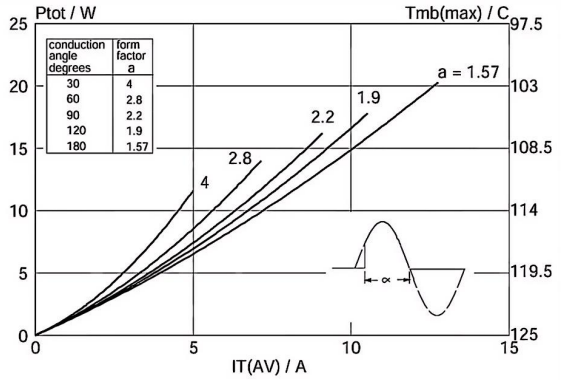


Fig.1. Maximum on-state dissipation, P_{tot}, versus average on-state current, $I_{T(AV)}$, where a = form factor = $I_{T(RMS)}$/ $I_{T(AV)}$.

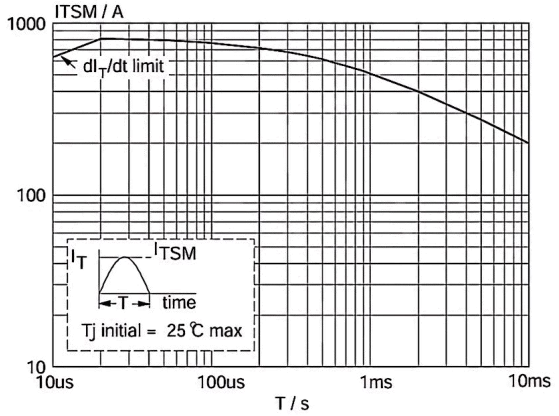


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \leq 10ms$.

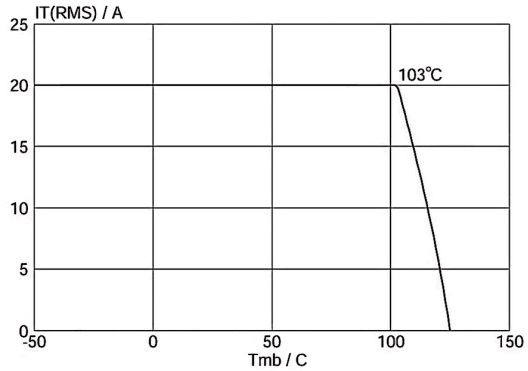


Fig.3. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb}.

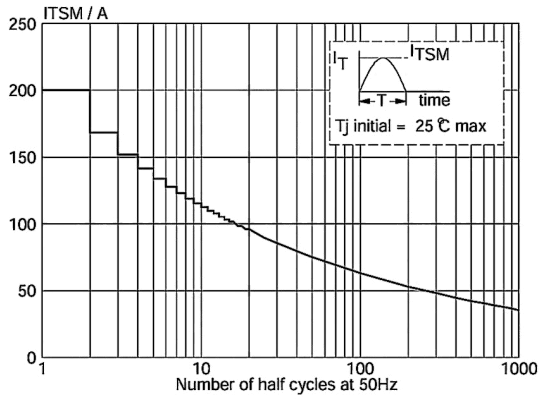


Fig.4. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

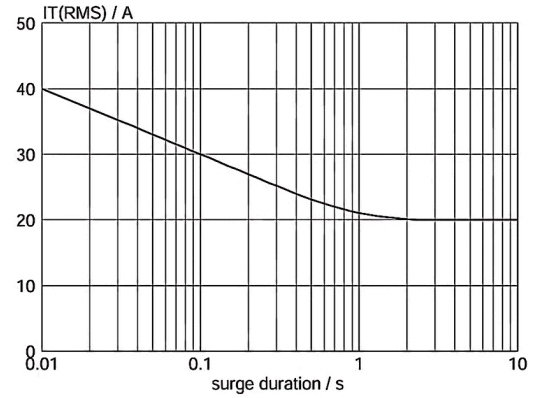


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \leq 103^{\circ}C$.

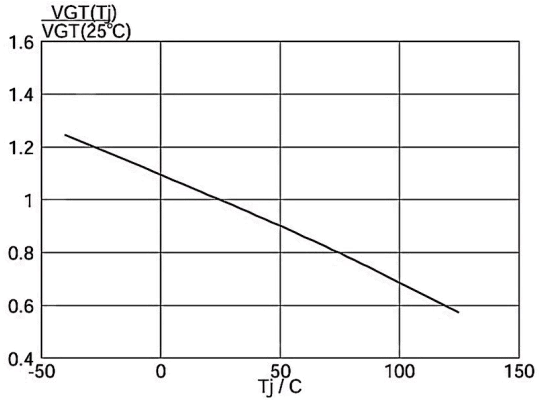


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)$/ $V_{GT}(25^{\circ}C)$, versus junction temperature T_j.

■ TYPICAL CHARACTERISTICS（2）

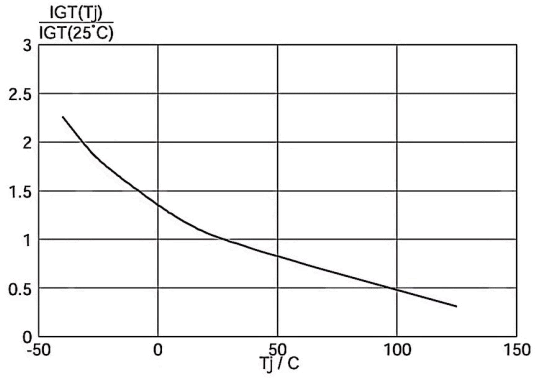


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25^{\circ}C)$, versus junction temperature T_j.

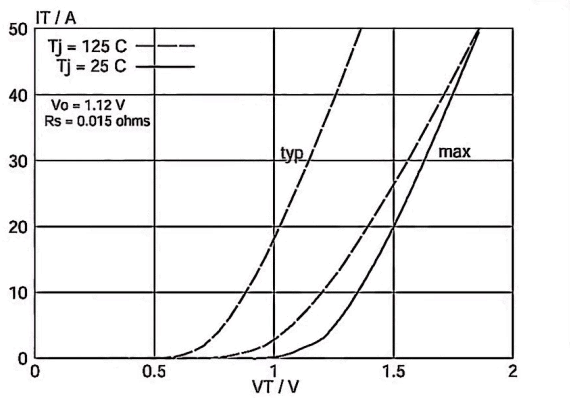


Fig.10. Typical and maximum on-state characteristic.

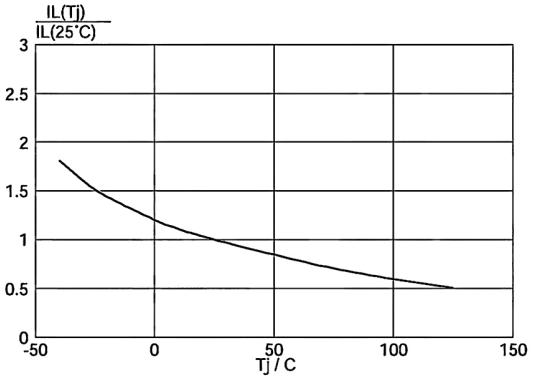


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25^{\circ}C)$, versus junction temperature T_j.

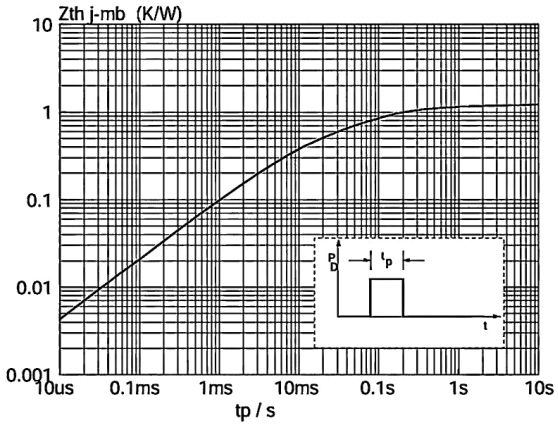


Fig.11. Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p.

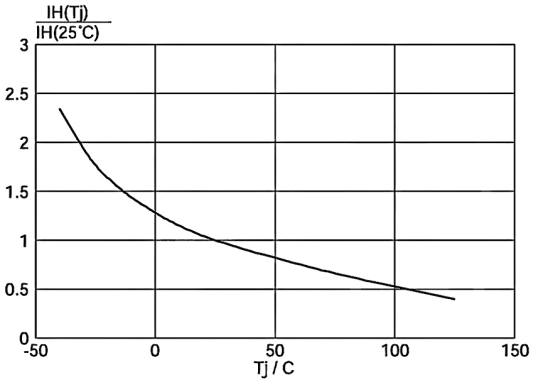


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25^{\circ}C)$, versus junction temperature T_j.

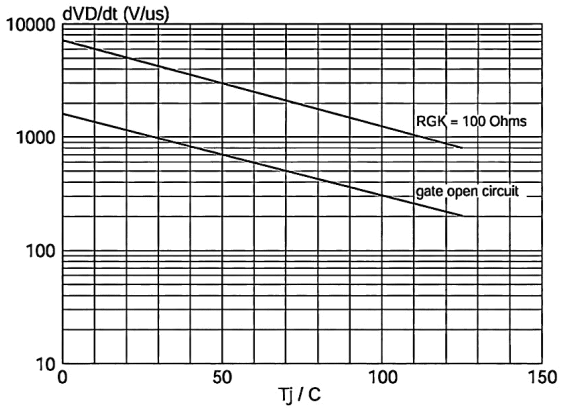
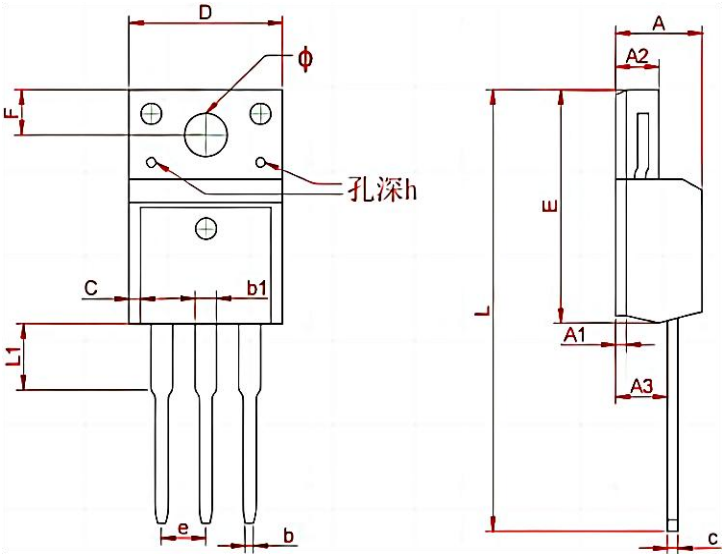


Fig.12. Typical, critical rate of rise of off-state voltage, dV_D/dt versus junction temperature T_j.

■ 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