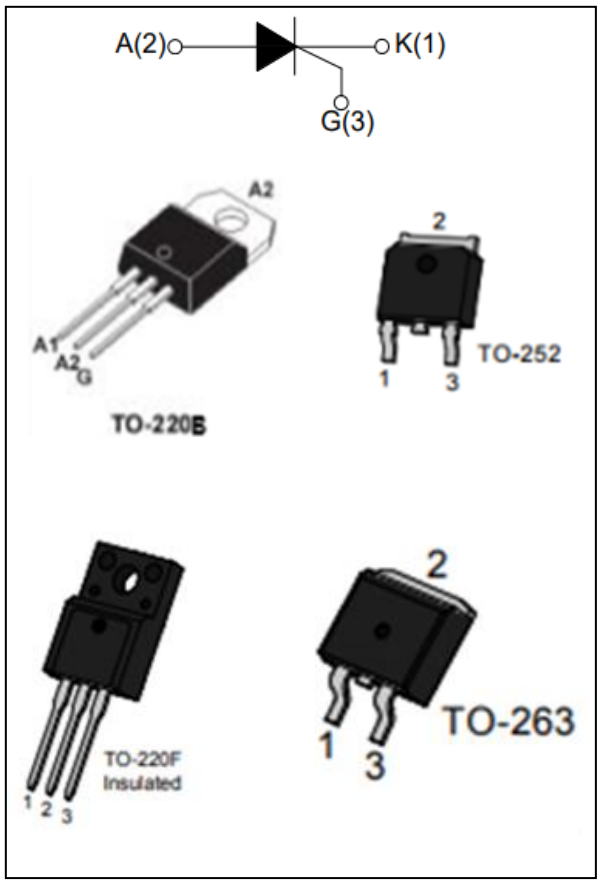
BT152

Silicon Control Rectifiers

●Feature and Application



Features:

-Single side grooving technology with independent intellectual property rights, table glass passivation technology;

-Multi-layer metallized electrode;

-High blocking voltage and high temperature stability

Applications:

Vacuum cleaners, power tools and other motor speed controllers; Solid state relays; Heating controllers (temperature regulation); And other phase control circuits.

●Characteristics

Table 1. Absolute maximum ratings (T_{VJ} = 25℃ unless otherwise stated)

Symbol	Parameter and test conditions			value	Unit
$I_{T(AV)}$	On state average current Tc=125℃ T_{VJ}=150℃			13	A
$I_{T(RMS)}$	RMS on-state current (full sine wave) Tc=105℃			20	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_{VJ} initial = 25℃)	F=50HZ	t=10ms	200	A

I^2t	I^2t value for fusing	t_p=10ms f=50HZ	T_{VJ}=45℃	144	A^2S
（di/dt）cr	Critical rate of rise of on-state current IG = 2 x IGT, tr ≤ 100 ns	T_{VJ}=150℃;f=50Hz		50	A/us
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage	T_{VJ}=25℃		600 800	V
I_{GM}	Peak gate current	t_p=20us T_{VJ}=125℃		4	A
$P_{G(AV)}$	Average gate power dissipation	T_C=150℃		1	W
T_{stg} T_{VJ}	Storage junction temperature range Operating junction temperature range			−40to+150 −40to+125	℃

Table 2. Dynamic electrical characteristics (T_{VJ}=25℃, unless otherwise specified)

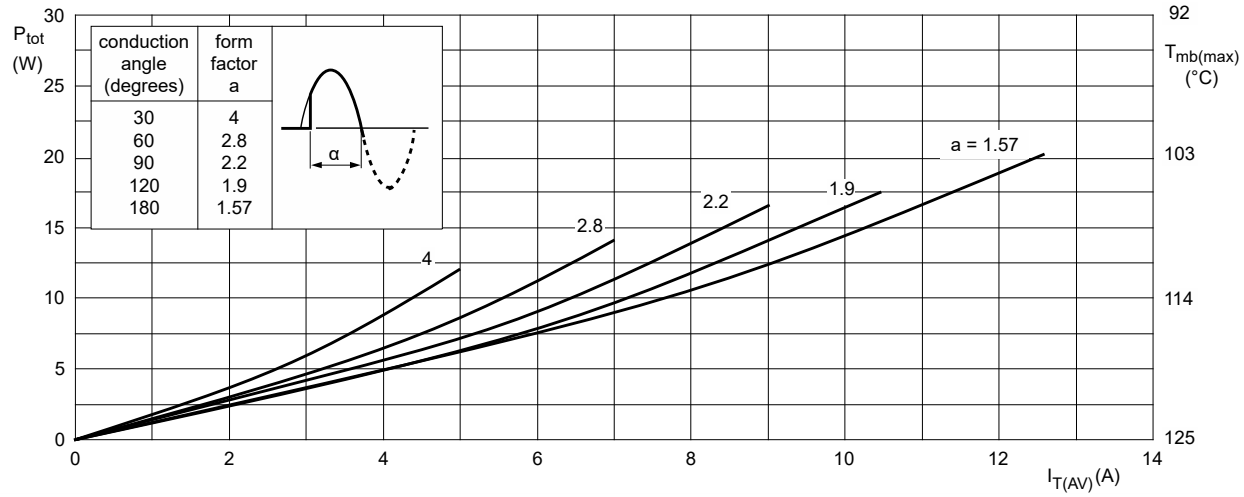
Symbol	Parameter and test conditions		value	Unit
I_{GT}	V_D=12V R_L=100Ω	MAX	15	mA
V_{GT}		MAX	1.5	V
V_{GD}	V_D=⅔V_{DRM} T_{VJ} = 150℃	MAX	0.2	V
I_{GD}			3	mA
I_H	V_D = 12V $R_{GK=\infty}$ T_{VJ} = 25℃	MAX	30	mA
I_L	t_p=10us I_G=0,3A; di_G/dt =0,3A/μs; T_{VJ} = 25℃	MAX	40	mA
t_{gd}	V_D=1/2 V_{DRM} T_{VJ}=25℃ I_G=0,3A; di_G/dt =0,3A/μs	MAX	2	us
t_q	V_R=100V I_T=80A V=2/3V_{DRM} T_{VJ}=125℃ di/dt=20A/us dv/dt=20V/us tp=200us	Typ	200	us
（dv/dt）cr	V_D=2/3V_{DRM} $R_{GK=\infty}$ T_{VJ}=150℃	MAX	200	V/us

Table 3. Static electrical characteristics

Symbol	Parameter and test conditions			value	Unit
V_{TM}	I_{TM}=36A	T_{VJ}=25℃	MAX	1.70	V
V_{T0}	Threshold on-state voltage	T_{VJ}=150℃	MAX	0.86	V
Rd	Dynamic resistance	T_{VJ}=125℃	MAX	36.6	mΩ
$I_{R/D}$	$V_{R/D}$=800V	T_{VJ}=25℃	MAX	5	uA
	$V_{R/D}$=800V	T_{VJ}=125℃		1	mA
$R_{th(j-c)}$	Junction to ambient			1.75	℃/W

Typical Characteristic Curves:

Fig. 1. Total power dissipation as a function of average on-state current; maximum values



a = form factor = $I_{T(RMS)} / I_{T(AV)}$

Fig. 2. RMS on-state current as a function of mounting base temperature; maximum values

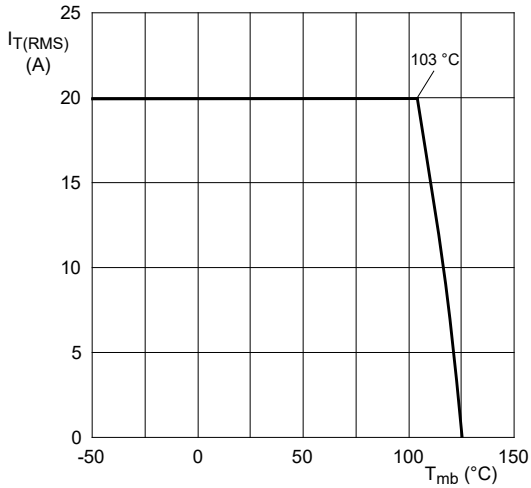
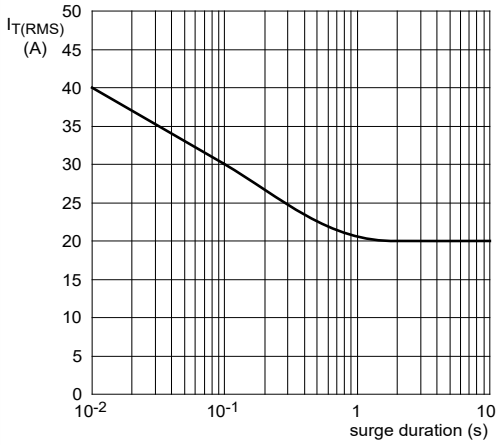
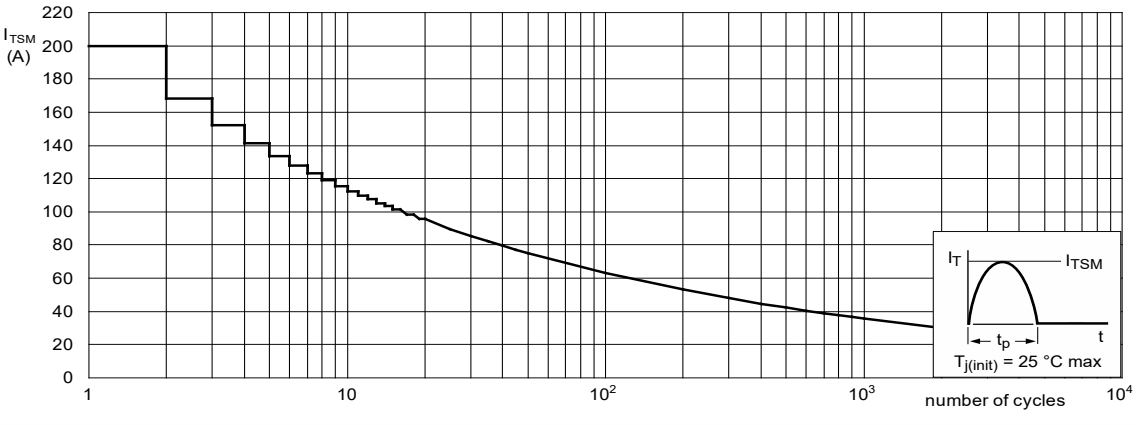


Fig. 3. RMS on-state current as a function of surge duration; maximum values



f = 50 Hz; T = 103 °C

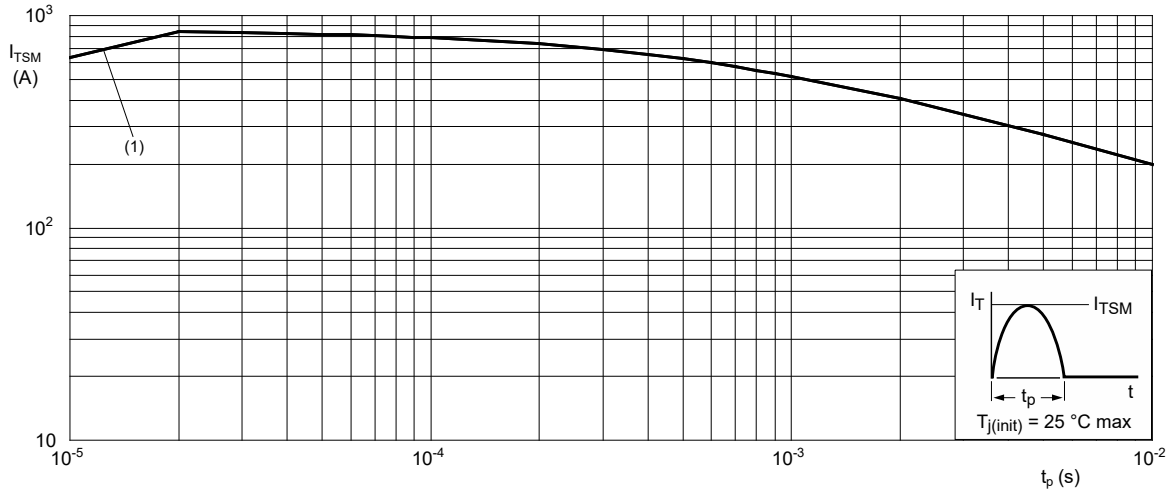
Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values



f = 50 Hz

Typical Characteristic Curves:

Fig. 5. Non-repetitive peak on-state current as a function of pulse width for sinusoidal currents; maximum values



$t_p \leq 10$ ms; (1) dI_T/dt limit

Fig. 6. Normalized gate trigger current as a function of junction temperature

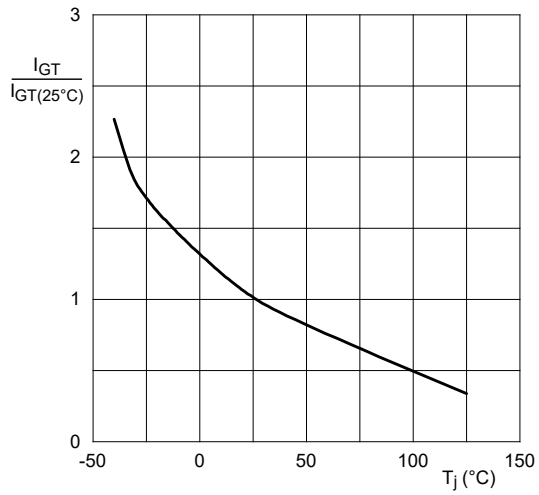
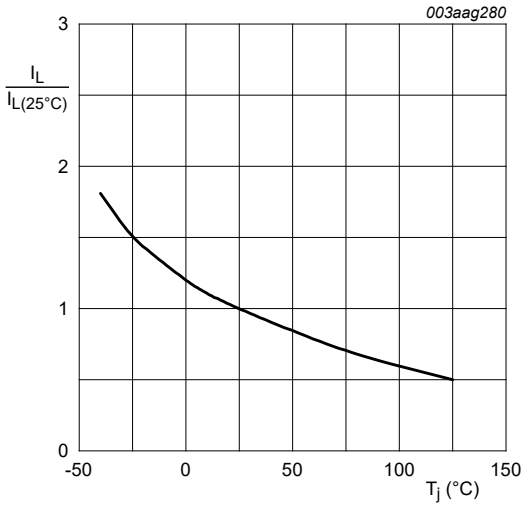


Fig. 7. Normalized latching current as a function of junction temperature



Typical Characteristic Curves:

Fig. 8. Normalized holding current as a function of junction temperature

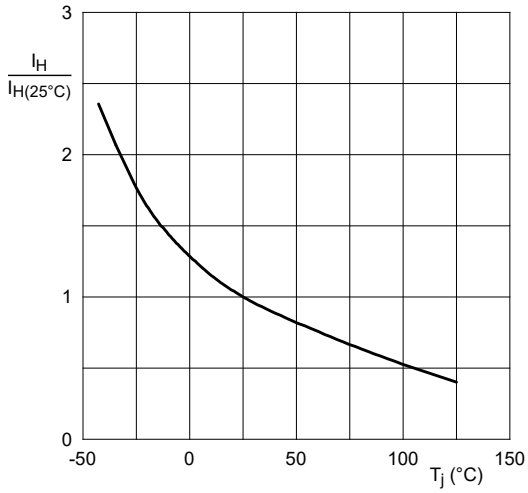
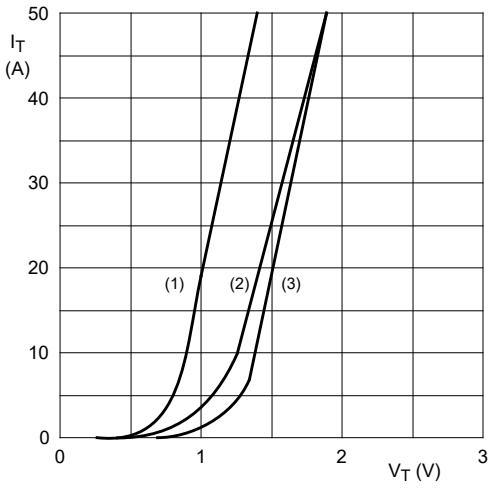


Fig. 9. On-state current as a function of on-state voltage



Vo = 1.06 V; Rs = 0.03 Ω
(1) Tj = 125 °C; typical values
(2) Tj = 125 °C; maximum values
(3) Tj = 25 °C; maximum values

Fig. 10. Normalized gate trigger voltage as a function of junction temperature

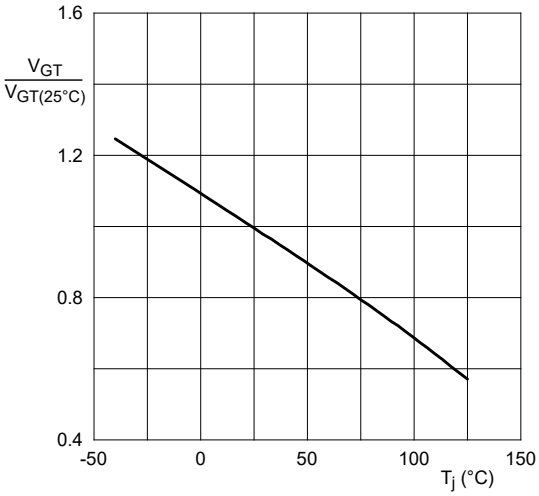
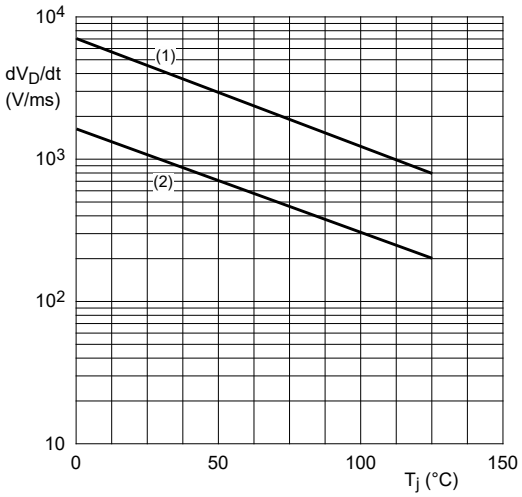


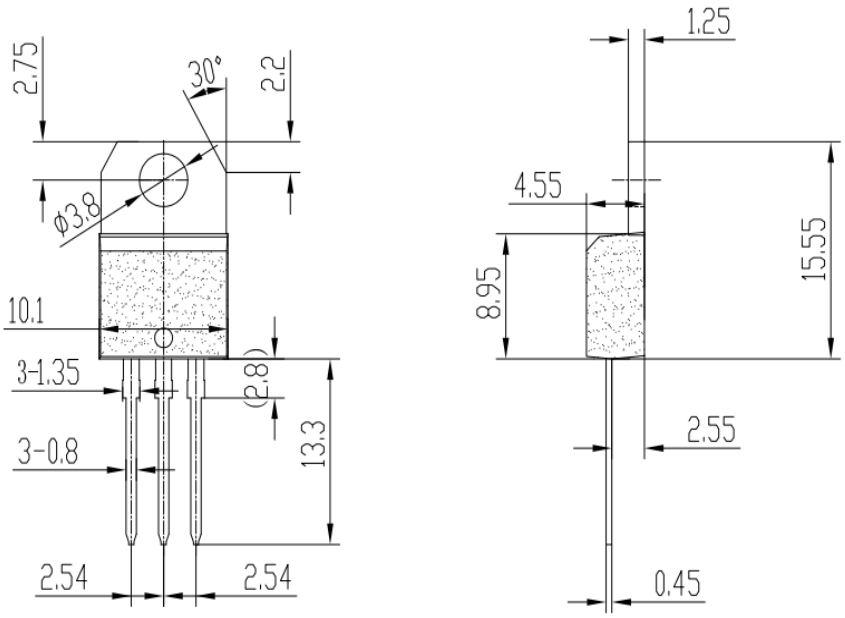
Fig. 11. Critical rate of rise of off-state voltage as a function of junction temperature; typical values



(1) R_{GK} = 100 Ω
(2) Gate open circuit

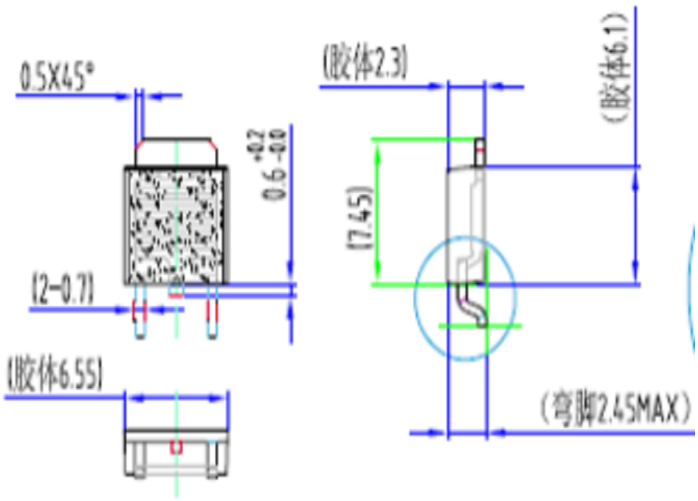
● TO-220 Dimensional drawing:

Unit：mm（±0.1）



● TO-252 Dimensional drawing:

Unit：mm（±0.1）



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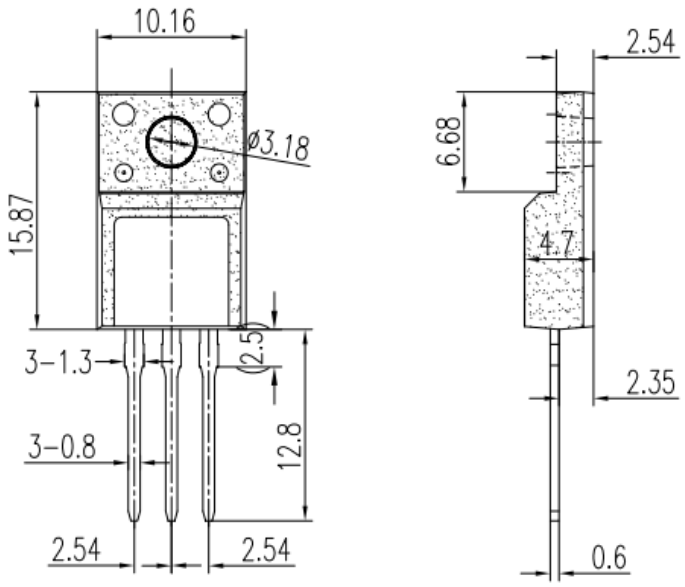
●TO-220F Dimensional drawing:

Unit：mm（±0.1）



●TO-263 Dimensional drawing:

Unit：mm（±0.1）