BT152-400R(600R,800R)G

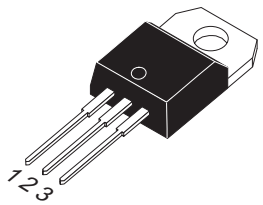
SCRs

Description

Standard gate triggering SCR is fully isolated package suitable for the application where requiring high bidirectional blocking voltage capability and also suitable for over voltage protection, motor control circuit in power tool, inrush current limit circuit and heating control system.

Simplified outline

TO-220AB



Symbol

Features

- Blocking voltage to 800 V
- On-state RMS current to 20 A
- Ultra low gate trigger current

Applications

- Motor control
- Industrial and domestic lighting
- Heating
- Static switching

Pin	Description
1	cathode
2	anode
3	gate
TAB	anode

SYMBOL	PARAMETER		Value	Unit
V_{DRM} V_{RRM}	Repetitive peak off-state voltages Voltages	400RG 600RG 800RG	450 650 800	V
$I_{T\ (RMS)}$	RMS on-state current		20	A
I_{TSM}	Non-repetitive peak on-state current		200	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Rth j-mb	Thermal resistance Junction to mounting base		-	-	1.1	K/W
Rth j-a	Thermal resistance Junction to ambient	In free air	-	60	-	K/W

Limiting values in accordance with the Maximum system(IEC 134)

SYMBOL	PARAMETER	CONDITIONS		MIN	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state Voltages	500RG 650RG 800RG		-	500 650 800	V
I_{TAV}	Average on-state current	Half sine wave;Tmb<=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; Tj = 25℃ prior to surge	T=10ms	-	200	A
			T=8.3ms	-	220	A
I^2t	I^2t for fusing	T=10ms		-	200	A^2S
DI_T/dt	Repetitive rate of vise of on-state current after trigering	I_{TM}=50 A; I_G=0.2 A; D_{IG}/dt=0.2 A/μs		-	200	A/μs
I_{GM}	Peak gate current			-	5	A
V_{GM}	Peak gate voltage			-	5	V
P_{GM}	Peak gate power			-	20	W
$P_{G(AV)}$	Average gate power	Over any 20 ms period		-	0.5	W
T_{stg}	Storage temperature			-40	150	℃
T_j	Operating junction Temperature			-	125	℃

T_J =25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I_{GT}	Gate trigger current	V_D=12V; I_T=0.1A	-	3	32	mA
I_L	Latching current	V_D=12V; I_{GT}=0.1A	-	25	80	mA
I_H	Holding current	V_D=12V; I_{GT}=0.1A	-	15	60	mA
V_T	On-state voltage	I_T=40A	-	1.4	1.75	V
V_{GT}	Gate trigger voltage	V_D=12V;I_T=0.1A V_D=$V_{DRM(max)}$;I_T=0.1A;T_J=125°C	- 0.25	0.6 0.4	1.5 -	V V
I_D	Off-state leakage current	V_D=$V_{DRM(max)}$;V_R=$V_{RRM(max)}$ T_J=125°C	-	0.2	1.0	mA

Dynamic Characteristics

D_{VD}/dt	Critical rate of rise of Off-state voltage	V_{DM}=67% $V_{DRM(max)}$;Tj=125°C; exponential wave form; gate open circuit	200	300	-	V/μs
t_{gt}	Gate controlled turn-on time	I_{TM}=40A;V_D=$V_{DRM(max)}$; I_G=0.1A; DI_G/dt=5A/μs	-	2	-	μs
t_g	Crcuit commutated tum-off time	V_{DM}=67% $V_{DRM(max)}$;Tj=125°C;I_{TM}=50A V_R=25V;dI_{TM}/dt=30A/μS DI_G/dt=50V/μs;R_{GK}=100Ω	-	70	-	μs

Description

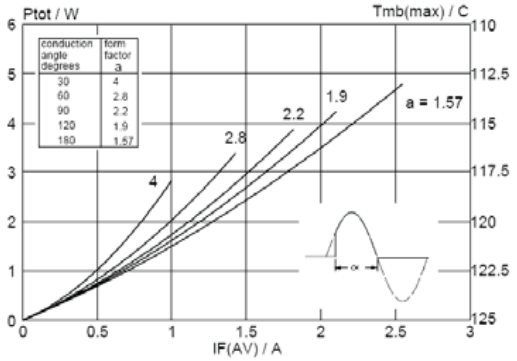


Fig.1. Maximum on-state dissipation, P_{tot}, versus average on-state current, $I_{T(AV)}$, where a = form factor = $I_{T(RMS)}$/ $I_{T(AV)}$.

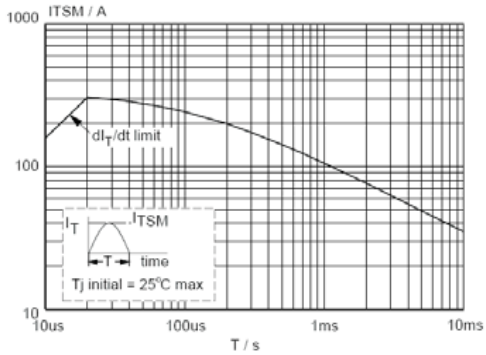


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \leq 10ms$.

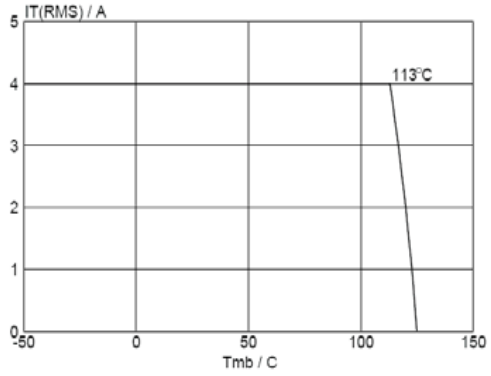


Fig.3. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb}.

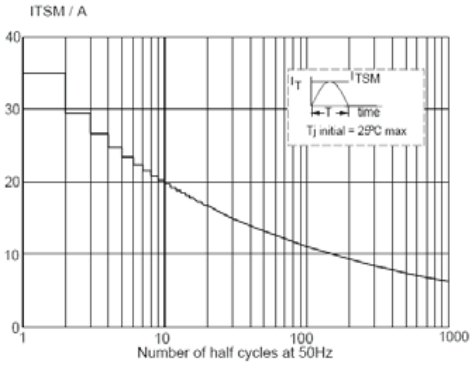


Fig.4. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

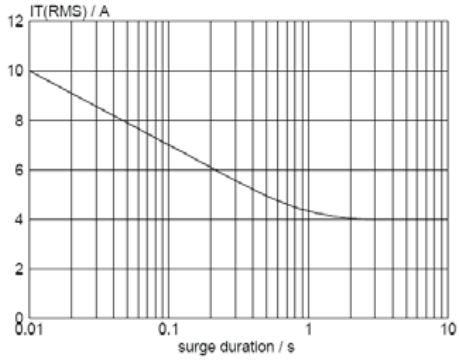


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \leq 113°C$.

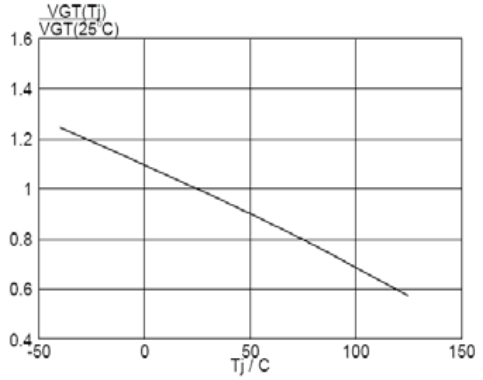


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)$/ $V_{GT}(25°C)$, versus junction temperature T_j.

Description

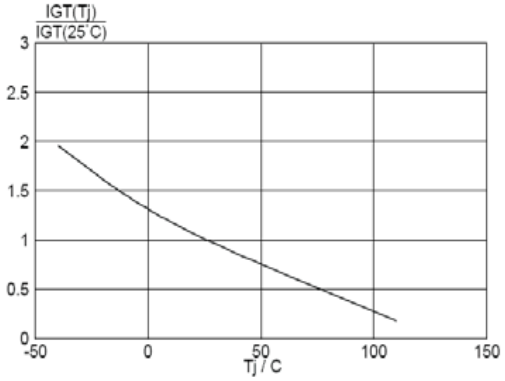


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25°C)$, versus junction temperature T_j.

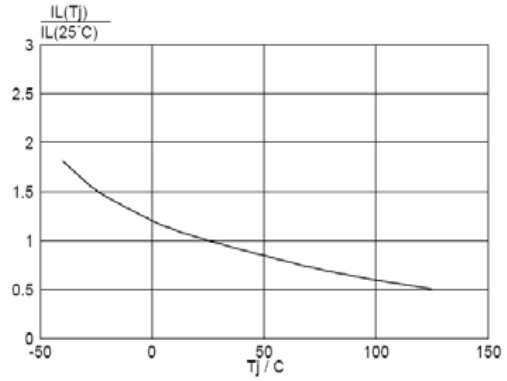


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25°C)$, versus junction temperature T_j.

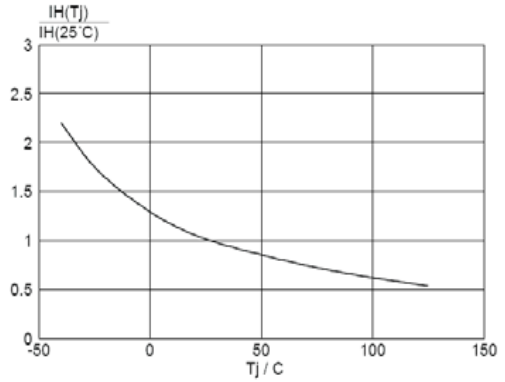


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25°C)$, versus junction temperature T_j.

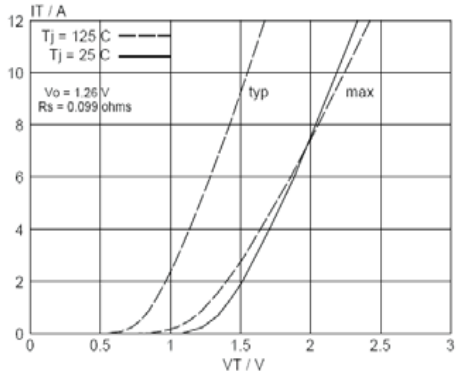


Fig.10. Typical and maximum on-state characteristic.

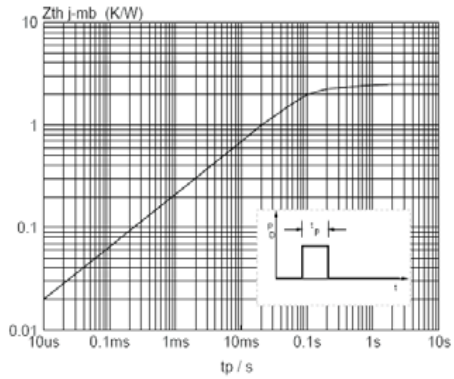


Fig.11. Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p.

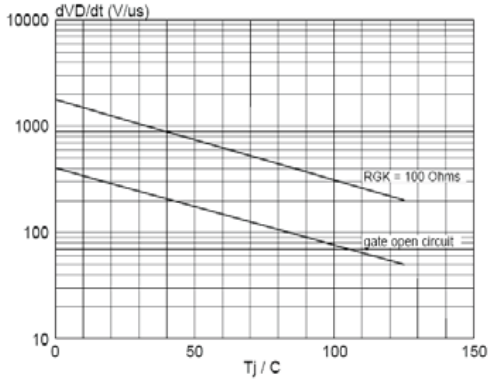
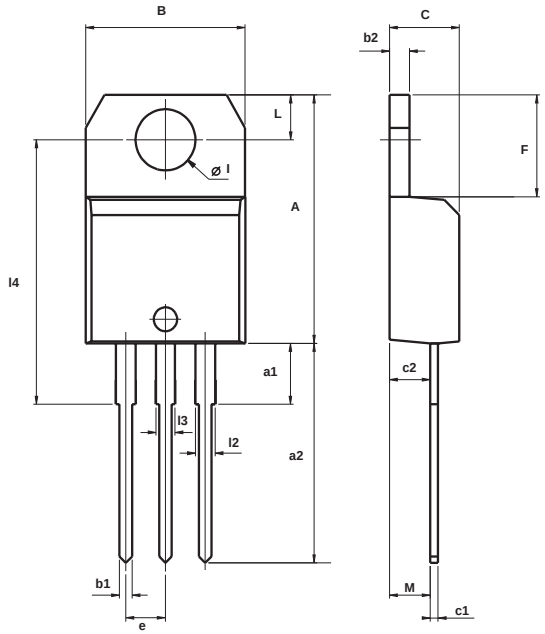


Fig.12. Typical, critical rate of rise of off-state voltage, dV_D/dt versus junction temperature T_j.

Package Mechanical Data

TO-220AB (Plastic)



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
I	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	