



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

It is widely used in the fields of lighting, temperature adjustment, speed regulation, electric tools, massager, solid-state relay, washing machine, vacuum cleaners, AC motor speed regulation and so on.

Mechanical Data

- ◇ Moisture Sensitivity: MSL Level 1, per J-STD-020
- ◇ Terminals: Matte Tin Finish.
Solderable per MIL-STD-202 Method 208
- ◇ Case Material: Molded Plastic;
- ◇ Molding compound meet UL Flammability
Classification Rating 94V-0
- ◇ Case: JEDEC TO-220AB



MAXIMUM RATING

Ratings at 25°C ambient temperature unless otherwise specified.

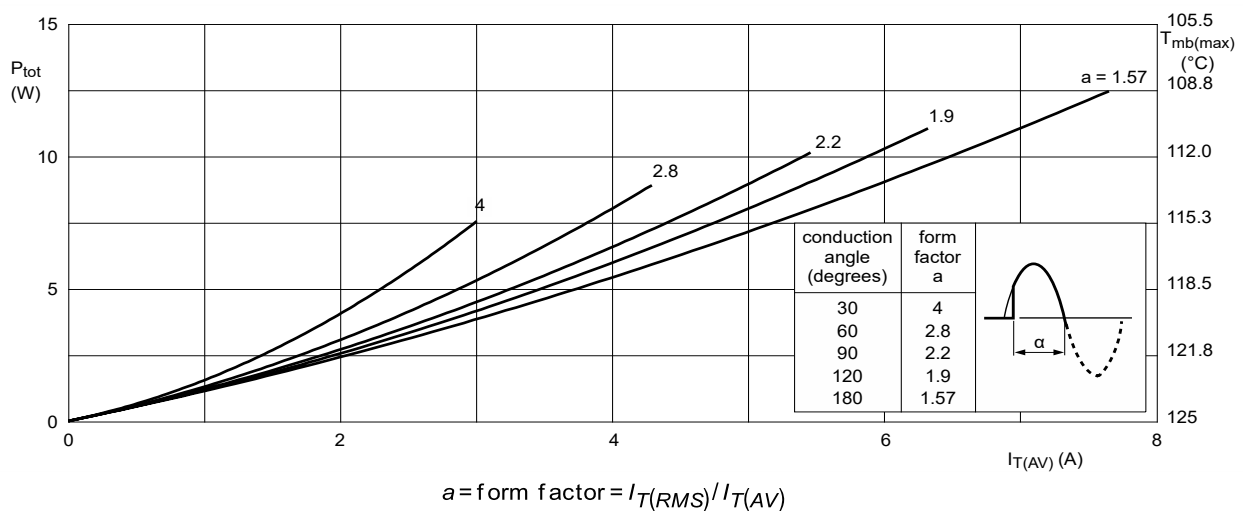
PARAMETER			SYMBOL	VALUE	UNITS
R.M.S. On-State Current		Tc=105°C	I _{T(RMS)}	12	A
On-State average current		Tc=105°C	I _{T(AV)}	7.5A	A
Non-Repetitive Surge Peak On-State Current(Full Cycle, T _j initial=25°C)	F=50HZ	T=10ms	I _{TSM}	120	A
	F=60HZ	T=8.3ms		132	
I ² t Value for Fusing		tp=10ms	I ² t	72	A ² s
Critical Rate of Rise of On-State Current		F=120HZ T _j =125°C	di/dt	50	A/μs
Repetitive peak Off-State voltage		T _j =25°C	V _{DRM} /V _{RRM}	500/600/800	V
Non repetitive surge peak off-state voltage		tp=10ms T _j =25°C	V _{DSM} /V _{RSM}	V _{DRM} /V _{RRM} +100	V
Peak Gate Current		tp=20μs T _j =125°C	I _{GM}	5	A
Peak Gate Current		tp=20μs T _j =125°C	V _{GM}	5.0	V
Peak Gate Power Dissipation		T _j =125°C	P _{GM}	20	W
Average Gate Power Dissipation		T _j =125°C	P _{G(AV)}	1.0	W
Typical Thermal Resistance(Junction to Ambient)		TO-220AB	R _{θJA}	55	°C/W
Typical Thermal Resistance(Junction to Case (AC))		TO-220AB	R _{θJC}	1.1	°C/W
Operating Junction temperature			T _J	-40~+125	°C
Storage temperature range			T _{STG}	-40~+150	°C


ELECTRICAL CHARACTERISTICS(T_j=25°C unless otherwise specified)

PARAMETER	TEST CONDITIONS	SYMBOL		VALUE	UNITS
Gate Trigger Current	V _D =12V, I _T =0.1A	I _{GT}	MAX	15	mA
Gate Trigger Voltage	V _D =12V, R _L =30 Ω	V _{GT}	MAX	1.5	V
Gate Non-Trigger Voltage	V _D =V _{DRM} , T _j =125°C, R _L =3.3K Ω, R _{GK} =1K Ω	V _{GD}	MIN	0.25	V
Holding Current	I _T =0.1A	I _H	MAX	20	mA
Latching Current	I _T =1.2I _{GT}	I _L	MAX	40	mA
Critical rate of rise of on-state current	T _j =125°C, I _G =2×I _{GT} , t _r ≤100ns	di/dt	MIN	50	A/ μ s
Critical Rate of Rise of Off-State Voltage	V _D =2/3V _{DRM} , T _j =125°C	dv/dt	MIN	500	V/ μ s
Critical Rate of Rise of Off-State Voltage at Commutation, T _j =125°C		(dv/dt) _c	MIN	10	V/ μ s

STATIC CHARACTERISTICS

PARAMETER	TEST CONDITIONS	SYMBOL		VALUE	UNITS
Peak On-State Voltage	I _T =23A, t _p =380 μ s	V _{TM}	MAX	1.7	V
Threshold Voltage	T _j =125°C	V _{TO}	MAX	0.87	V
Dynamic Resistance	T _j =125°C	R _d	MAX	36.6	m Ω
Repetitive Peak Off-State Current V _D =V _{DRM}	T _j =25°C	I _{DRM}	MAX	10	μ A
	T _j =125°C			1	mA
Repetitive Peak Off-State Current V _R =V _{RRM}	T _j =25°C	I _{RRM}	MAX	10	μ A
	T _j =125°C			1	mA

RATING AND CHARACTERISTICS CURVES

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

RATING AND CHARACTERISTICS CURVES

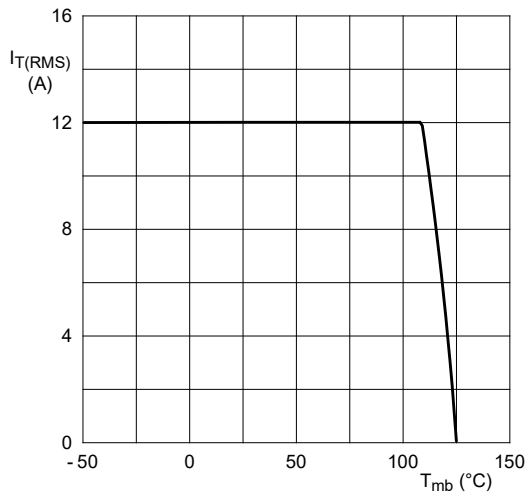


Fig. 2. RMS on-state current as a function of mounting base temperature; maximum values

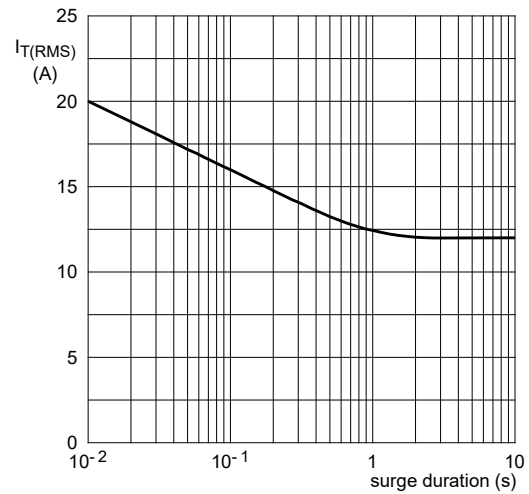


Fig. 3. RMS on-state current as a function of surge duration; maximum values

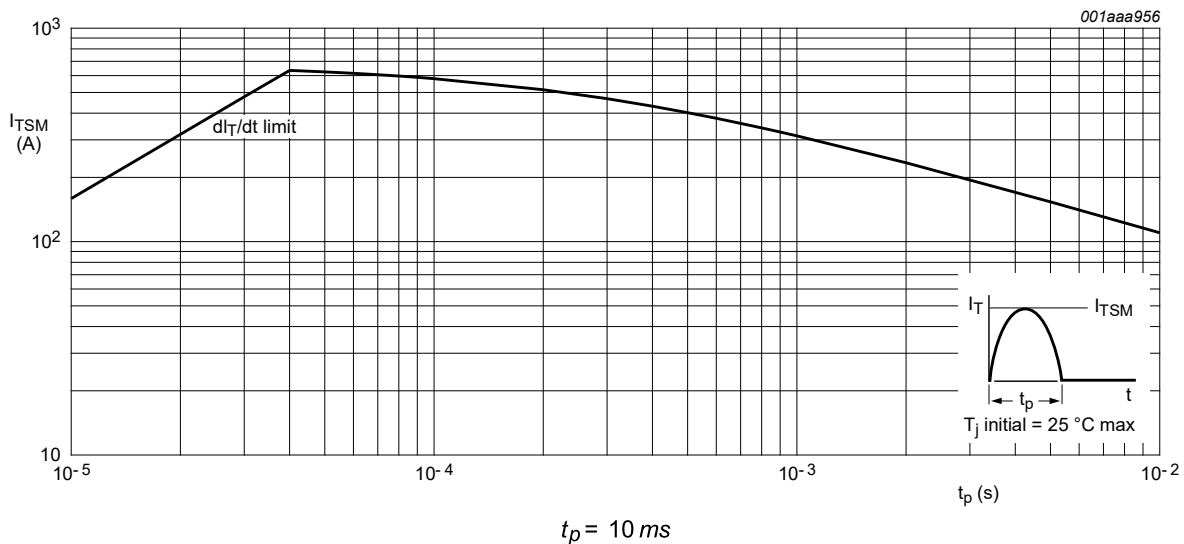


Fig. 4. Non-repetitive peak on-state current as a function of pulse width for sinusoidal currents; maximum values

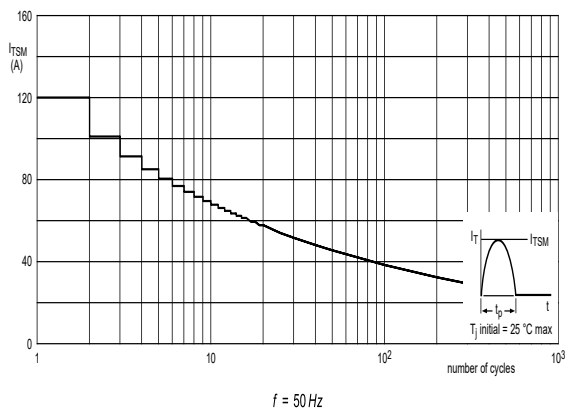


Fig. 5. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

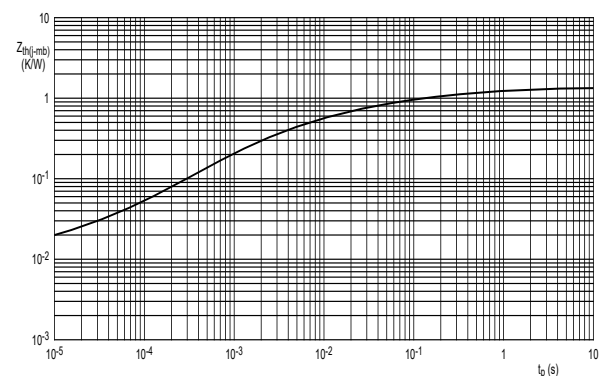


Fig. 6. Transient thermal impedance from junction to mounting base as a function of pulse width

RATING AND CHARACTERISTICS CURVES

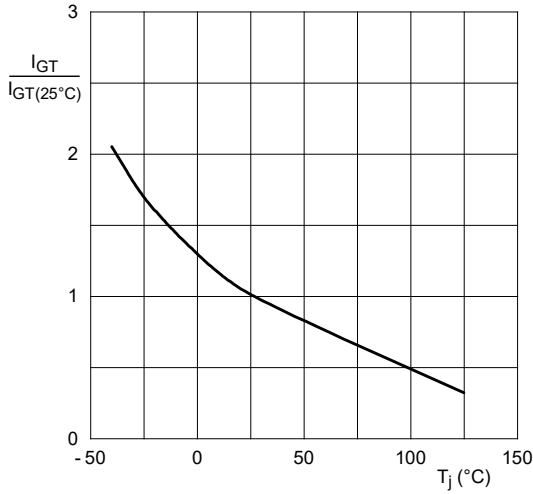


Fig. 7. Normalized gate trigger current as a function of junction temperature

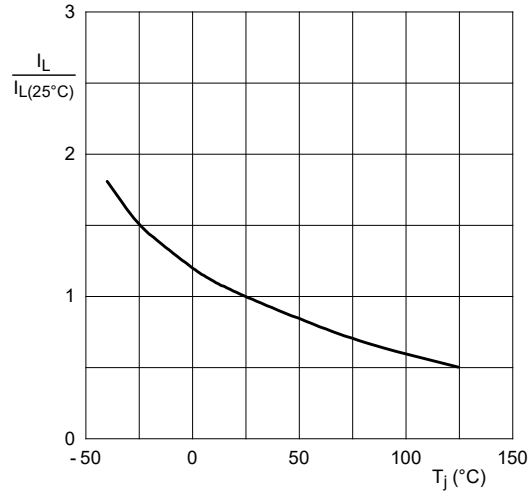


Fig. 8. Normalized latching current as a function of junction temperature

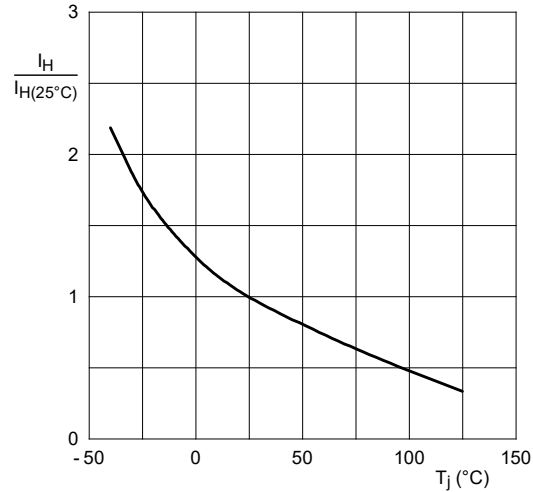
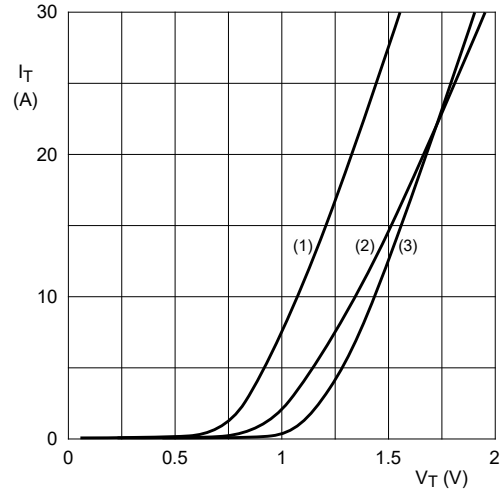


Fig. 9. Normalized holding current as a function of junction temperature



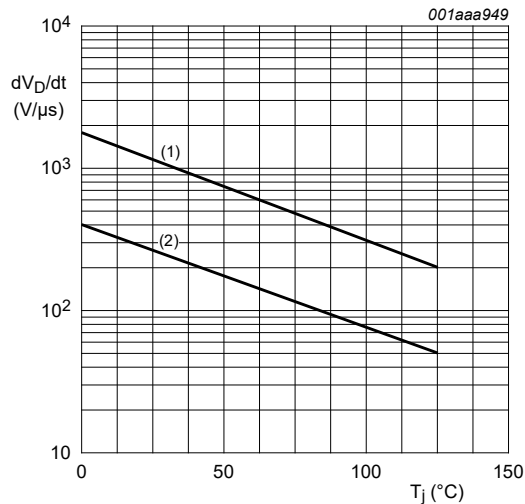
$V_o = 1.06 \text{ V}; R_s = 0.0304 \Omega$

(1) $T_j = 125^\circ\text{C}$; typical values

(2) $T_j = 125^\circ\text{C}$; maximum values

(3) $T_j = 25^\circ\text{C}$; maximum values

Fig. 10. On-state current as a function of on-state voltage



(1) $R_{GK} = 100 \Omega$;
(2) gate open circuit

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

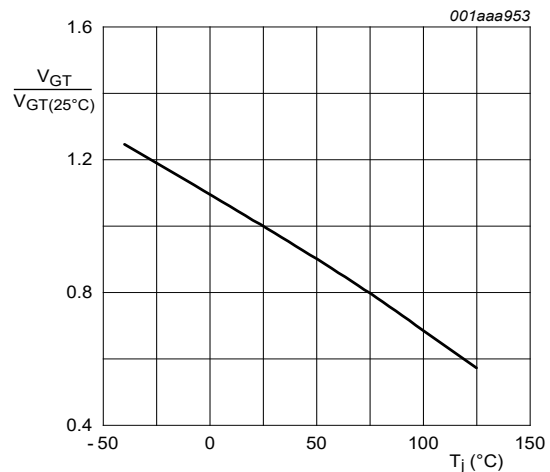
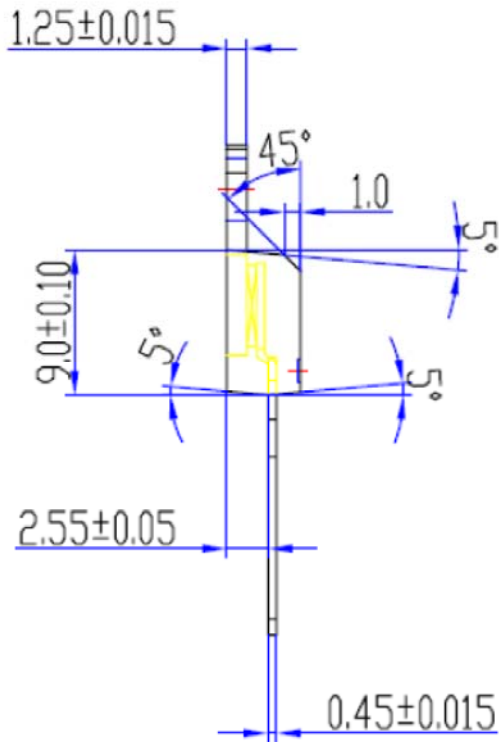
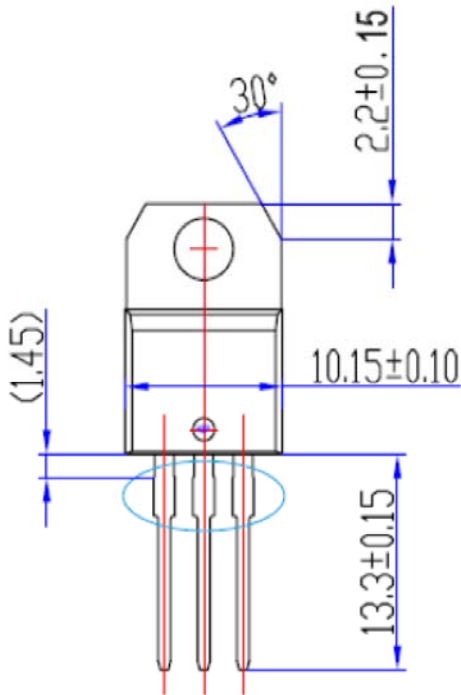


Fig. 12. Normalized gate trigger voltage as a function of junction temperature

PACKAGE OUTLINE DIMENSIONS

TO-220AB



Ordering Information

BT 151 - 500 - R

SCR

Current

$I_{T(RMS)}=12A$

Voltage

500=500V

600=600V

800=800V

Sensitivity and Type

R=15mA