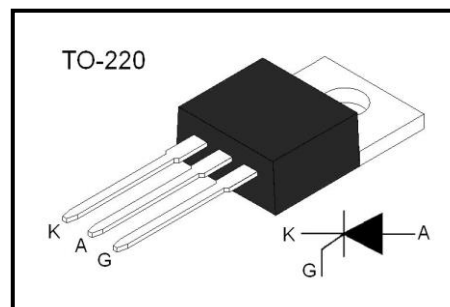


Applications

Glasspassivated 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.



Absolute Maximum Rating ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Repetitive peak off-state voltage	$V_{\text{DRM}}, V_{\text{RRM}}$	BT151-500	500	V
		BT151-600	600	
		BT151-800	800	
Average on-state current	$I_{\text{T(AV)}}$		7.5	A
RMS on-state current	$I_{\text{T(RMS)}}$	full sine wave; $T_{\text{mb}} \leq 103^\circ\text{C}$	12	A
Non-repetitive peak on-state current	I_{TSM}	full sine wave; $T_j = 25^\circ\text{C}$ prior to surge	$t = 10\text{ ms}$ 100	A
			$t = 8.3\text{ ms}$ 110	
I^2t for fusing	I^2t	$t = 10\text{ ms}$	50	A^2/s
Peak gate current	I_{GM}		4	A
Peak gate voltage	V_{GM}		5	V
Peak reverse gate voltage	V_{RGM}		5	V
Average gate power	$P_{\text{G(AV)}}$	over any 20 ms period	0.5	W
Operating Junction Temperature Range	T_j		125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}		$-40 \sim +150$	$^\circ\text{C}$

Note:

- 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 $15\text{A}/\mu\text{s}$.
- 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 Characteristics

Parameter	Symbol	Ratings	Unit
Junction to Mounting Base	$R_{\theta\text{JMb}}$	1.3	$^\circ\text{C} / \text{W}$
Junction to Ambient	$R_{\theta\text{JA}}$	60	$^\circ\text{C} / \text{W}$

Static Characteristics ($T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Gate trigger current	I_{GT}	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$		2	15	mA
Latching current	I_L	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$			40	mA
Holding current	I_H	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$	-		20	mA
On-state voltage	V_T	$I_T = 12\text{ A}$	-		1.75	V
Gate Trigger Voltage	V_{GT}	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$ $V_D = V_{DRM}; I_T = 0.1\text{ A}$	- 0.25		1.5 -	V
Off-state leakage current	I_D	$V_D = V_{DRM(max)}; T_j = 125\text{ }^{\circ}\text{C}$	-		0.5	mA
Reverse current	I_R	$V_D = V_{DRM(max)}; T_j = 125\text{ }^{\circ}\text{C}$	-		0.5	mA

Dynamic Characteristics ($T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Critical rate of rise of off-state voltage	dV_D/dt	$V_{DM}=67\%V_{DRM(max)}; T_j=125^{\circ}\text{C};$ exponential waveform;	Gate open $R_{GK} = 100\Omega$	50 200		V/ μs
Gate controlled turn-on time	t_{gt}	$I_{TM} = 40\text{ A}; V_D = V_{DRM(max)}; I_G = 0.1\text{ A};$ $dI_G/dt = 5\text{ A}/\mu\text{s}$		2		μs
Circuit commutated turn-off time	t_q	$V_D = 67\% V_{DRM(max)}; T_j = 125\text{ }^{\circ}\text{C};$ $I_{TM} = 20\text{ A}; V_R = 25\text{ V}; dI_{TM}/dt = 30\text{ A}/\mu\text{s};$ $dV_D/dt = 50\text{ V}/\mu\text{s}; R_{GK} = 100\Omega$	-	70		μs

Typical Characteristics

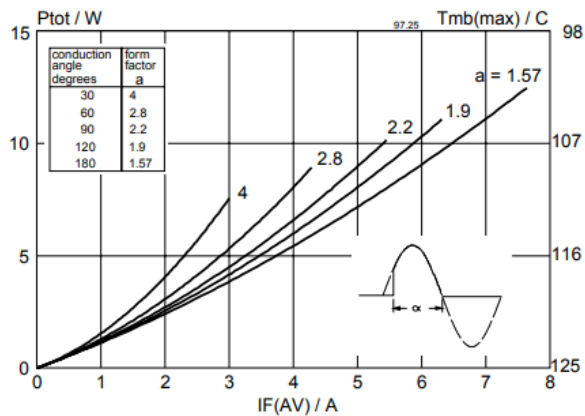


Fig.1. Maximum on-state dissipation, P_{tot} , vs $I_{T(AV)}$, where $a = \text{form factor} = I_{T(RMS)} / I_{T(AV)}$

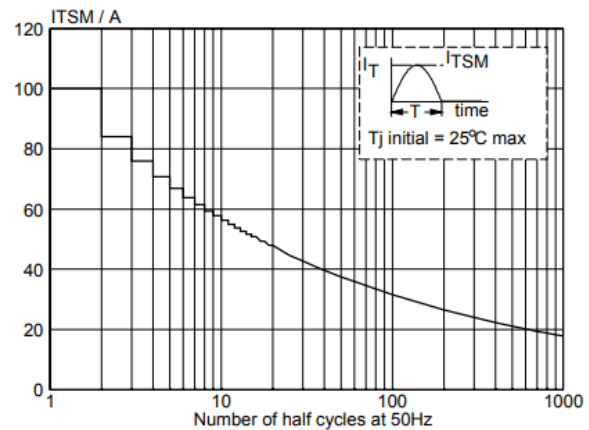


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , vs number of cycles, for sinusoidal currents, $f = 50 \text{ Hz}$.

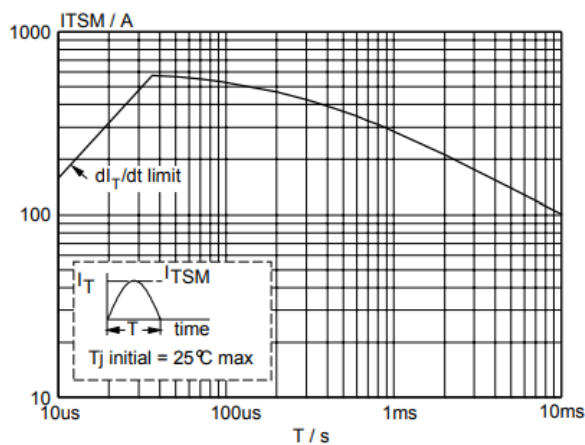


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , vs pulse width t_p , for sinusoidal currents, $t_p \leq 10 \text{ ms}$

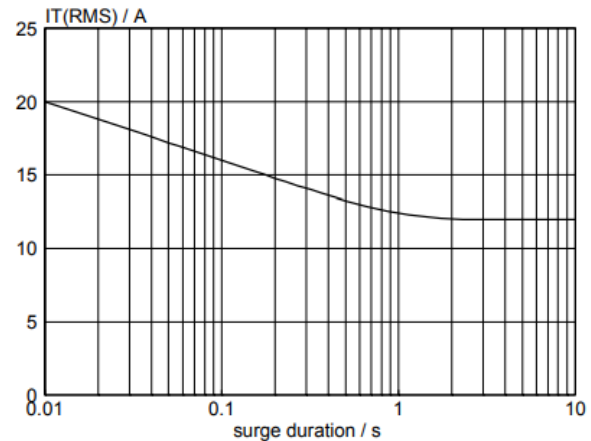


Fig.4. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, vs surge duration, for sinusoidal currents, $f = 50 \text{ Hz}$; $T_{mb} \leq 103^\circ C$.

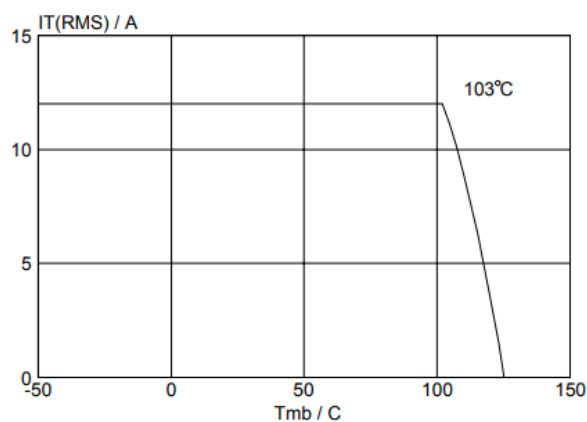


Fig.5. Maximum permissible rms current $I_{T(RMS)}$, vs mounting base temperature T_{mb} .

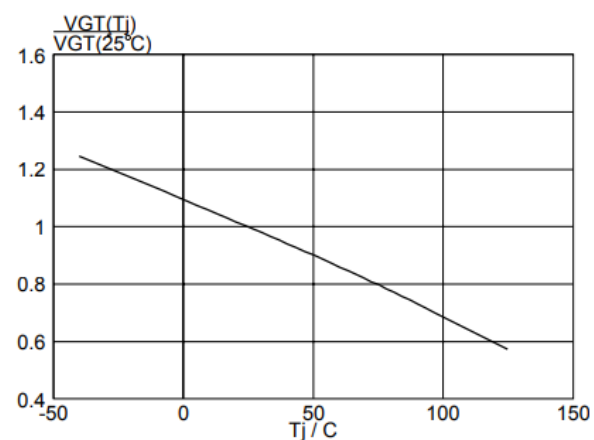


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j) / V_{GT}(25^\circ C)$, vs T_j .

Typical Characteristics

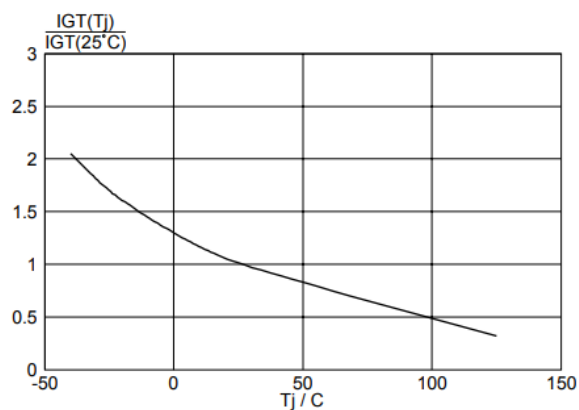


Fig.7. Normalised gate trigger current $I_{GT}(T_j) / I_{GT}(25^\circ\text{C})$, vs T_j .

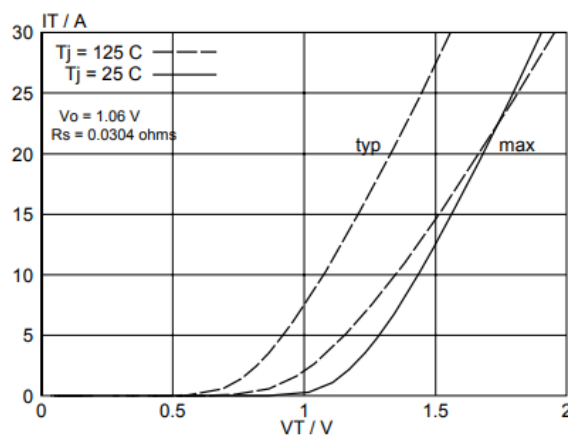


Fig.8. Typical and maximum on-state characteristic.

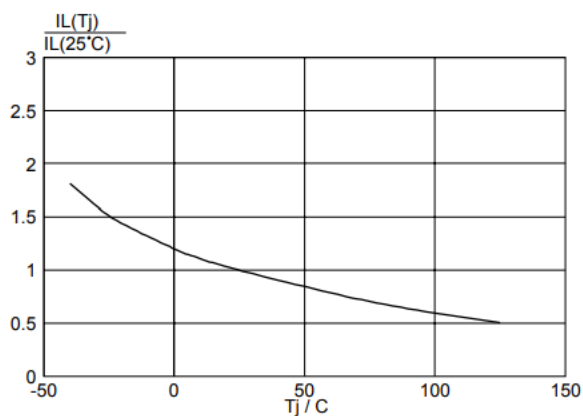


Fig.9. Normalised latching current $I_L(T_j) / I_L(25^\circ\text{C})$, vs T_j .

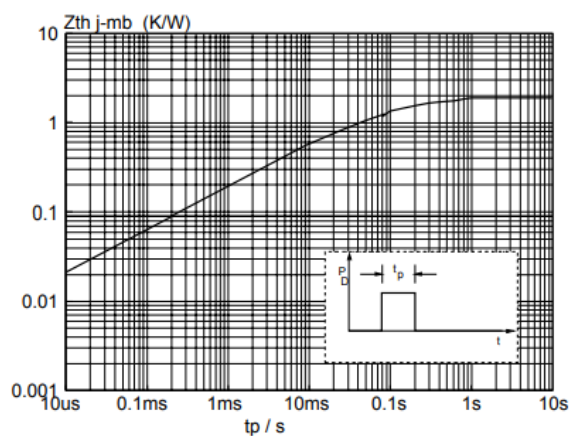


Fig.10. Transient thermal impedance $Z_{th j-mb}$, vs pulse width t_p .

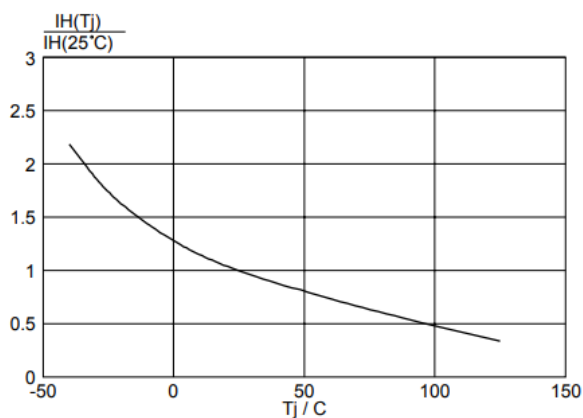


Fig.11. Normalised holding current $I_H(T_j) / I_H(25^\circ\text{C})$, vs T_j .

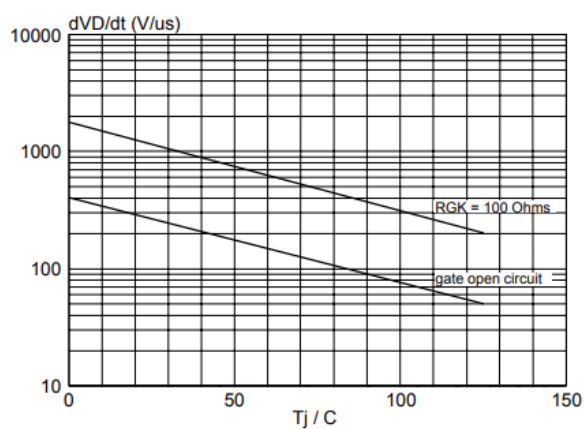


Fig.12. Typical, critical rate of rise of off-state voltage, dV_D/dt vs T_j .

Package Dimensions

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.34	4.67	0.171	0.184
A1	2.52	2.82	0.099	0.111
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.30	0.50	0.012	0.020
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
E1	12.00	12.50	0.472	0.492
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	2.60	2.80	0.102	0.110
L	13.20	13.80	0.520	0.543
L1	3.80	4.20	0.150	0.165
Φ	3.60	3.96	0.142	0.156