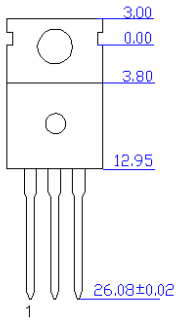
STANDARD

Glass Passivated thyristor in a plastic envelope, intended for use in application blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial, domestic lighting,heating and static switching.

TO-220AB



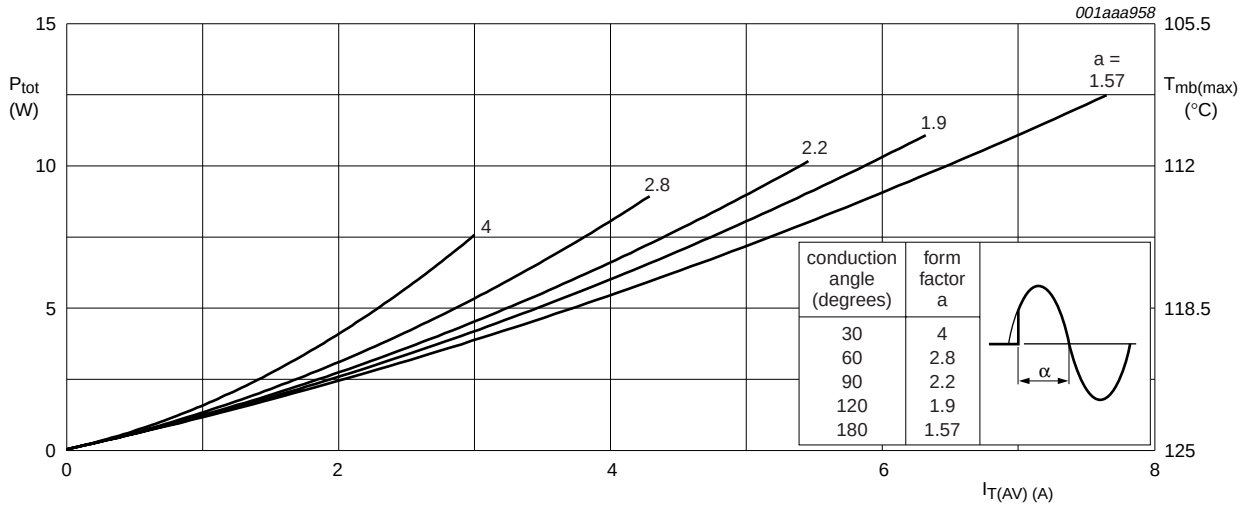
1. T1 2. T2 3. G

△ ABSOLUTE MAXIMUM RATINGS (TA=25℃)

Characteristic	Symbol	Rating	Unit
Repetitive Peak off-state voltage	V_{DRM}	650	V
RMS on-state current	$I_{T\ (RMS)}$	7.5	A
Non-repetitive peak on-state current	I_{TSM}	100	A
Peak gate power	P_{GM}	5	W
Peak gate current	I_{GM}	2	A
Junction Temperature	T_J	125	℃
Storage Temperature	T_{STG}	-40-150	℃

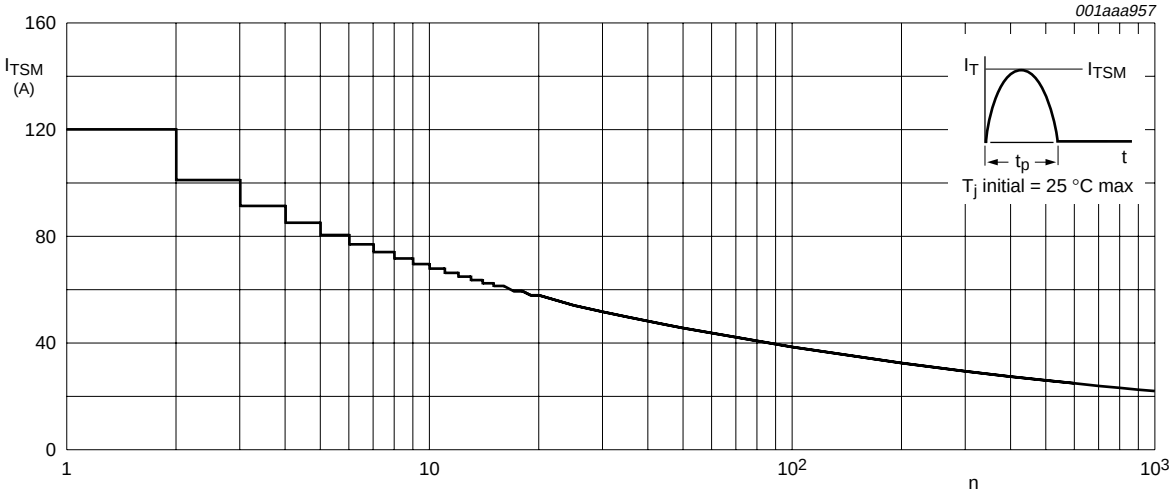
△ ELECTRICAL CHARACTERISTICS (TA=25℃)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Repetitive Peak off-state voltage	V_{DRM}		600			V
Gate trigger current	I_{GT}	V_D=12V; I_T=0.1A		2	15	mA
Base-Emitter Saturation Voltage	I_L	V_D=12V; I_{GT}=0.1A		10	40	
Holding current	I_H	V_D=12V; I_{GT}=0.1A		7.0	20	mA
Gate trigger voltage	V_{GT}	V_D= $V_{DRM(MAX)}$; I_T=0.1A; Tj=125 ℃	0.25	0.4		V
		V_D=12V; I_T=0.1A		0.6	1.5	V
Off-state leakage current	I_D, I_R	V_D=$V_{DRM(MAX)}$; V_R= $V_{RRM(MAX)}$; Tj=125 ℃		0.1	0.5	mA
On-state voltage	V_T	I_T=23A		1.4	1.75	V
Gate controlled turn-on time	T_{GT}	I_{TM}=40A;V_D=$V_{DRM(MAX)}$;I_G=0.1A; DI_G/dt=5A/us		2		us



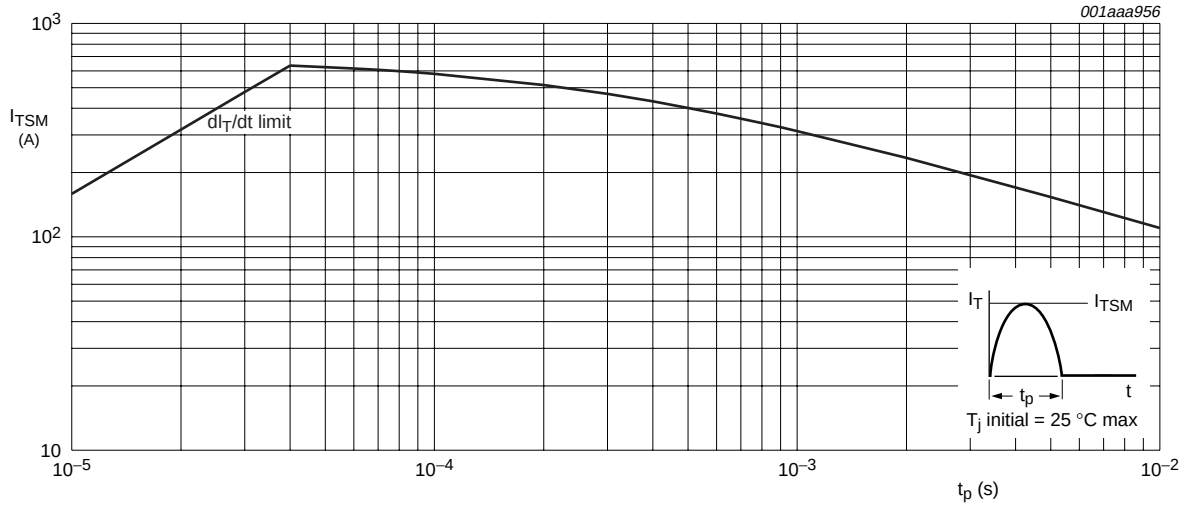
a = form factor = $I_{T(RMS)}/I_{T(AV)}$.

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



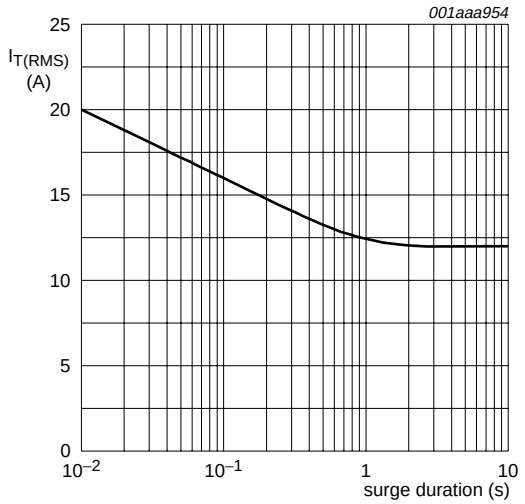
f = 50 Hz.

Fig 2. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values.



$t_p \leq 10$ ms.

Fig 3. Non-repetitive peak on-state current as a function of pulse width; maximum values.



f = 50 Hz; $T_{mb} \leq 109$ °C.

Fig 4. RMS on-state current as a function of surge duration; maximum values.

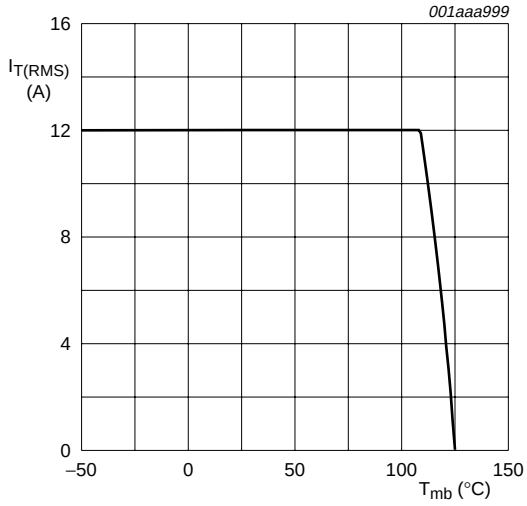


Fig 5. RMS on-state current as a function of mounting base temperature; maximum values.

Table 4: Thermal characteristics

Symbol	Parameter	Conditions	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	Figure 6	-	1.3	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	60	-	K/W

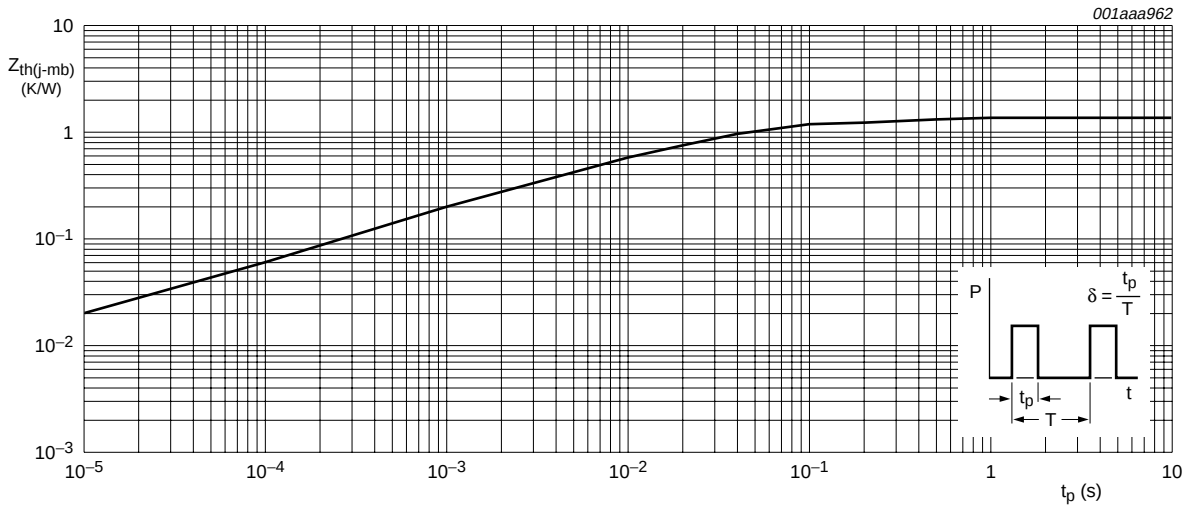


Fig 6. Transient thermal impedance as a function of pulse width.

T_j = 25 °C unless otherwise stated

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
I_{GT}	gate trigger current	V_D = 12 V; I_T = 0.1 A; Figure 8	-	2	15	mA
I_L	latching current	V_D = 12 V; I_{GT} = 0.1 A; Figure 10	-	10	40	mA
I_H	holding current	V_D = 12 V; I_{GT} = 0.1 A; Figure 11	-	7	20	mA
V_T	on-state voltage	I_T = 23 A; Figure 9	-	1.4	1.75	V
V_{GT}	gate trigger voltage	V_D = 12 V; I_T = 0.1 A; Figure 7	-	0.6	1.5	V
		V_D = $V_{DRM(max)}$; I_T = 0.1 A; T_j = 125 °C	0.25	0.4	-	V
I_D, I_R	off-state leakage current	V_D = $V_{DRM(max)}$; V_R = $V_{RRM(max)}$; T_j = 125 °C	-	0.1	0.5	mA
Dynamic characteristics						
dV_D/dt	critical rate of rise of off-state voltage	V_{DM} = 67% $V_{DRM(max)}$; T_j = 125 °C; exponential waveform; Figure 12				
		gate open circuit	50	130	-	V/ms
		R_{GK} = 100 Ω	200	1000	-	V/ms
t_{gt}	gate controlled turn-on time	I_{TM} = 40 A; V_D = $V_{DRM(max)}$; I_G = 0.1 A; dI_G/dt = 5 A/ms	-	2	-	ms
t_q	circuit commuted turn-on time	V_D = 67% $V_{DRM(max)}$; T_j = 125 °C; I_{TM} = 20 A; V_R = 25 V; dI_{TM}/dt = 30 A/ms; dV_D/dt = 50 V/ms; R_{GK} = 100 Ω	-	70	-	ms

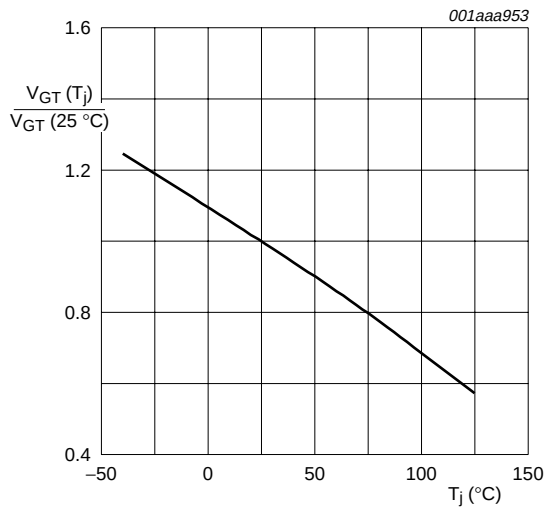


Fig 7. Normalized gate trigger voltage as a function of junction temperature.

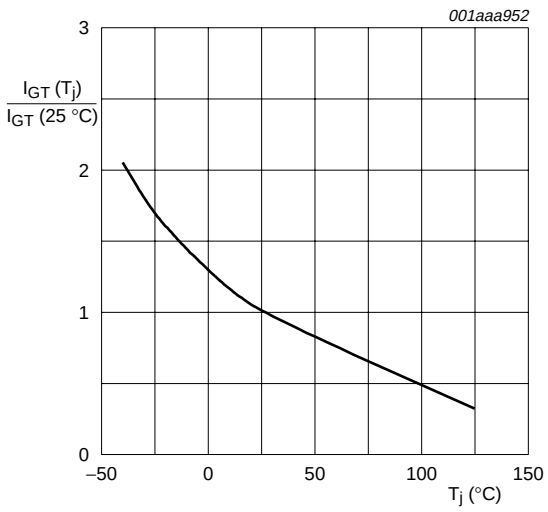
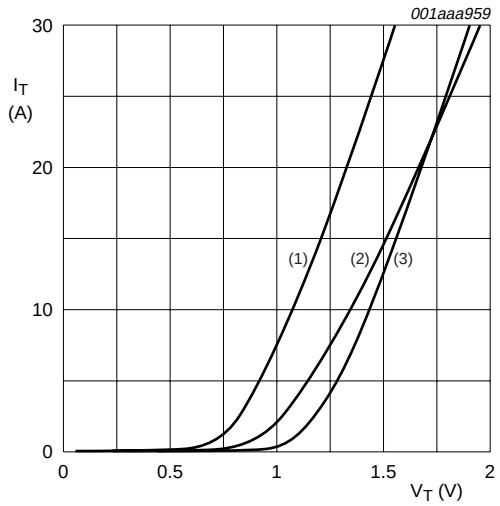


Fig 8. Normalized gate trigger current as a function of junction temperature.



V_O = 1.06 V.

R_S = 0.0304 W.

(1) T_j = 125 °C; typical values.

(2) T_j = 125 °C; maximum values.

(3) T_j = 25 °C; maximum values.

Fig 9. On-state current characteristics.

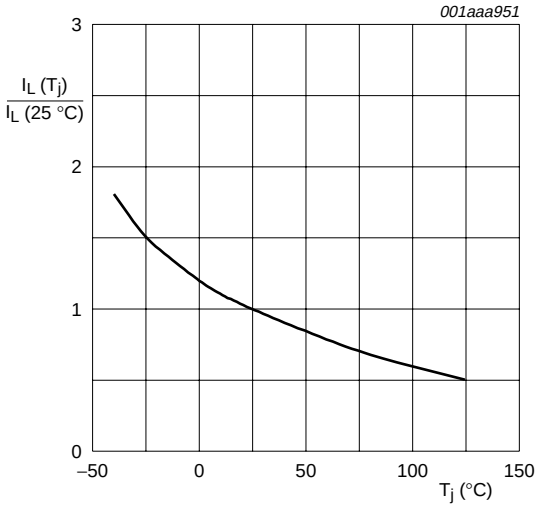


Fig 10. Normalized latching current as a function of junction temperature.

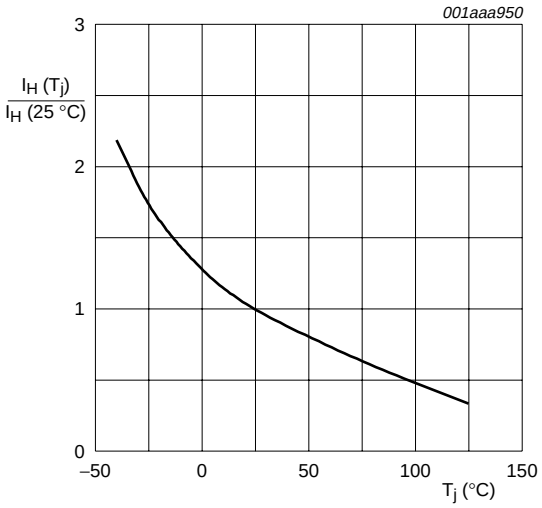
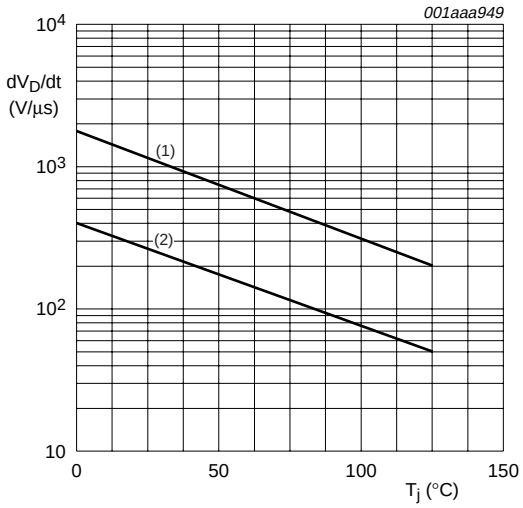


Fig 11. Normalized holding current as a function of junction temperature.



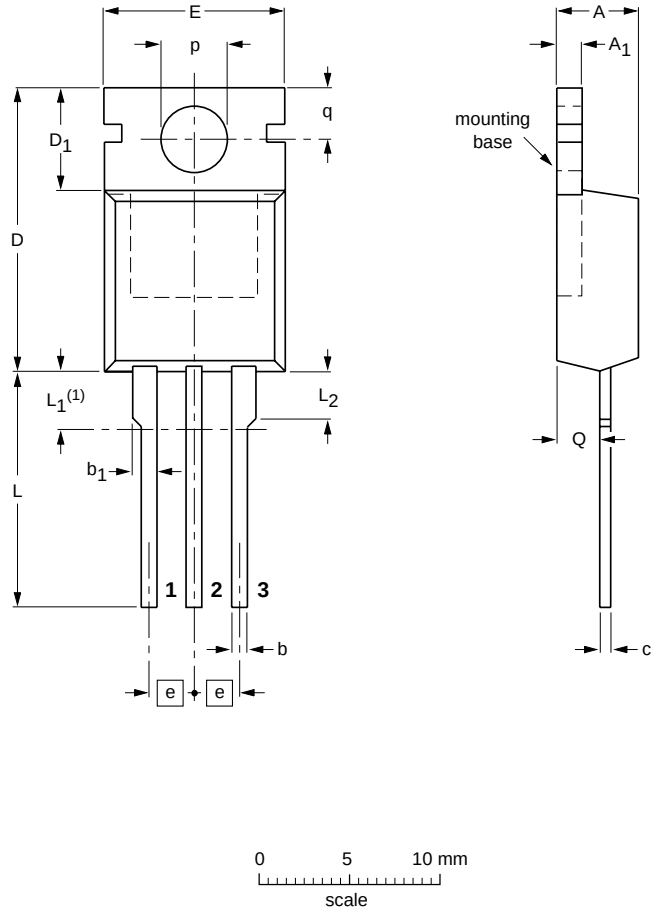
(1) R_{GK} = 100 Ω.

(2) Gate open circuit.

Fig 12. Critical rate of rise of off-state voltage as a function of junction temperature; minimum values.

PACKAGE OUTLINE

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB **SOT78**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	b_1	c	D	D_1	E	e	L	L_1(1)	L_2 max.	p	q	Q
mm	4.5 4.1	1.39 1.27	0.9 0.6	1.3 1.0	0.7 0.4	15.8 15.2	6.4 5.9	10.3 9.7	2.54	15.0 13.5	3.30 2.79	3.0	3.8 3.6	3.0 2.7	2.6 2.2

Note

1. Terminals in this zone are not tinned.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT78		3-lead TO-220AB	SC-46			~~01-02-16~~ 03-01-22