

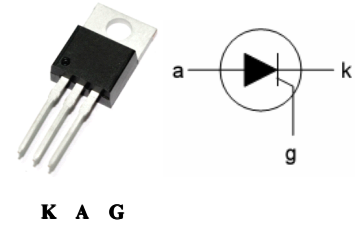
**X0405**

**Thyristors**

**DRAWING**

**General Description**

- Package: TO-220AB
- Glass passivated 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 Ratings (Limiting values)**

SYMBOL	PARAMETER		Value	UNIT	
I <sub>T(RMS)</sub>	RMS on-state current (180°C conduction angel)		T <sub>I</sub> =60°C	4	A
			T <sub>amb</sub> =25°C	1.35	
I <sub>T(AV)</sub>	Average on-state current(180°C conduction angel)		T <sub>I</sub> =60°C	2.5	A
			T <sub>amb</sub> =25°C	0.9	
I <sub>TSM</sub>	Non repetitive surge peak on-state current	tp=8.3ms	T <sub>j</sub> =25°C	33	A
		tp=10ms		30	
I <sub>t</sub>	I <sub>t</sub> Value for fusing	tp=10ms	T <sub>j</sub> =25°C	4.5	A <sup>2</sup> S
Di/Dt	Critical rate of rise of on-state current I <sub>g</sub> =2X I <sub>GT, TR</sub> ≤100ns	F=60HZ	T <sub>j</sub> =125°C	50	A/us
I <sub>GM</sub>	Peak gate current	tp=20us	T <sub>j</sub> =125°C	1.2	A
P <sub>g(AV)</sub>	Average gate power dissipation		T <sub>j</sub> =125°C	0.2	W
T <sub>stg</sub>	Storage junction temperature range			-40to+150	°C
T <sub>j</sub>	Operating junction temperature range			-40to+125	

**Electrical Characteristics (T<sub>j</sub>=25°C, unless otherwise specified)**

SYMBOL	Test Conditions		Spec		Unit	
I <sub>GT</sub>	V <sub>D</sub> =6V RL=140Ω		MIN	10	uA	
			MAX	120	uA	
V <sub>GT</sub>			MAX	1.0	V	
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> RL=3.3KΩ RGK=1KΩ	T <sub>J</sub> =125°C	MIN	0.1	V	
V <sub>RG</sub>	I <sub>RG</sub> =10uA		MIN	8	V	
I <sub>h</sub>	I <sub>t</sub> =100mA RGK=1KΩ		MAX	1	mA	
I <sub>L</sub>	I <sub>G</sub> =1mA RGK=1KΩ		MIN	6	mA	
DV/DT	V <sub>D</sub> =67%V <sub>DRM</sub> RGK=1KΩ	T <sub>J</sub> =110°C	MIN	15	V/us	
V <sub>TM</sub>	I <sub>TM</sub> =5A tp=400us	T <sub>J</sub> =25°C	MAX	1.45	V	
V <sub>to</sub>	Threshold voltage		MAX	0.95	V	
R <sub>d</sub>	Dynamic resistance		MAX	100	mΩ	
I <sub>DRM</sub>	V <sub>DRM</sub> =V <sub>RRM</sub> RGK=1KΩ		T <sub>J</sub> =25°C	MAX	10	uA
I <sub>R</sub> RM			T <sub>J</sub> =125°C	MAX	-10	uA

**Thermal Resistances**

SYMBOL	PARAMETER	Value	Unit
Rth(j-l)	Junction to leads(DC)	15	°C/W
Rth(j-a)	Junction to ambient(DC)	100	

**Typical Characteristics**

Fig. 1: Maximum average power dissipation versus average on-state current.

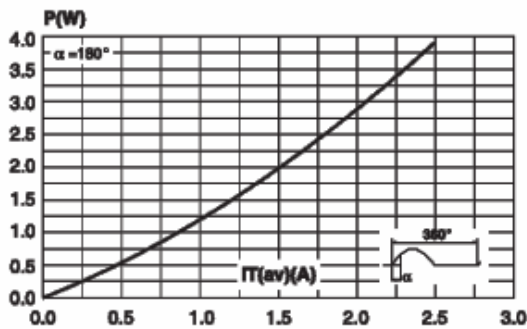


Fig. 2-1: Average and D.C. on-state current versus lead temperature.

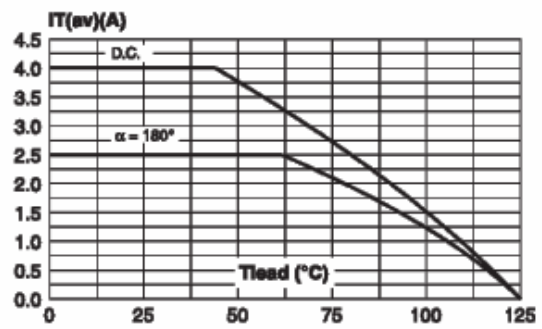


Fig. 2-2: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout).

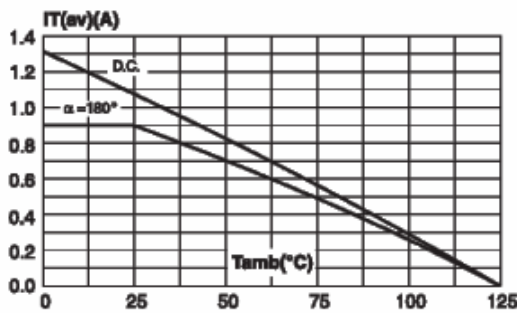


Fig. 3: Relative variation of thermal impedance junction to ambient versus pulse duration.

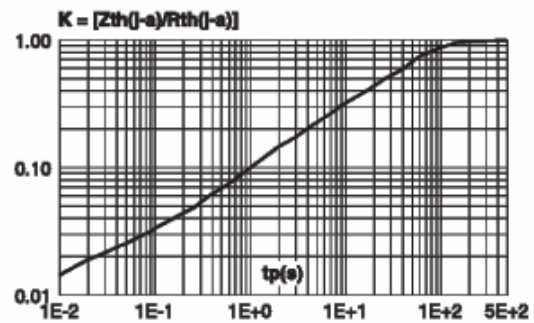


Fig. 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

Fig. 5: Relative variation of holding current versus gate-cathode resistance (typical values).

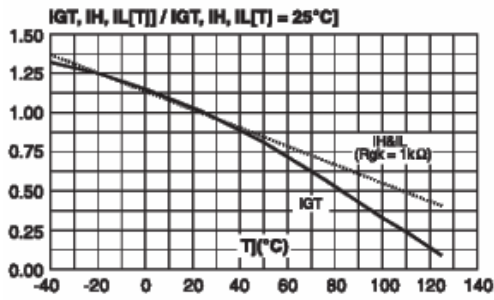


Fig. 6: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values).

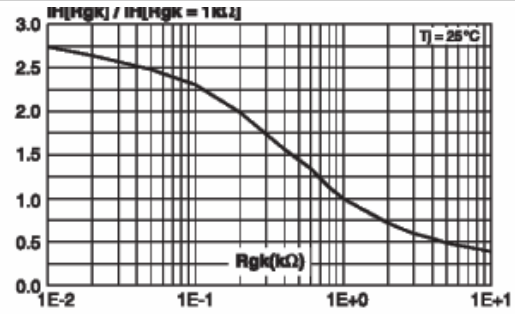


Fig. 7: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values).

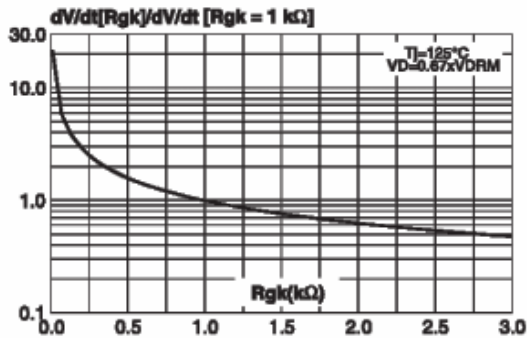


Fig. 8: Surge peak on-state current versus number of cycles.

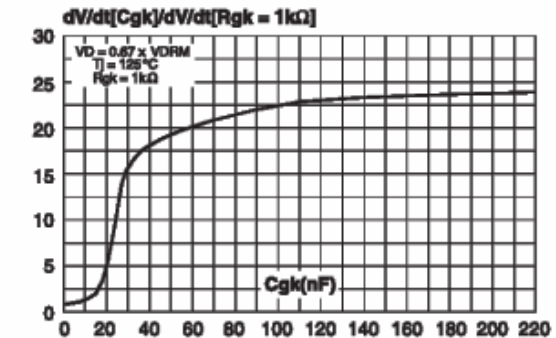


Fig. 9: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms, and corresponding value of  $I t$ .

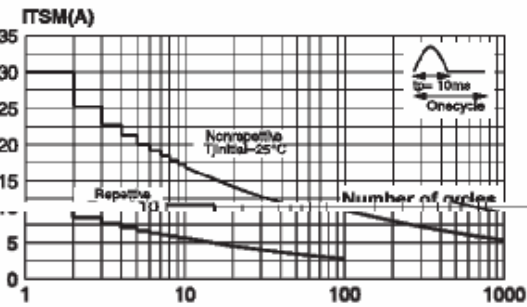
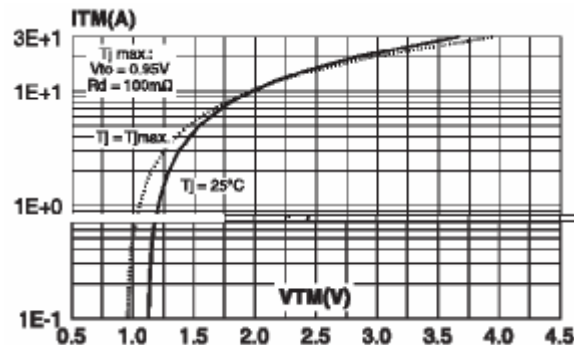
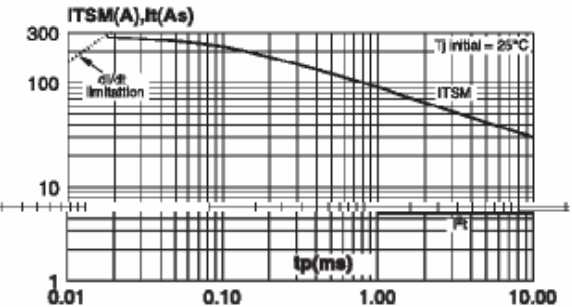


Fig. 10: On-state characteristics (maximum values).



Mechanical Dimensions

