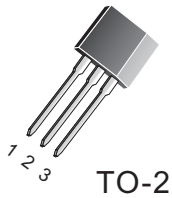
X0405MF

SCRs

HAOPIN MICROELECTRONICS CO.,LTD.

Description

Glass passivated, sensitive gate thyristors in a plastic envelope, intended for use in general purpose switching and phase control applications. These devices are intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

Symbol	Simplified outline
	 TO-202-3

Pin	Description
1	Cathode
2	Anode
3	Gate

Applications:

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

Features

- Blocking voltage to 600 V
- On-state RMS current to 4 A
- Ultra low gate trigger current

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages	600	V
$I_{T\ (RMS)}$	RMS on-state current	4	A
I_{TSM}	Non-repetitive surge peak on-state current	30	A

SYMBOL	PARAMETER	Value	UNIT
Rth(j-l)	Junction to case(DC)	15	℃/W
Rth(j-a)	Junction to ambient	100	℃/W

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

SYMBOL	PARAMETER	CONDITIONS			MIN	Value	UNIT
V_{DRM}/V_{RRM}					-	600/800	V
$I_{T(RMS)}$	RMS on-state current	180°conduction angle			-	4	A
I_{TSM}	Non repetitive surge peak on-statecurrent		tp=8.3ms	Tj=25℃	-	33	A
			tp=10ms	Tj=25℃	-	30	A
I^2t	I^2t Value for fusing	T_p=10ms		Tj=25℃	-	4.5	A^2S
DI/dt	Critical rate of rise of on-state current	IG=2x I_{GT},tr<=100ns	F=60H_z	Tj=125℃	-	50	A/μs
I_{GM}	Peak gate current		tp=20us	Tj=125℃	-	1.2	A
I_{DRM}	V_{DRM}=V_{RRM}	R_{GK}=1KΩ		Tj=25℃	-	5	μA
I_{RRM}	V_{DRM}=V_{RRM}	R_{GK}=1KΩ		Tj=125℃	-	1	mA
$P_{G(AV)}$	Average gate power			Tj=125℃	-	0.2	W
T_{stg}	Storage temperature range				-40	150	℃
T_j	Operating junction Temperature range				-40	125	℃

T_J=25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I_{GT} V_{GT}		V_D=12V; RL=140Ω	20 -	-	50 0.8	uA V
I_L		I_G=1mA R_{GK}=1KΩ	6	-	-	mA
I_H		I_T=50mA R_{GK}=1K	-	-	5	mA
V_{GD}		V_D=V_{DRM} R_L=3.3KΩ Tj=125℃	0.1	-	-	V
dV/dt		V_D=67%V_{DRM} R_{GK}=1KΩ Tj=110℃	15	-	-	V/us
R_d	Dynamic resistance	T_J=125℃	-	-	100	mΩ

Dynamic Characteristics

V_{TM}	I_{TM}=8A tp=380us	T_J=25℃	-	-	1.8	V
V_{to}	Threshold voltage	T_J=125℃	-	-	0.95	V

Description

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

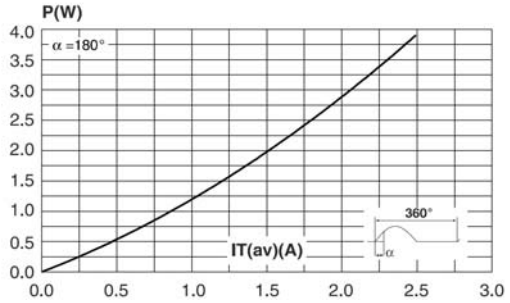


Fig. 2-1: Average and D.C. on-state current versus lead temperature.

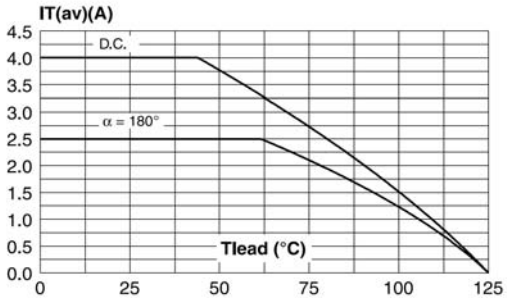


Fig. 2-2: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout).

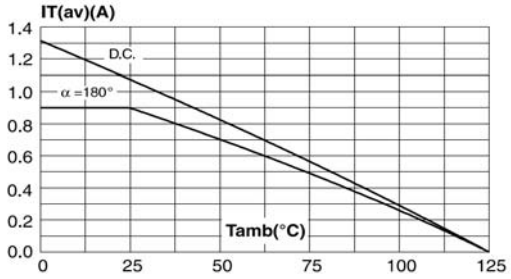


Fig. 3: Relative variation of thermal impedance junction to ambient versus pulse duration.

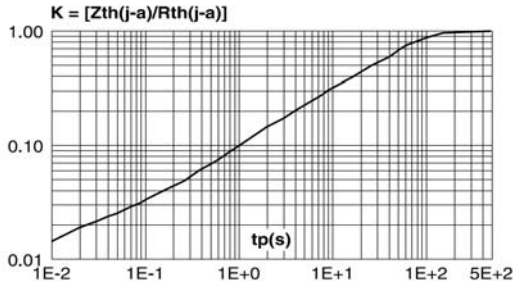


Fig. 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

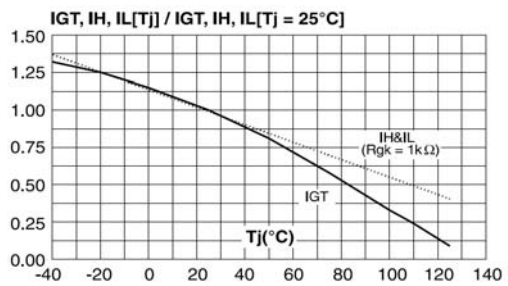
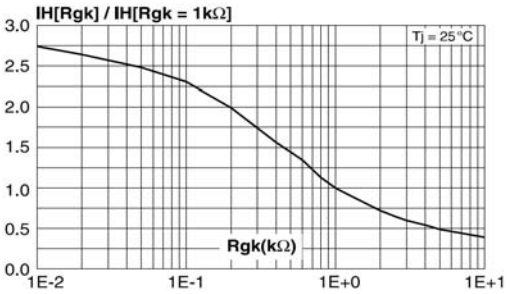


Fig. 5: Relative variation of holding current versus gate-cathode resistance (typical values).



Description

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

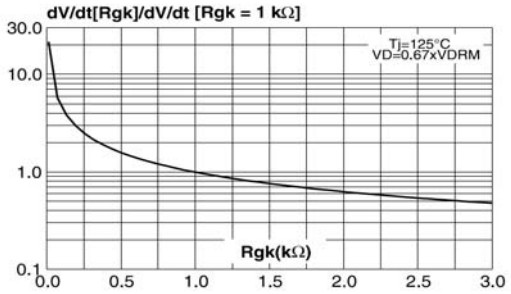


Fig. 7: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values).

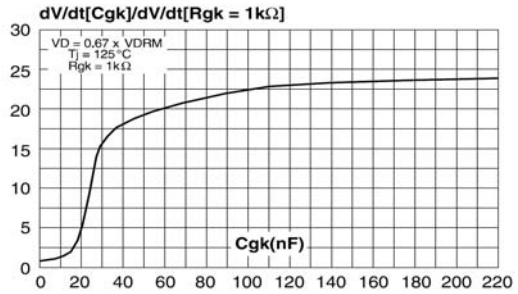


Fig. 8: Surge peak on-state current versus number of cycles.

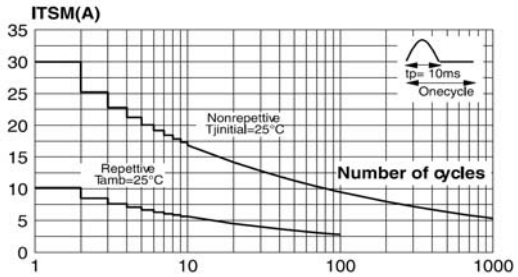


Fig. 9: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10 ms, and corresponding value of I^2t.

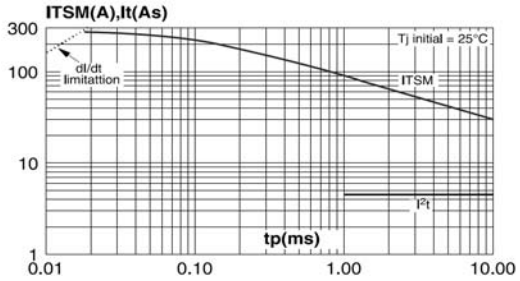
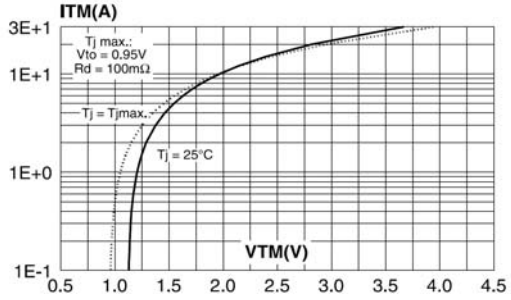
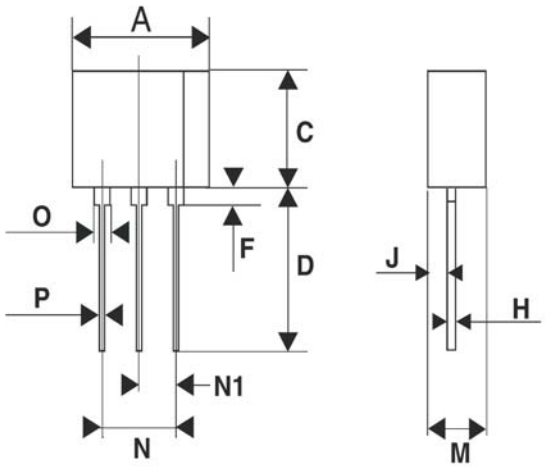


Fig. 10: On-state characteristics (maximum values).



MECHANICAL DATA

Dimensions in mm
Net Mass: 0.8 g



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			10.1			0.398
C		7.3			0.287	
D		10.5			0.413	
F			1.5			0.059
H		0.51			0.020	
J		1.5			0.059	
M		4.5			0.177	
N			5.3			0.209
N1		2.54			0.100	
O			1.4			0.055
P			0.7			0.028