
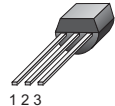


HAOPIN MICROELECTRONICS CO.,LTD.

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-92	
Pin	Description		
1	Cathode		
2	anode		
3	gate		
TAB	anode		

Applications:

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

Features

- ◆ Blocking voltage to 400 V
- ◆ On-state RMS current to 0.8 A
- ◆ Ultra low gate trigger current

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages	400	V
$I_T (RMS)$	RMS on-state current (full sine wave)	0.8	A
I_{TSM}	Non-repetitive peak on-state current (full cycle, T_j initial=25°C)	8	A

SYMBOL	PARAMETER	Value	UNIT
$R_{th(j-a)}$	Junction to ambient (DC)	150	°C/W
$R_{th(j-l)}$	Junction to lead (DC)	80	°C/W

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

SYMBOL	PARAMETER	CONDITIONS		Value	UNIT	
V_{DRM}	Repetitive peak off-state Voltages		-	400	V	
I_{TSM}	Non repetitive surge peak on-state current	$T_I=25^{\circ}C$	$T_p=8.3ms$	-	8	A
			$T_p=10ms$	-	7	
$I_{T(AV)}$	Average On-state Current	Half Cycle= 180° $T_I=55^{\circ}C$	-	0.5	A	
$I_{T(RMS)}$	RMS on-state current	$T_I=55^{\circ}C$	-	0.8	A	
I_{GM}	Peak gate current	$T_p=20\mu s$ $T_j=125^{\circ}C$	-	1	A	
di/dt	Critical rate of rise of on-state current	$I_G=2 \cdot I_{GT}$, $tr \leq 100ns$ $F=60Hz$	$T_j=125^{\circ}C$	-	30	A/ μs
$P_{G(AV)}$	Average gate power		$T_j=125^{\circ}C$	-	0.1	W
I^2t	I^2t Value for fusing	$T_p=10ms$	$T_j=25^{\circ}C$	-	0.24	A ² s
T_{stg} T_j	Average gate power dissipation Operating junction temperature range			-	-40 to+150 -40 to+125	$^{\circ}C$

$T_j=25^{\circ}C$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT	
Static characteristics							
I_{GT} V_{GT}	Gate trigger current	$V_D=12V$ $R_L=140\Omega$	-	-	200 0.8	μA V	
V_{TM} V_{GD}	Forward On- voltage	$I_{TM}=1.6A$ $t_p=380\mu s$	$T_j=25^{\circ}C$	-	-	1.95	V
		$V_D=V_{DRM}$ $R_L=3.3k\Omega$ $R_{GK}=1K\Omega$	$T_j=125^{\circ}C$	0.1	-	-	V
I_H I_L	Holding Current	$I_T=50mA$ $R_{GK}=1K\Omega$		-	-	5	mA
		$I_G=1mA$ $R_{GK}=1K\Omega$		-	-	6	mA
I_{DRM}		V_{DRM} $R_{GK}=1k\Omega$	$T_j=125^{\circ}C$ $T_j=25^{\circ}C$	- -	- -	100 1	μA
V_{TO}	Threshold voltage					1.0	V

Dynamic Characteristics

Dv/dt	Critical rate of rise of voltage rise	$V_D=67\% V_{DRM}$ $R_{GK}=1K\Omega$ $T_j=125^{\circ}C$	75	-	-	V/ μs
t_{gd}	Gate controlled delay time	$I_G=10mA$, $di/dt=0.1A/us$	-	-	-	μs
t_g	commutated turn-off time	$V_D=0.67V_{DRM}$, $T_j=85^{\circ}C$; $I_T=I_{T(AV)}$, $V_R=35V$;	-	-	-	μs

Description

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

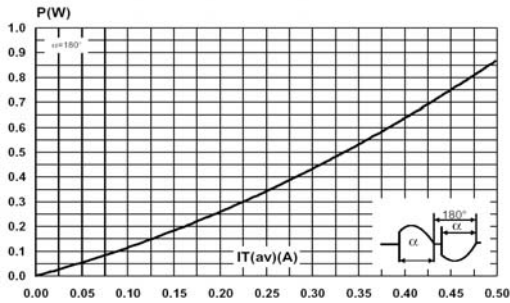


Fig. 2-1: Average and D.C. on-state current versus lead temperature.

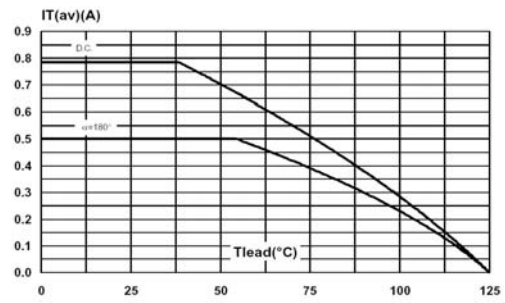


Fig. 2-2: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout).

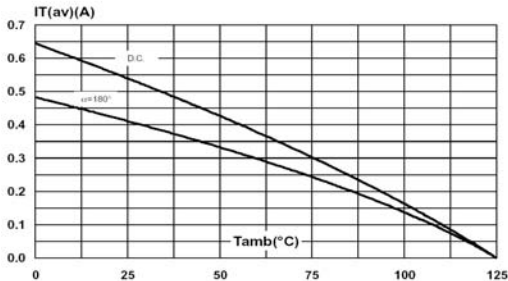


Fig. 3: Relative variation of thermal impedance junction to ambient versus pulse duration.

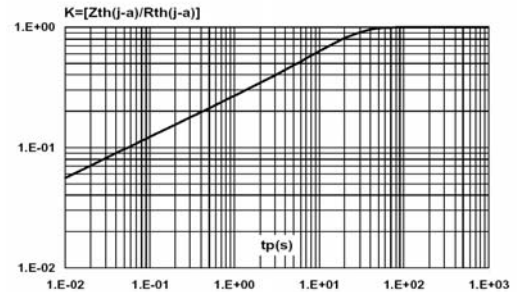


Fig. 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

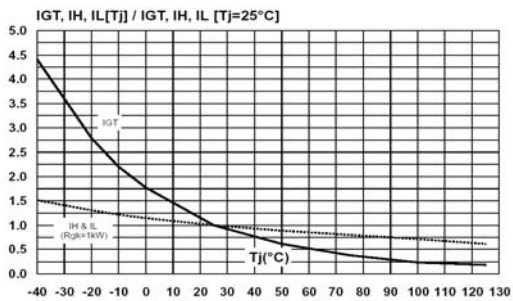
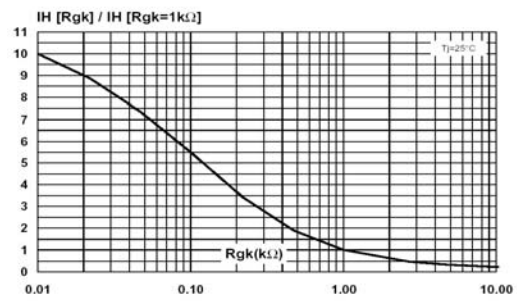


Fig. 5: Relative variation of holding current versus gate-cathode resistance (typical values).



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

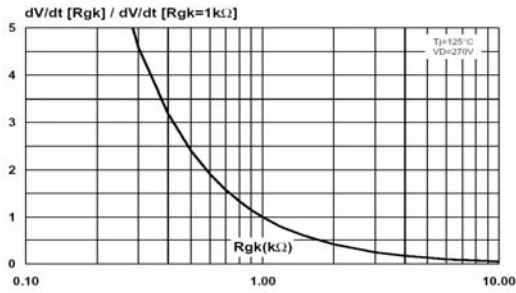


Fig. 7: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values).

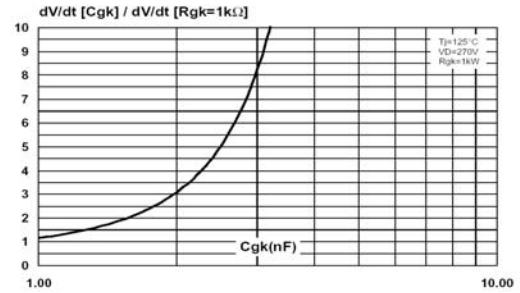


Fig. 8: Surge peak on-state current versus number of cycles.

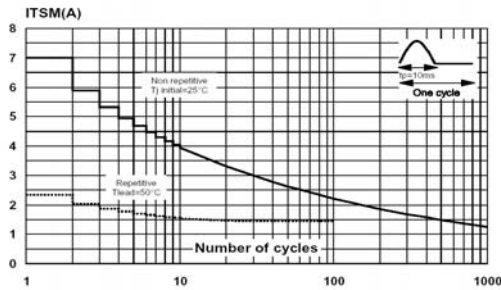


Fig. 9: Non repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10ms$, and corresponding value of I^2t .

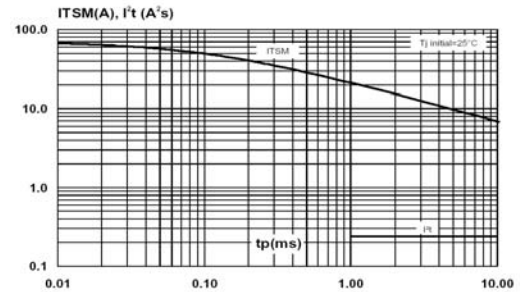
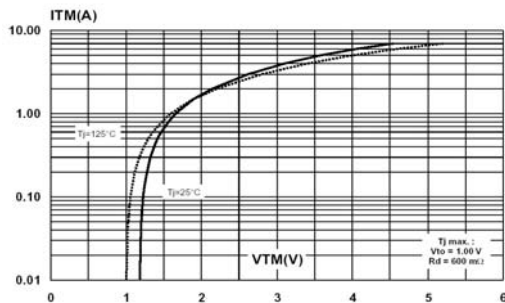


Fig. 10: On-state characteristics (maximum values).

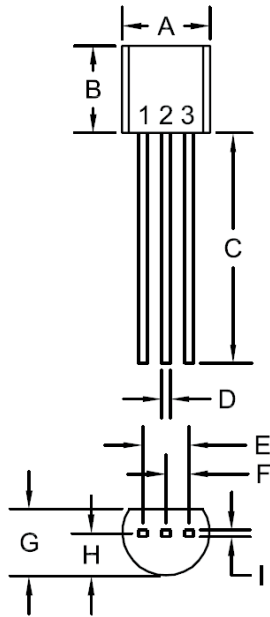


MECHANICAL DATA

Dimensions in mm

Net Mass:0.2 g

TO-92



SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.175	0.205	4.45	5.21
B	0.170	0.210	4.32	5.33
C	0.500	-	12.70	-
D	0.016	0.022	0.41	0.56
E	0.100		2.54	
F	0.050		1.27	
G	0.125	0.165	3.18	4.19
H	0.080	0.105	2.03	2.67
I	0.015		0.38	

TO-92 (REV: R1)

R1