



# X04xxxF

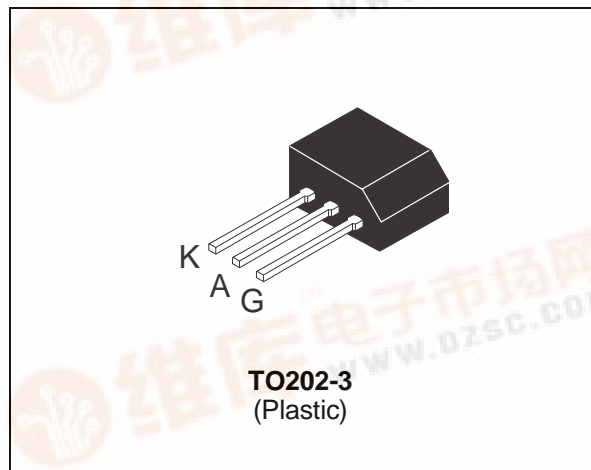
## SENSITIVE GATE SCR

### FEATURES

- $I_{T(RMS)} = 4A$
- $V_{DRM} = 400V$  to  $800V$
- Low  $I_{GT} < 200\mu A$

### DESCRIPTION

The X04xxxF series of SCRs uses a high performance TOP GLASS PNP technology. These parts are intended for general purpose applications where low gate sensitivity is required, like small engine ignition, SMPS crowbar protection, food processor.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)	$T_c = 90^\circ C$	4	A
		$T_a = 25^\circ C$	1.35	
$I_{T(AV)}$	Mean on-state current (180° conduction angle)	$T_c = 90^\circ C$	2.5	A
		$T_a = 25^\circ C$	0.9	
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = $25^\circ C$ )	$t_p = 8.3$ ms	33	A
		$t_p = 10$ ms	30	
$I^2t$	$I^2t$ Value for fusing	$t_p = 10$ ms	4.5	$A^2s$
$di/dt$	Critical rate of rise of on-state current $I_G = 10$ mA $di_G/dt = 0.1$ A/ $\mu s$ .		50	A/ $\mu s$
$T_{stg}$ $T_j$	Storage and operating junction temperature range		- 40, + 150 - 40, + 125	$^\circ C$
TI	Maximum lead temperature for soldering during 10s at 4.5mm from case		260	$^\circ C$

Symbol	Parameter	Voltage			Unit
		D	M	N	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125^\circ C$ $R_{GK} = 1K\Omega$	400	600	800	V

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### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
Rth(j-a)	Junction to ambient	100	°C/W
Rth(j-c)	Junction to case for DC	7.5	°C/W

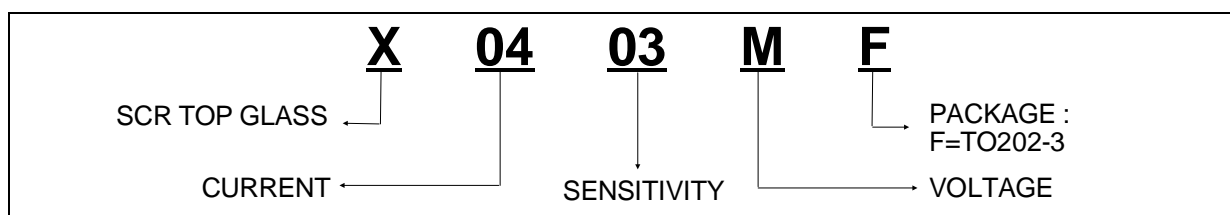
### GATE CHARACTERISTICS

$P_{G(AV)} = 0.2 \text{ W max.}$      $P_{GM} = 3 \text{ W max. (tp = 20 } \mu\text{s)}$      $I_{GM} = 1.2 \text{ A max. (tp = 20 } \mu\text{s)}$   
 $V_{GD} = 0.1 \text{ Vmin. (V}_D = V_{DRM} \text{ R}_L = 3.3 \text{ k}\Omega \text{ R}_{GK} = 1 \text{ K}\Omega \text{ T}_j = 125^\circ\text{C)}$

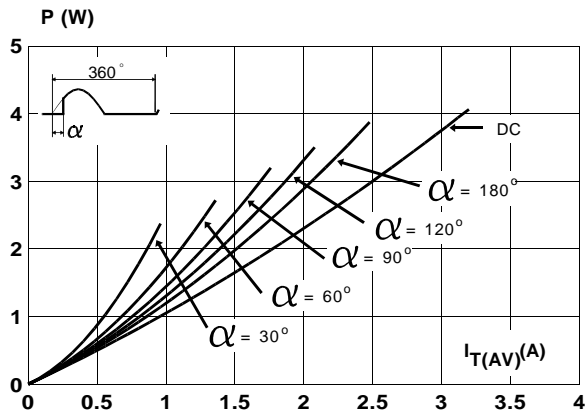
### ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions			Sensitivity			Unit
				02	03	05	
I <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =140Ω	T <sub>j</sub> = 25°C	MIN		20	20	μA
			MAX	200	200	50	
V <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =140Ω	T <sub>j</sub> = 25°C	MAX	0.8			V
V <sub>RGM</sub>	I <sub>RG</sub> =10μA	T <sub>j</sub> = 25°C	MIN	8			V
I <sub>H</sub>	I <sub>T</sub> = 50mA R <sub>GK</sub> = 1 KΩ	T <sub>j</sub> = 25°C	MAX	5			mA
I <sub>L</sub>	I <sub>G</sub> =1mA R <sub>GK</sub> = 1 KΩ	T <sub>j</sub> = 25°C	MAX	6			mA
V <sub>TM</sub>	I <sub>TM</sub> = 8A tp= 380μs	T <sub>j</sub> = 25°C	MAX	1.8			V
I <sub>DRM</sub> I <sub>RRM</sub>	V <sub>D</sub> = V <sub>DRM</sub> R <sub>GK</sub> = 1 KΩ V <sub>R</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C	MAX	5			μA
		T <sub>j</sub> = 110°C	MAX	200			
dV/dt	V <sub>D</sub> =67%V <sub>DRM</sub> R <sub>GK</sub> = 1 KΩ	T <sub>j</sub> = 110°C	MIN	10	15	15	V/μs

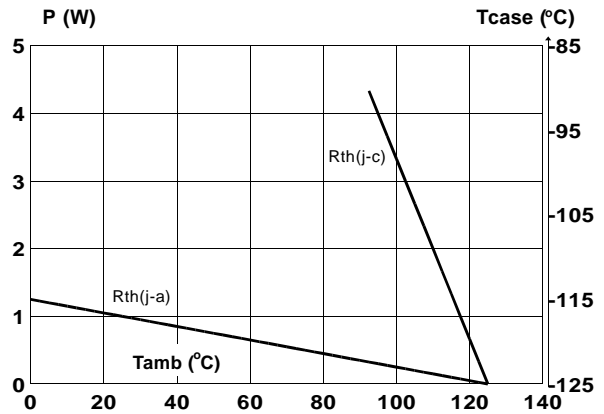
### ORDERING INFORMATION



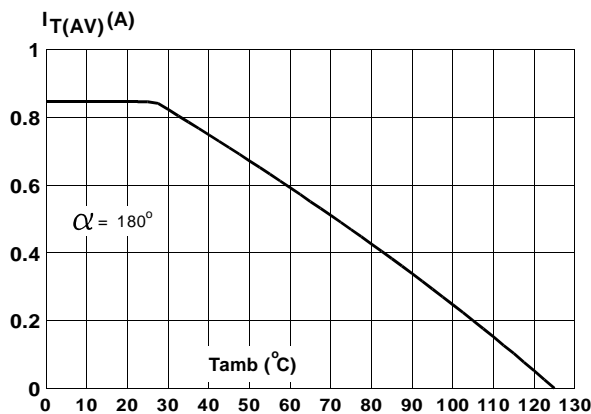
**Fig.1** : Maximum average power dissipation versus average on-state current.



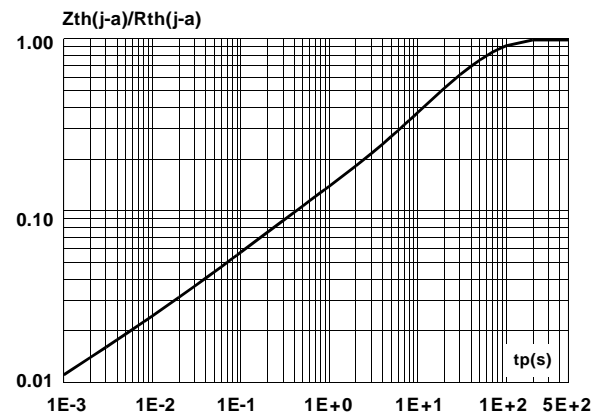
**Fig.2** : Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tcase).



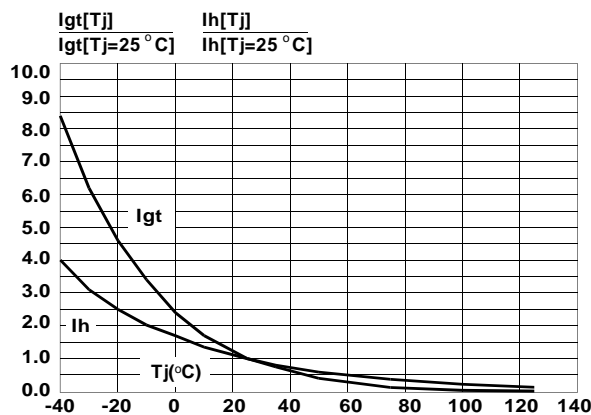
**Fig.3** : Average on-state current versus case temperature.



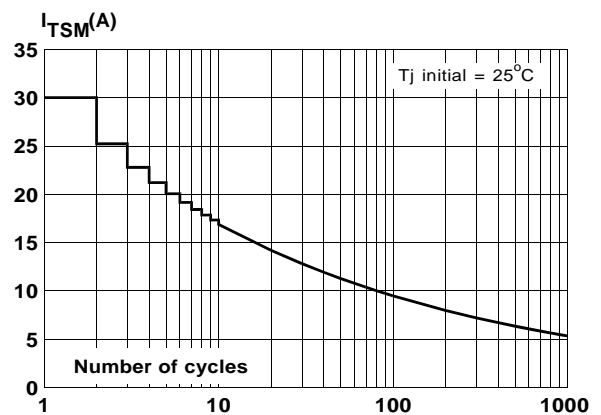
**Fig.4** : Relative variation of thermal impedance junction to ambient versus pulse duration.



**Fig.5** : Relative variation of gate trigger current and holding current versus junction temperature.

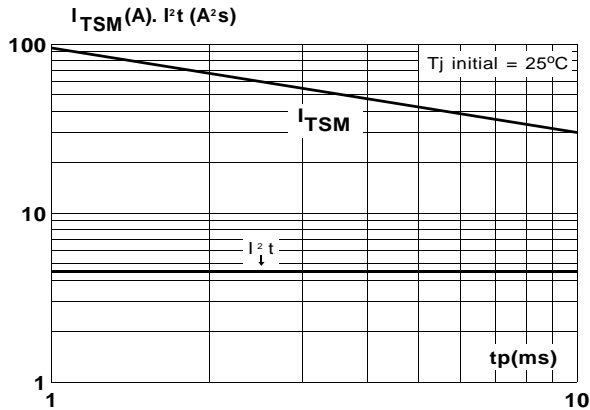


**Fig.6** : Non repetitive surge peak on-state current versus number of cycles.

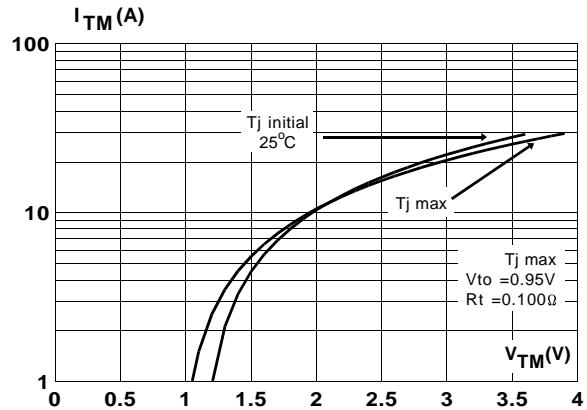


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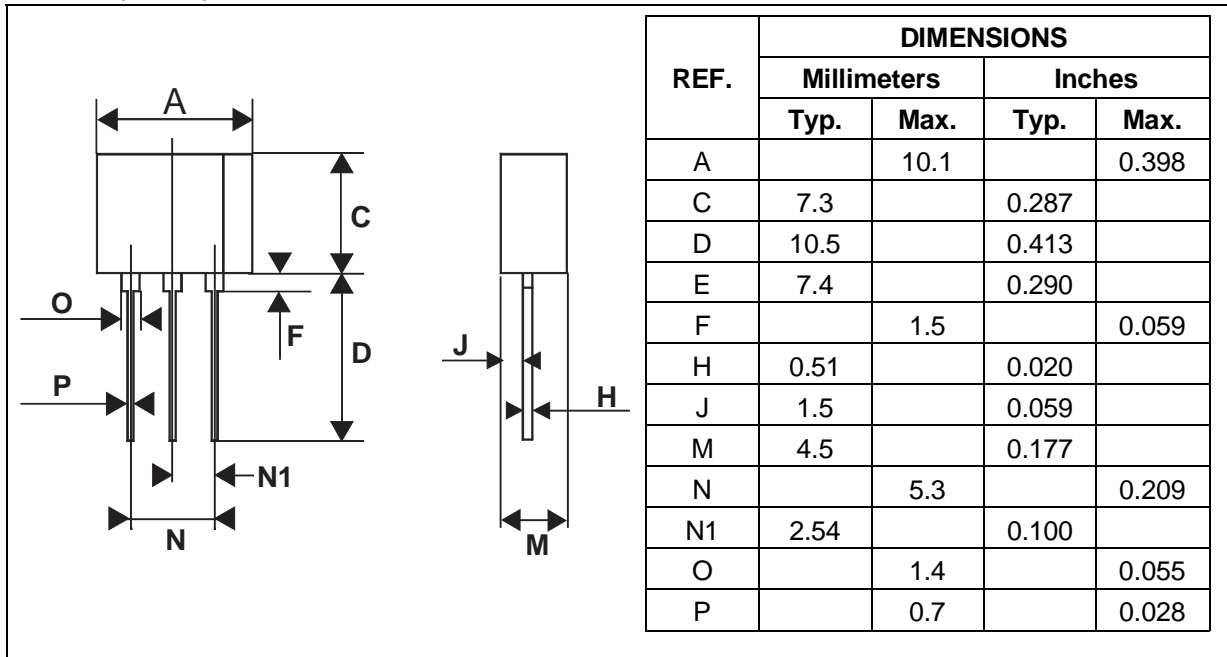
**Fig.7** : Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



**Fig.8** : On-state characteristics (maximum values).



## PACKAGE MECHANICAL DATA TO202-3 (Plastic)



Marking : type number  
Weight : 1 g

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