



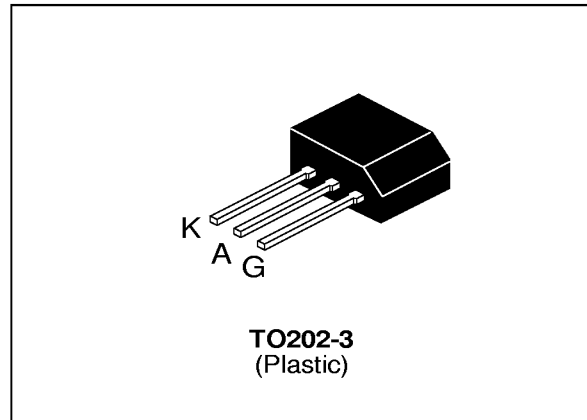
**SENSITIVE GATE SCR**

**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)	Tc= 90°C	4	A
		Ta= 25°C	1.35	
$I_{T(AV)}$	Mean on-state current (180° conduction angle)	Tc= 90°C	2.5	A
		Ta= 25°C	0.9	
$I_{TSM}$	Non repetitive surge peak on-state current (T <sub>j</sub> initial = 25°C)	tp = 8.3 ms	33	A
		tp = 10 ms	30	
$I^2t$	I <sup>2</sup> t Value for fusing	tp = 10 ms	4.5	A <sup>2</sup> s
dI/dt	Critical rate of rise of on-state current I <sub>G</sub> = 10 mA    di <sub>G</sub> /dt = 0.1 A/μs.		50	A/μs
T <sub>stg</sub> T <sub>j</sub>	Storage and operating junction temperature range		- 40, + 150 - 40, + 125	°C
TI	Maximum lead temperature for soldering during 10s at 4.5mm from case		260	°C

Symbol	Parameter	Voltage			Unit
		D	M	N	
V <sub>DRM</sub> V <sub>RRM</sub>	Repetitive peak off-state voltage T <sub>j</sub> = 125°C R <sub>GK</sub> = 1KΩ	400	600	800	V

## X04xxxF

### 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

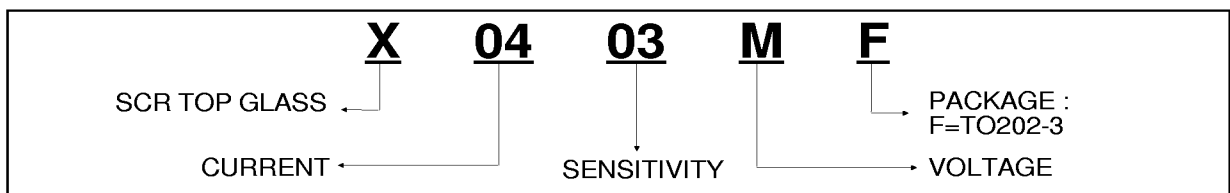
### GATE CHARACTERISTICS

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

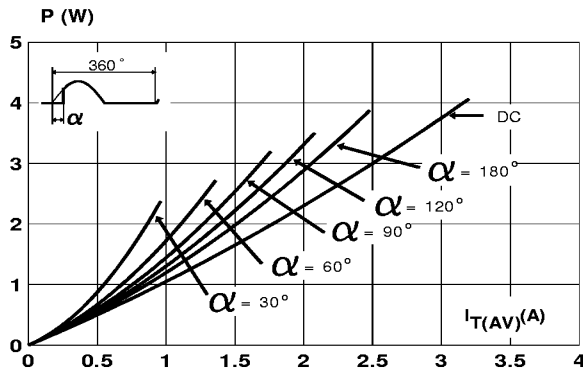
### ELECTRICAL CHARACTERISTICS

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

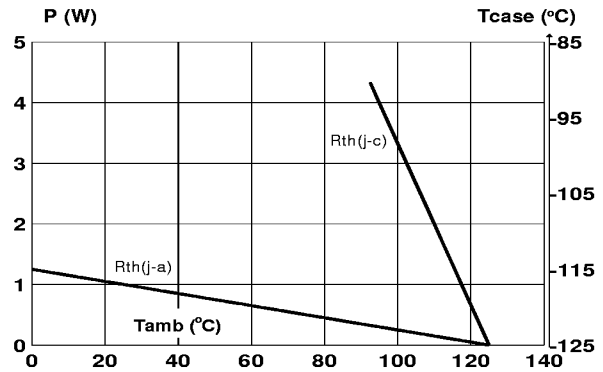
### ORDERING INFORMATION



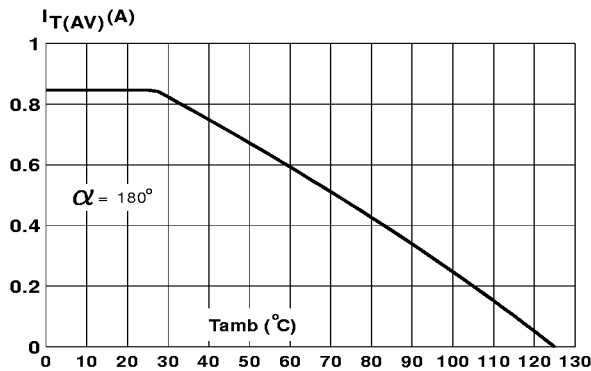
**Fig.1** : Maximum average power dissipation versus average on-state current.



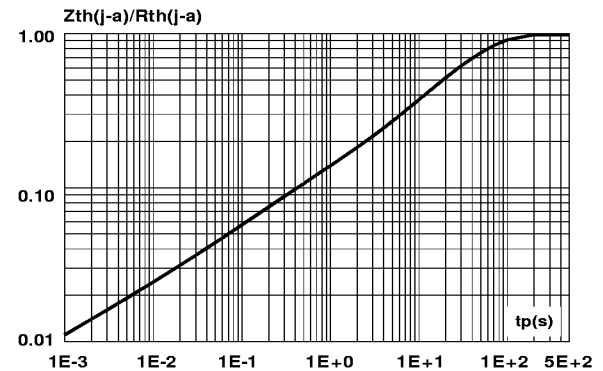
**Fig.2** : Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tcase).



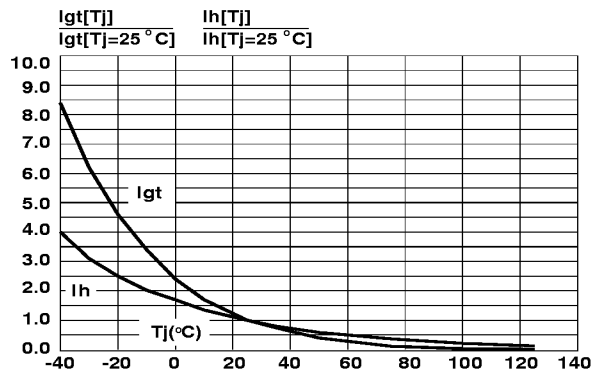
**Fig.3** : Average on-state current versus case temperature.



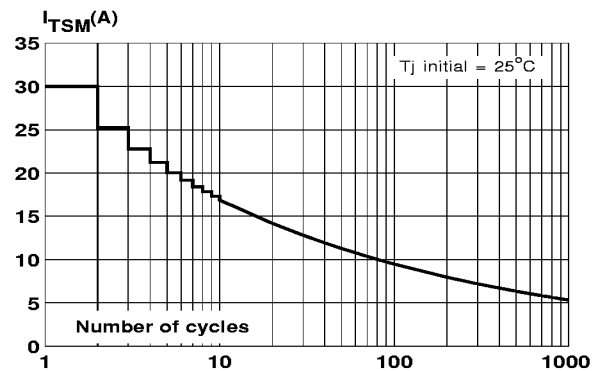
**Fig.4** : Relative variation of thermal impedance junction to ambient versus pulse duration.



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

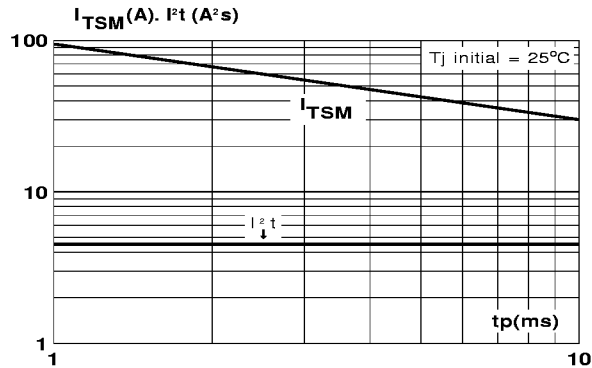


**Fig.6** : Non repetitive surge peak on-state current versus number of cycles.

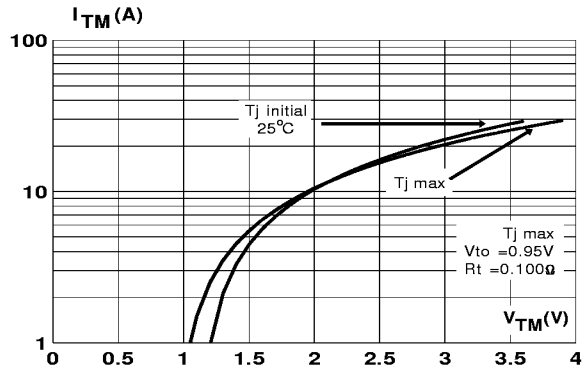


**X04xxxF**

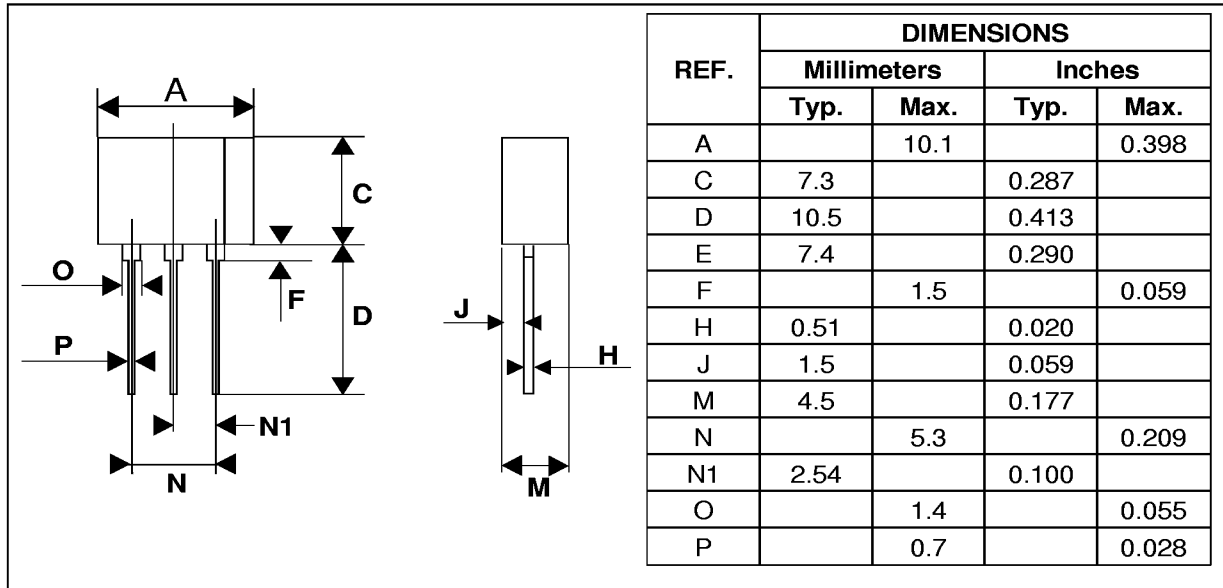
**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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



**PACKAGE MECHANICAL DATA**  
TO202-3 (Plastic)



Marking : type number  
Weight : 1 g

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1998 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

