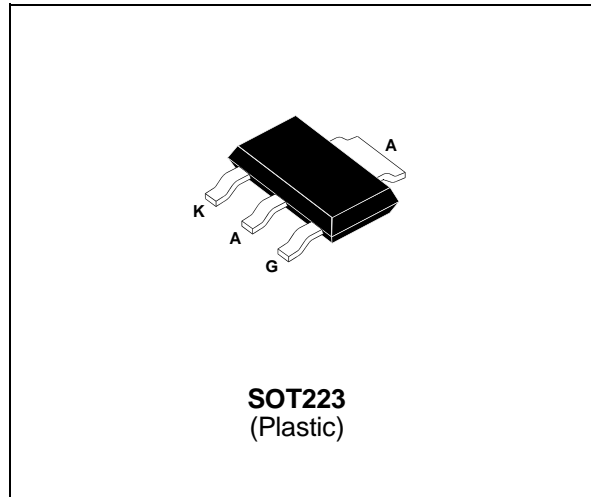


**SENSITIVE GATE SCR**
**FEATURES**

- $I_{T(RMS)} = 1.4A$
- $V_{DRM} = 200V$  to  $800V$
- Low  $I_{GT} < 200 \mu A$

**DESCRIPTION**

The X02xxxN series of SCRs uses a high performance TOP GLASS PNP technology. These parts are intended for general purpose high volume applications using surface mount technology.


**ABSOLUTE RATINGS** (limiting values)

Symbol	Parameter	Value	Unit	
$I_{T(RMS)}$ *	RMS on-state current (180° conduction angle)	$T_{tab} = 90^{\circ}C$	1.4	A
		$T_a = 75^{\circ}C$	1.0	A
$I_{T(AV)}$ *	Mean on-state current (180° conduction angle)	$T_{tab} = 90^{\circ}C$	0.9	A
		$T_a = 75^{\circ}C$	0.64	A
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = $25^{\circ}C$ )	$t_p = 8.3$ ms	25	A
		$t_p = 10$ ms	22.5	A
$I^2t$	$I^2t$ Value for fusing	$t_p = 10$ ms	2.5	$A^2s$
$di/dt$	Critical rate of rise of on-state current $I_G = 10$ mA $di_G/dt = 0.1$ A/ $\mu s$ .	30	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	260	$^{\circ}C$	

\* : With  $5cm^2$  copper ( $e=35\mu m$ ) surface under tab.

Symbol	Parameter	Voltage				Unit
		B	D	M	N	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125^{\circ}C$ $R_{GK} = 1K\Omega$	200	400	600	800	V

## X02xxxN

### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
Rth(j-a)	Junction to ambient *	60	°C/W
Rth(j-t)	Junction to tab for DC	25	°C/W

\* : With 5cm<sup>2</sup> copper (e=35μm) surface under tab.

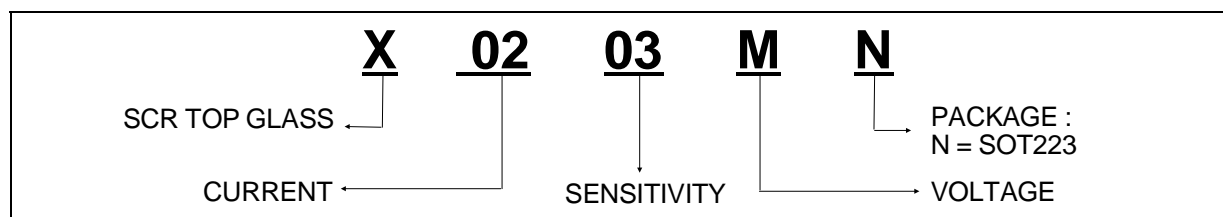
### GATE CHARACTERISTICS (maximum values)

$P_G (AV) = 0.2 \text{ W}$   $P_{GM} = 3 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )  $I_{GM} = 1.2 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )

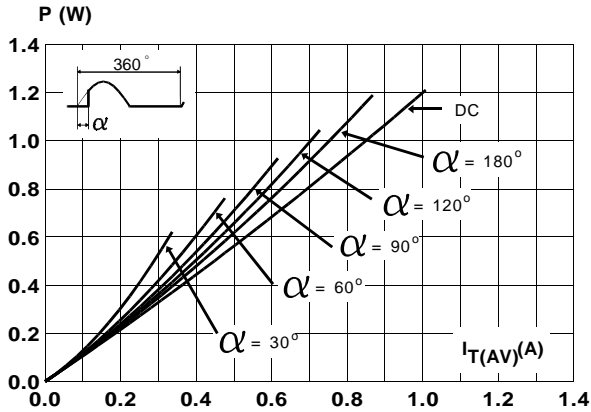
### ELECTRICAL CHARACTERISTICS

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>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ R <sub>GK</sub> = 1 KΩ	T <sub>j</sub> = 125°C	MIN	0.1			V	
V <sub>RGM</sub>	I <sub>RG</sub> = 10μA	T <sub>j</sub> = 25°C	MIN	8			V	
t <sub>gd</sub>	V <sub>D</sub> =V <sub>DRM</sub> I <sub>TM</sub> = 3 x I <sub>T(AV)</sub> dI <sub>G</sub> /dt = 0.1A/μs I <sub>G</sub> = 10mA	T <sub>j</sub> = 25°C	TYP	0.5			μs	
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> = 2.8A t <sub>p</sub> = 380μs	T <sub>j</sub> = 25°C	MAX	1.5			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			μA	
dV/dt	V <sub>D</sub> =67%V <sub>DRM</sub> R <sub>GK</sub> = 1 KΩ	T <sub>j</sub> = 110°C	TYP	15	20	15	V/μs	
t <sub>q</sub>	I <sub>TM</sub> = 3 x I <sub>T(AV)</sub> V <sub>R</sub> =35V dI/dt=10A/μs t <sub>p</sub> =100μs dV/dt=2V/μs V <sub>D</sub> = 67%V <sub>DRM</sub> R <sub>GK</sub> = 1 KΩ	T <sub>j</sub> = 110°C	MAX	100			μs	

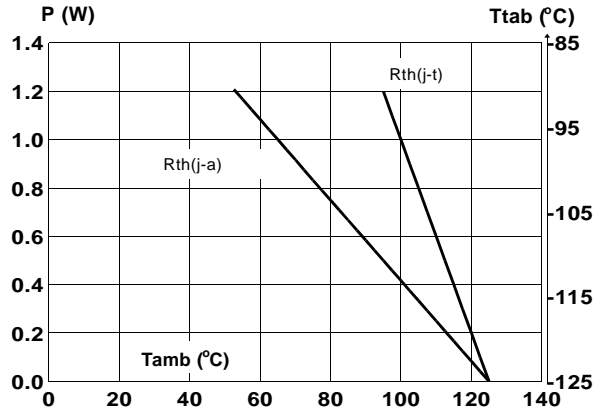
### ORDERING INFORMATION



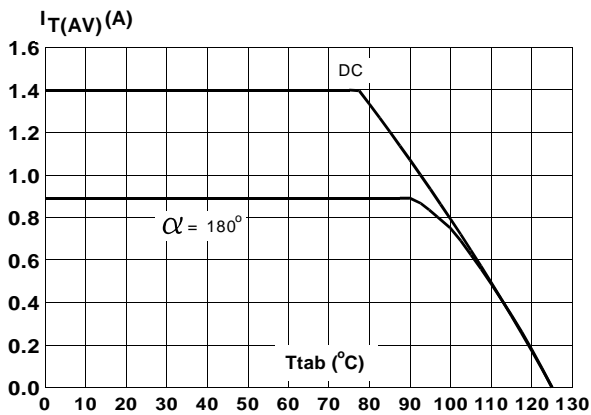
**Fig.1** : Maximum average power dissipation versus average on-state current.



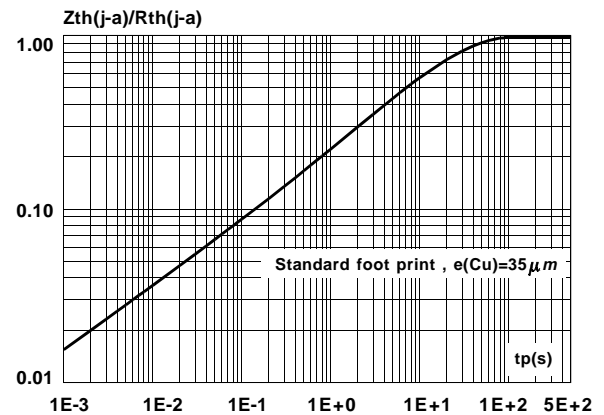
**Fig.2** : Correlation between maximum average power dissipation and maximum allowable temperature ( $T_{amb}$  and  $T_{tab}$ ).



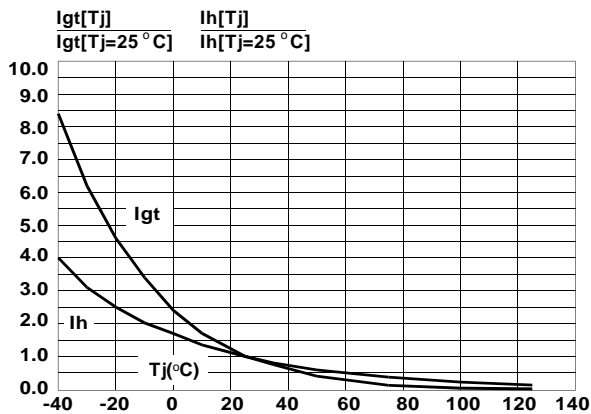
**Fig.3** : Average on-state current versus tab temperature.



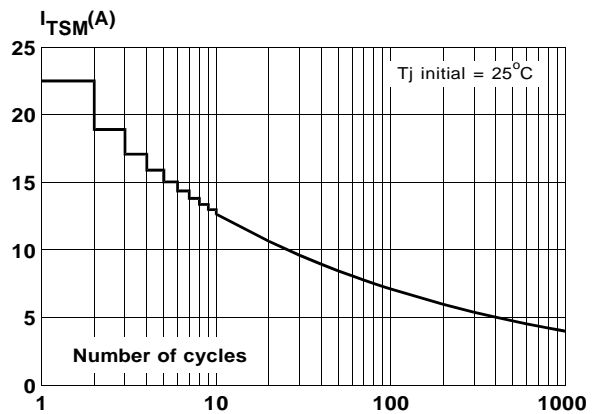
**Fig.4** : Relative variation of thermal impedance junction to ambient versus pulse duration.



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

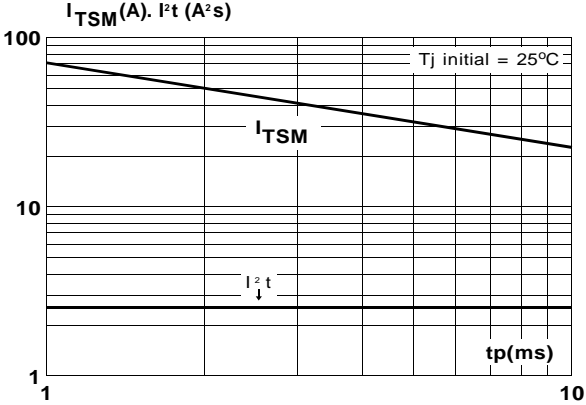


**Fig.6** : Non repetitive surge peak on-state current versus number of cycles.

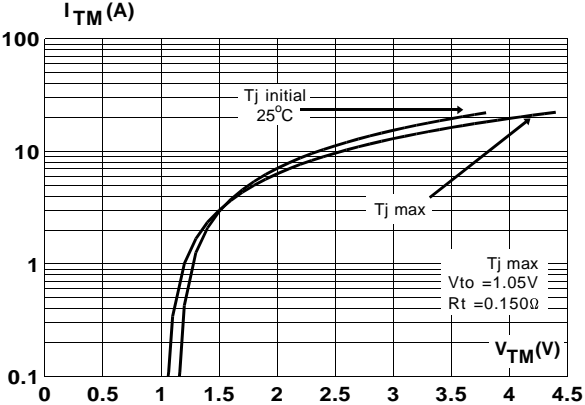


**X02xxxN**

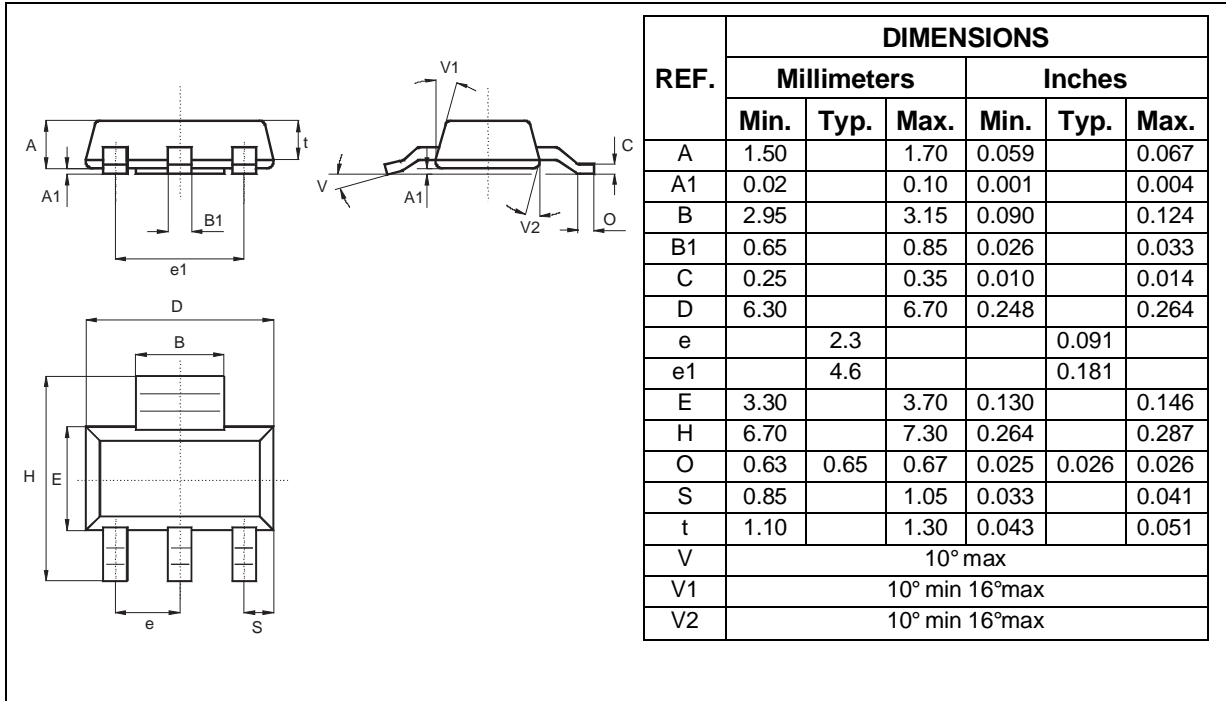
**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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

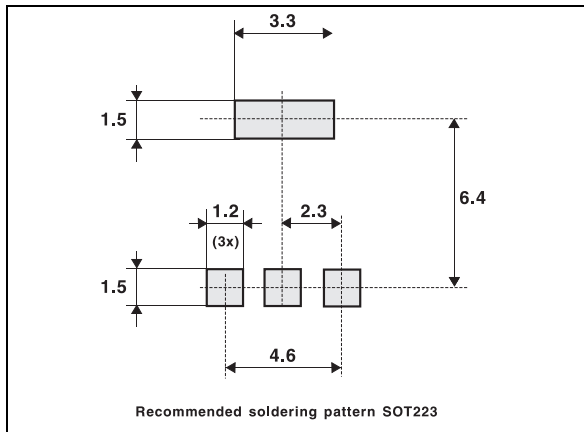


**PACKAGE MECHANICAL DATA**  
SOT223 (Plastic)



Weight : 0.11 g

**FOOT PRINT**



**MARKING**

Type	Marking
X0202BN	X2B
X0202DN	X2D
X0202MN	X2M
X0202NN	X2N
X0203BN	X3B
X0203DN	X3D
X0203MN	X3M
X0203NN	X3N
X0205BN	X5B
X0205DN	X5D
X0205MN	X5M
X0205NN	X5N

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