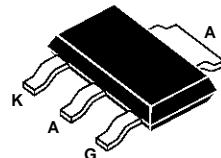


SENSITIVE GATE SCR

FEATURES

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



SOT223
(Plastic)

DESCRIPTION

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

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value		Unit
$I_T(\text{RMS})^*$	RMS on-state current (180° conduction angle)	$T_{\text{tab}} = 90^\circ\text{C}$	1.4	A
		$T_a = 75^\circ\text{C}$	1.0	A
$I_T(\text{AV})^*$	Mean on-state current (180° conduction angle)	$T_{\text{tab}} = 90^\circ\text{C}$	0.9	A
		$T_a = 75^\circ\text{C}$	0.64	A
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25°C)	$t_p = 8.3 \text{ ms}$	25	A
		$t_p = 10 \text{ ms}$	22.5	A
I^2t	I^2t Value for fusing	$t_p = 10 \text{ ms}$	2.5	A^2s
di/dt	Critical rate of rise of on-state current $I_G = 10 \text{ mA}$ $di_G/dt = 0.1 \text{ A}/\mu\text{s}$.		30	$\text{A}/\mu\text{s}$
T_{stg} T_j	Storage and operating junction temperature range		- 40, + 150 - 40, + 125	$^\circ\text{C}$
TI	Maximum lead temperature for soldering during 10s		260	$^\circ\text{C}$

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

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

X02xxxN

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R _{th(j-a)}	Junction to ambient *	60	°C/W
R _{th(j-t)}	Junction to tab for DC	25	°C/W

* : With 5cm² copper ($e=35\mu m$) surface under tab.

GATE CHARACTERISTICS (maximum values)

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

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions	Sensitivity			Unit
		02	03	05	
I _{GT}	V _D =12V (DC) R _L =140Ω	T _j = 25°C	MIN		20 20
			MAX	200 200	50
V _{GT}	V _D =12V (DC) R _L =140Ω	T _j = 25°C	MAX	0.8	
V _{GD}	V _D =V _{DRM} R _L =3.3kΩ R _{GK} = 1 kΩ	T _j = 125°C	MIN	0.1	
V _{RGM}	I _{RG} = 10μA	T _j = 25°C	MIN	8	
t _{gd}	V _D =V _{DRM} I _{TM} = 3 x I _{T(AV)} dI _G /dt = 0.1A/μs I _G = 10mA	T _j = 25°C	TYP	0.5	
I _H	I _T = 50mA R _{GK} = 1 kΩ	T _j = 25°C	MAX	5	
I _L	I _G =1mA R _{GK} = 1 kΩ	T _j = 25°C	MAX	6	
V _{TM}	I _{TM} = 2.8A tp= 380μs	T _j = 25°C	MAX	1.5	
I _{DRM} I _{RRM}	V _D = V _{DRM} R _{GK} = 1 kΩ V _R = V _{RRM}	T _j = 25°C	MAX	5	
		T _j = 110°C	MAX	200	
dV/dt	V _D =67%V _{DRM} R _{GK} = 1 kΩ	T _j = 110°C	TYP	15 20 15	V/μs
t _q	I _{TM} = 3 x I _{T(AV)} V _R =35V dI/dt=10A/μs tp=100μs dV/dt=2V/μs V _D = 67%V _{DRM} R _{GK} = 1 kΩ	T _j = 110°C	MAX	100	

ORDERING INFORMATION

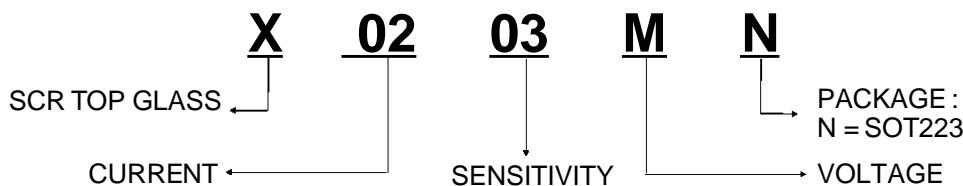


Fig.1 : Maximum average power dissipation versus average on-state current.

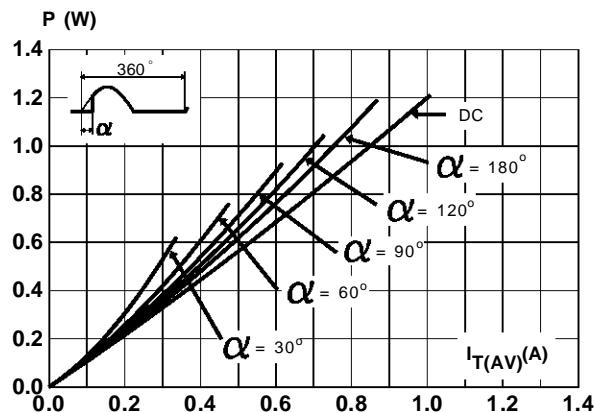


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Ttab).

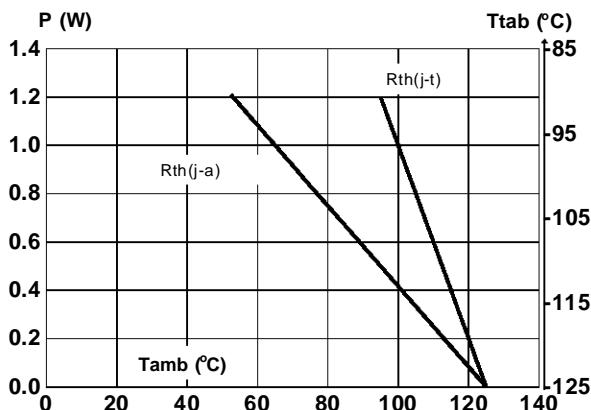


Fig.3 : Average on-state current versus tab temperature.

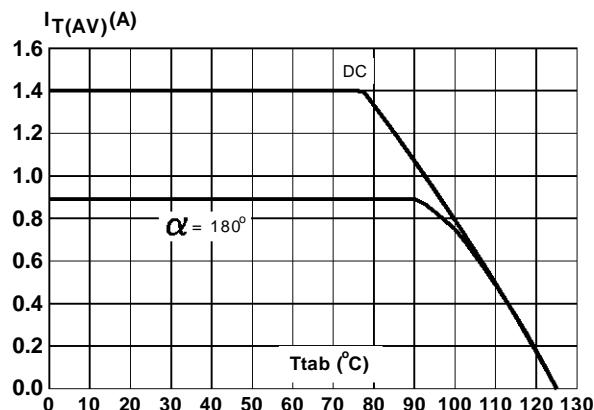


Fig.4 : Relative variation of thermal impedance junction to ambient versus pulse duration.

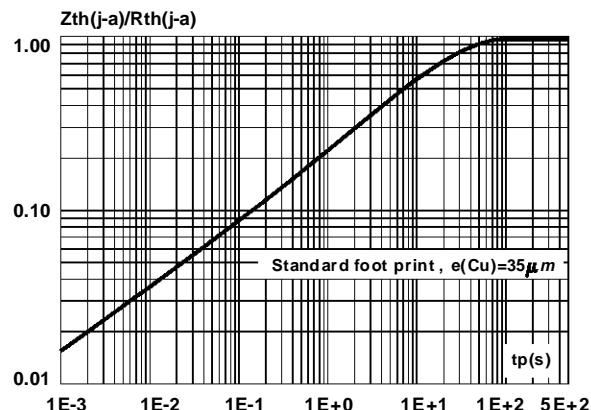


Fig.5 : Relative variation of gate trigger current and holding current versus junction temperature.

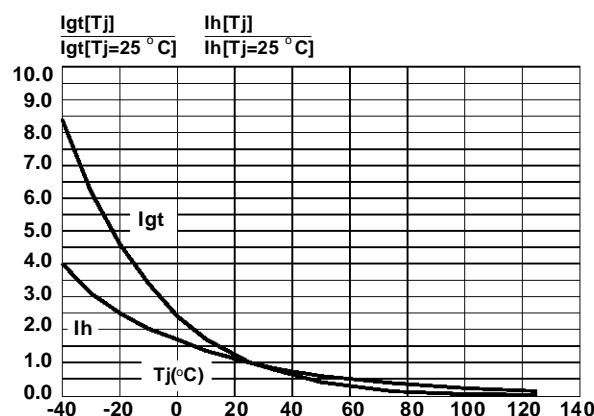
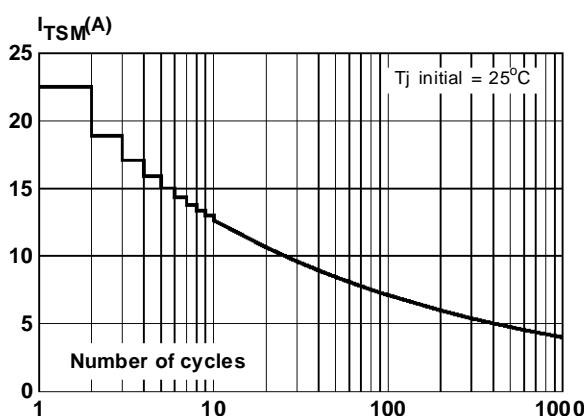


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.



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 .

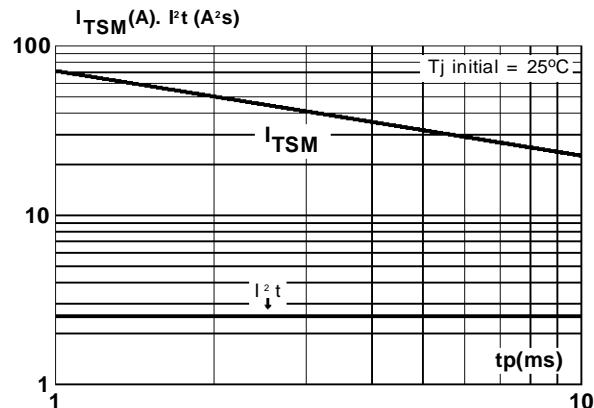
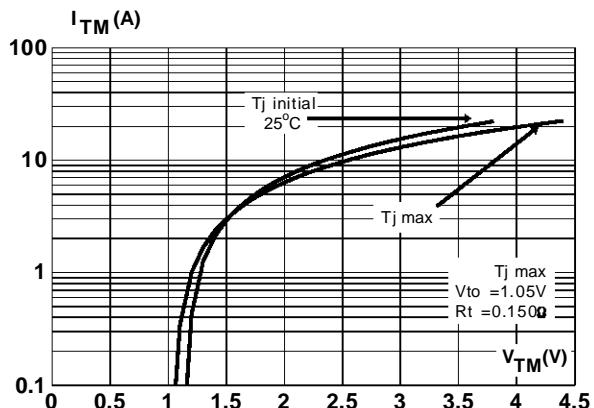
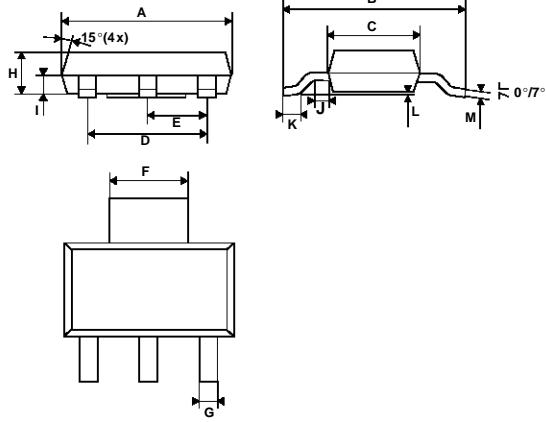


Fig.8 : On-state characteristics (maximum values).



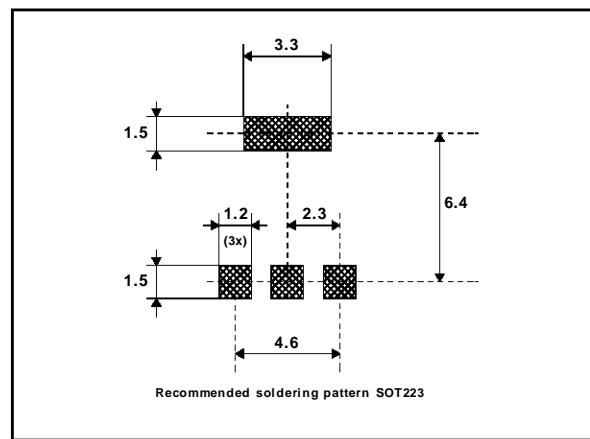
PACKAGE MECHANICAL DATA
SOT223 (Plastic)



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.30	6.50	6.70	0.248	0.256	0.264
B	6.70	7.00	7.30	0.264	0.275	0.287
C	3.30	3.50	3.70	0.130	0.139	0.146
D		4.60			0.181	
E		2.30			0.090	
F	2.90	3.00	3.10	0.114	0.118	0.122
G	0.60	0.70	0.80	0.023	0.027	0.031
H	1.50	1.60	1.70	0.059	0.063	0.067
I	0.43	0.45	0.47	0.017	0.018	0.019
J	0.50	0.60	0.70	0.019	0.023	0.027
K	0.63	0.65	0.67	0.024	0.025	0.026
L		0.05			0.002	
M			0.32			0.012

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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