

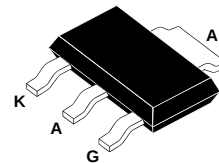
SENSITIVE GATE SCR

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.



SOT223
(Plastic)

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/ μs .		30	A/ μs
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 5cm² 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_{GT}	$V_D = 12\text{V (DC)}$ $R_L = 140\Omega$	$T_j = 25^\circ\text{C}$	MIN			20	20	μA
			MAX		200	200	50	
V_{GT}	$V_D = 12\text{V (DC)}$ $R_L = 140\Omega$	$T_j = 25^\circ\text{C}$	MAX		0.8			V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3\text{k}\Omega$ $R_{GK} = 1 \text{ K}\Omega$	$T_j = 125^\circ\text{C}$	MIN		0.1			V
V_{RGM}	$I_{RG} = 10\mu\text{A}$	$T_j = 25^\circ\text{C}$	MIN		8			V
tgδ	$V_D = V_{DRM}$ $I_{TM} = 3 \times I_{T(AV)}$ $dl_G/dt = 0.1\text{A}/\mu\text{s}$ $I_G = 10\text{mA}$	$T_j = 25^\circ\text{C}$	TYP		0.5			μs
I_H	$I_T = 50\text{mA}$ $R_{GK} = 1 \text{ K}\Omega$	$T_j = 25^\circ\text{C}$	MAX		5			mA
I_L	$I_G = 1\text{mA}$ $R_{GK} = 1 \text{ K}\Omega$	$T_j = 25^\circ\text{C}$	MAX		6			mA
V_{TM}	$I_{TM} = 2.8\text{A}$ $t_p = 380\mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX		1.5			V
I_{DRM} I_{RRM}	$V_D = V_{DRM}$ $R_{GK} = 1 \text{ K}\Omega$ $V_R = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX		5			μA
		$T_j = 110^\circ\text{C}$	MAX		200			μA
dV/dt	$V_D = 67\%V_{DRM}$ $R_{GK} = 1 \text{ K}\Omega$	$T_j = 110^\circ\text{C}$	TYP		15	20	15	V/ μs
tq	$I_{TM} = 3 \times I_{T(AV)}$ $V_R = 35\text{V}$ $dl/dt = 10\text{A}/\mu\text{s}$ $t_p = 100\mu\text{s}$ $dV/dt = 2\text{V}/\mu\text{s}$ $V_D = 67\%V_{DRM}$ $R_{GK} = 1 \text{ K}\Omega$	$T_j = 110^\circ\text{C}$	MAX		100			μs

ORDERING INFORMATION

	X	02	03	M	N	
SCR TOP GLASS	←				→	PACKAGE : N = SOT223
CURRENT	←				→	VOLTAGE
			SENSITIVITY			

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

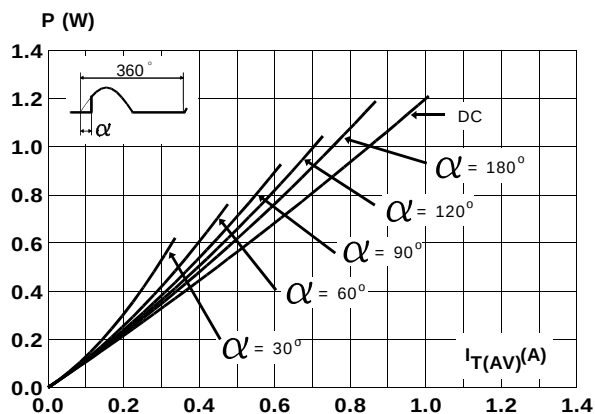


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperature (T_{amb} and T_{tab}).

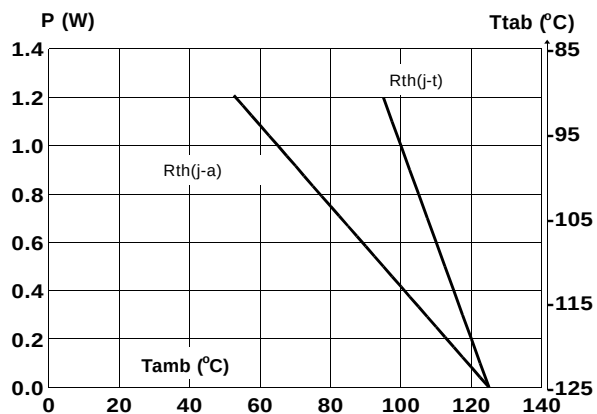


Fig.3 : Average on-state current versus tab temperature.

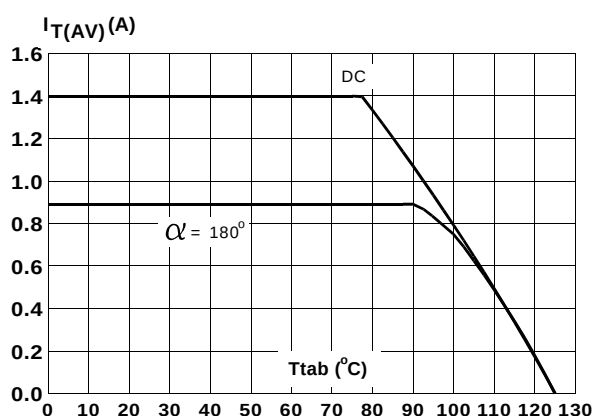


Fig.4 : Relative variation of thermal impedance junction to ambient versus pulse duration.

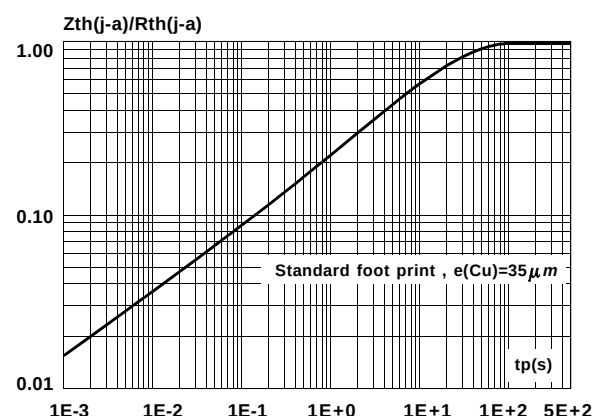


Fig.5 : Relative variation of gate trigger current and holding current versus junction temperature.

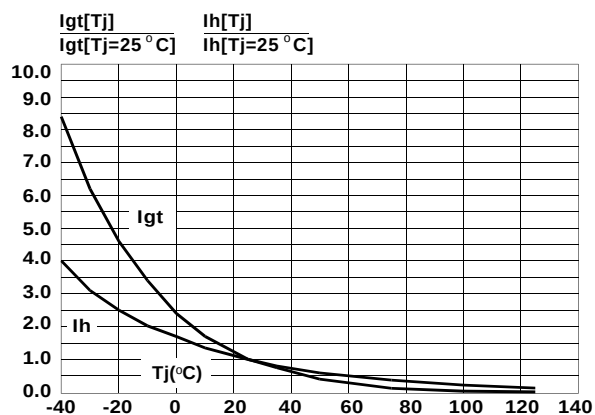


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.

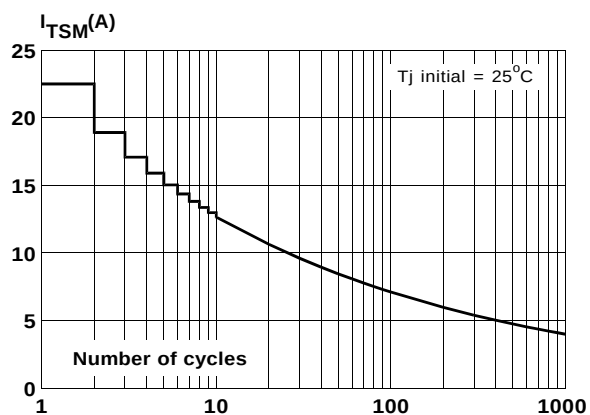


Fig.7 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t_p \leq 10\text{ms}$, and corresponding value of I^2t .

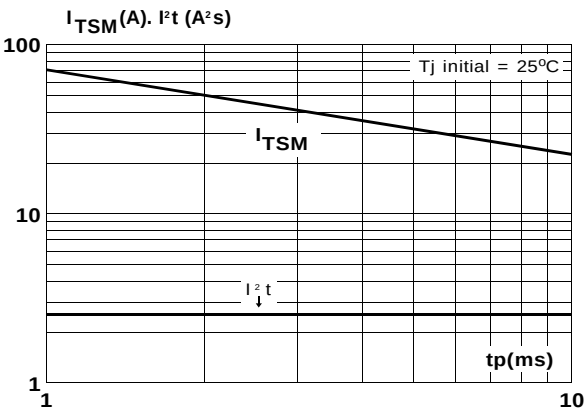
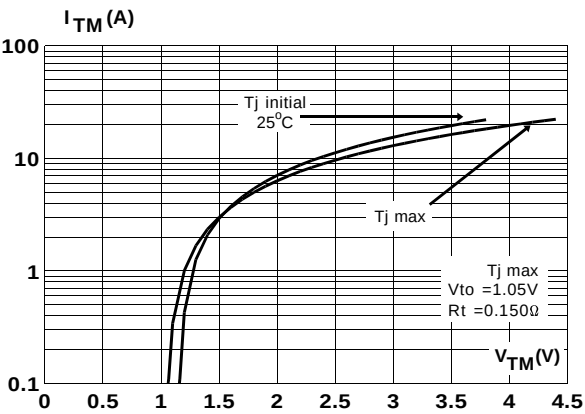
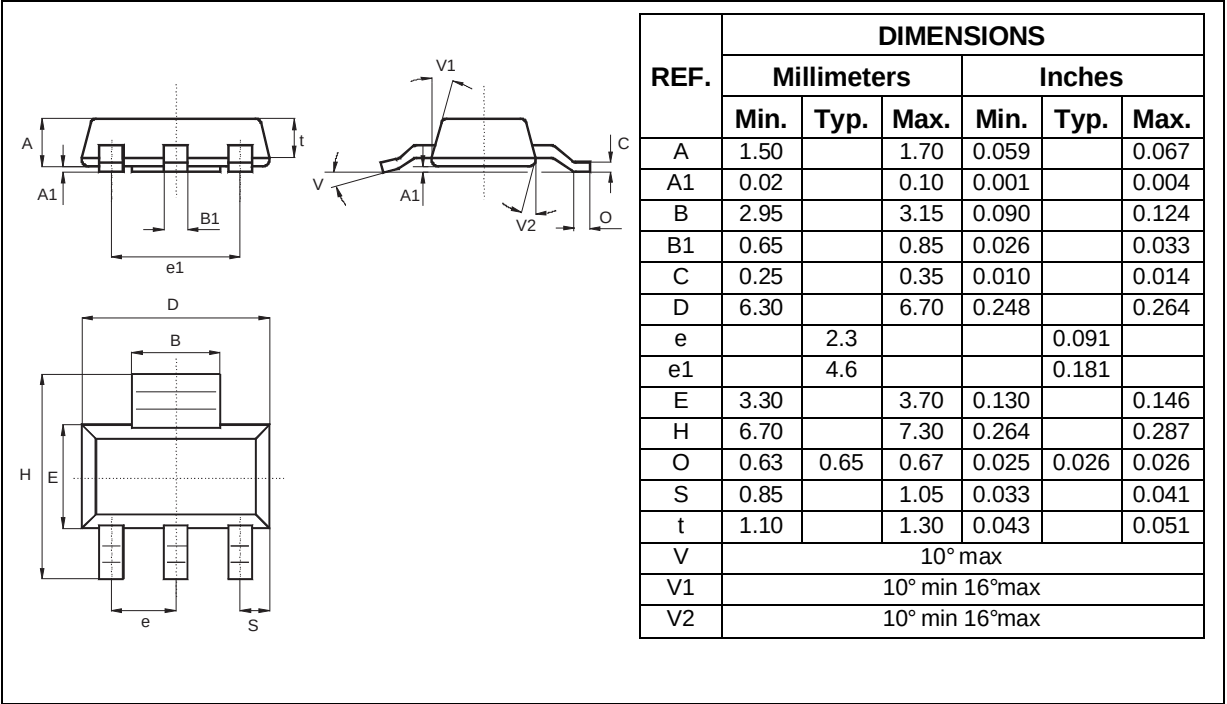


Fig.8 : On-state characteristics (maximum values).



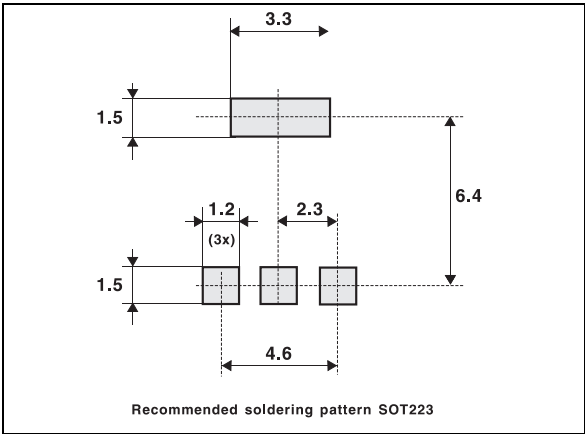
PACKAGE MECHANICAL DATA
SOT223 (Plastic)



Weight : 0.11 g

MARKING

FOOT PRINT



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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