

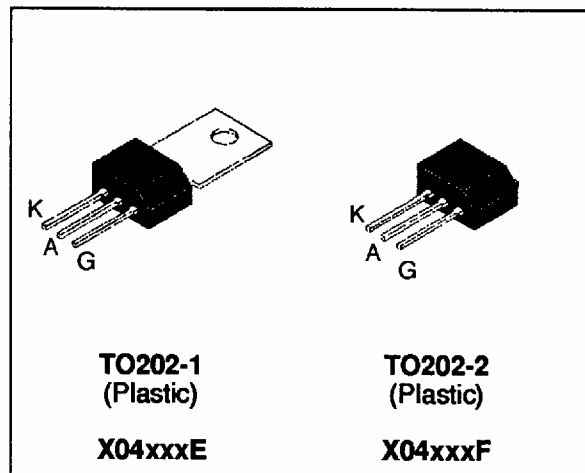
SENSITIVE GATE SCR

FEATURES

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

DESCRIPTION

The X04xxxE/F 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.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)	X04xxxE/F	$T_c = 90^\circ C$	4	A
		X04xxxF	$T_a = 25^\circ C$	1.35	
$I_{T(AV)}$	Mean on-state current (180° conduction angle)	X04xxxE/F	$T_c = 90^\circ C$	2.5	A
		X04xxxF	$T_a = 25^\circ C$	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/ μs .	50			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 at 4.5mm from case	260			$^\circ C$

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

X04xxxE/F**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
Rth(j-a)	Junction to ambient	X04xxxE	80	°C/W
		X04xxxF	100	
Rth(j-c)	Junction to case for DC		7.5	°C/W

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}	$V_D=12V$ (DC) $R_L=140\Omega$	$T_j= 25^{\circ}C$	MIN		20	20	μA
			MAX	200	200	50	
V_{GT}	$V_D=12V$ (DC) $R_L=140\Omega$	$T_j= 25^{\circ}C$	MAX	0.8			V
V_{GD}	$V_D=V_{DRM}$ $R_L=3.3k\Omega$ $R_{GK} = 1 K\Omega$	$T_j= 125^{\circ}C$	MIN	0.1			V
V_{RGM}	$I_{RG} = 10\mu A$	$T_j= 25^{\circ}C$	MIN	8			V
t_{gd}	$V_D=V_{DRM}$ $I_{TM}= 3 \times I_{T(AV)}$ $di_G/dt = 0.1A/\mu s$ $I_G = 10mA$	$T_j= 25^{\circ}C$	MAX	2			μs
I_H	$I_T= 50mA$ $R_{GK} = 1 K\Omega$	$T_j= 25^{\circ}C$	MAX	5			mA
I_L	$I_G=1mA$ $R_{GK} = 1 K\Omega$	$T_j= 25^{\circ}C$	MAX	6			mA
V_{TM}	$I_{TM}= 8A$ $t_p= 380\mu s$	$T_j= 25^{\circ}C$	MAX	1.8			V
I_{DRM} I_{RRM}	$V_D = V_{DRM}$ $R_{GK} = 1 K\Omega$ $V_R = V_{RRM}$	$T_j= 25^{\circ}C$	MAX	5			μA
		$T_j= 110^{\circ}C$	MAX	200			
dV/dt	$V_D=67\%V_{DRM}$ $R_{GK} = 1 K\Omega$	$T_j= 110^{\circ}C$	MIN			10	$V/\mu s$
			TYP	15	20	15	
t_q	$I_{TM}= 3 \times I_{T(AV)}$ $V_R=35V$ $dI/dt=10A/\mu s$ $t_p=100\mu s$ $dV/dt=2V/\mu s$ $V_D= 67\%V_{DRM}$ $R_{GK} = 1 K\Omega$	$T_j= 110^{\circ}C$	MAX	50			μs

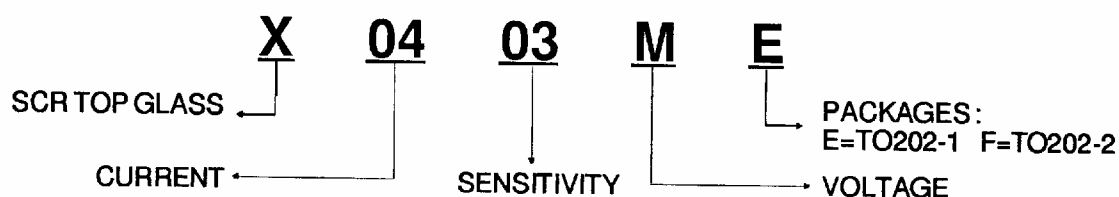
ORDERING INFORMATION

Fig.1 : Maximum average power dissipation versus average on-state current (TO202-1).

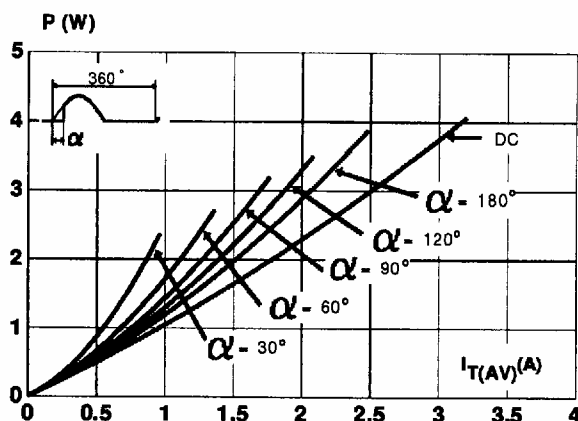


Fig.3 : Maximum average power dissipation versus average on-state current (TO202-2).

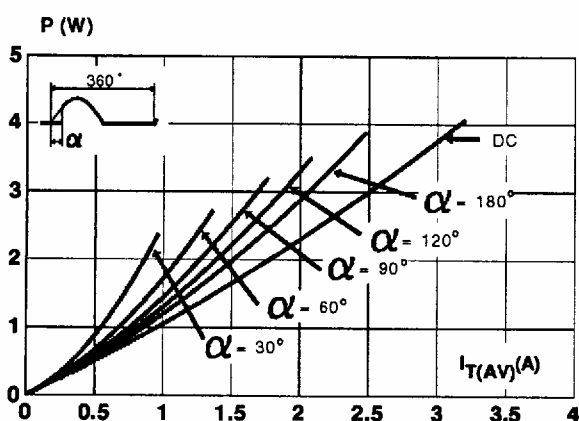


Fig.5 : Average on-state current versus case temperature (TO202-1).

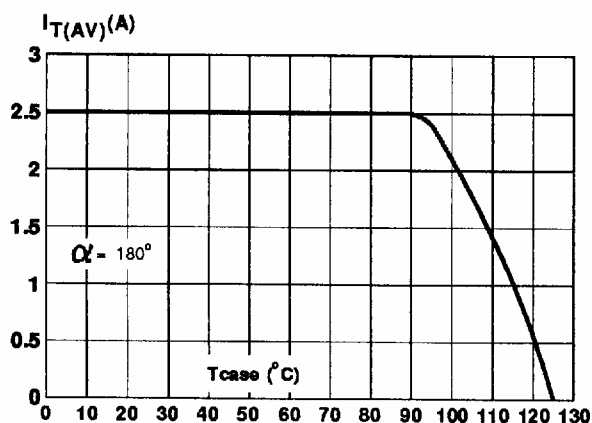


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperature (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (TO202-1).

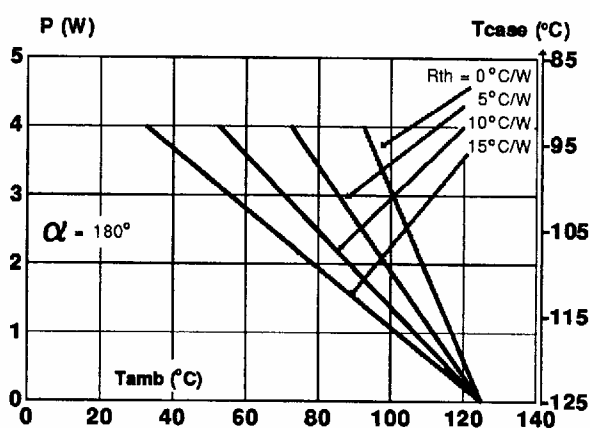


Fig.4 : Correlation between maximum average power dissipation and maximum allowable temperature (T_{amb} and T_{case}) (TO202-2).

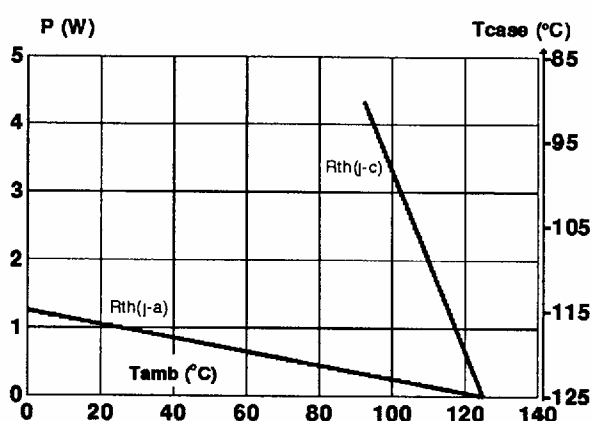


Fig.6 : Average on-state current versus case temperature (TO202-2).

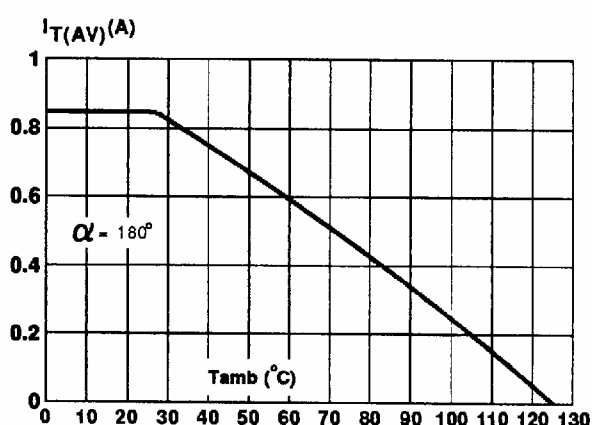


Fig.7 : Relative variation of thermal impedance versus pulse duration (TO202-1).

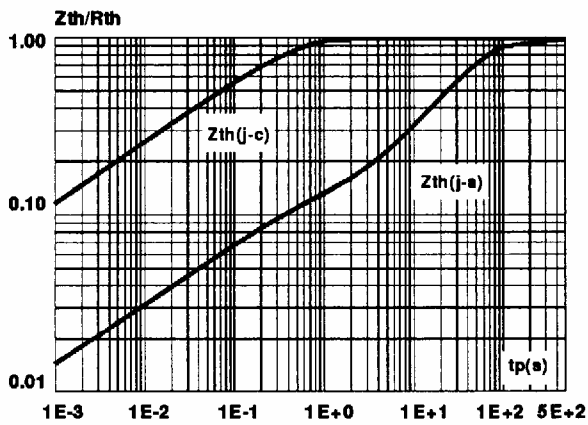


Fig.9 : Relative variation of gate trigger current and holding current versus junction temperature.

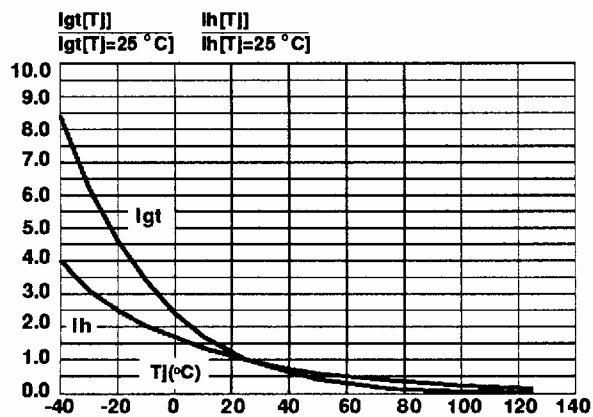


Fig.11 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t_p \leq 10\text{ms}$, and corresponding value of $I^2 t$.

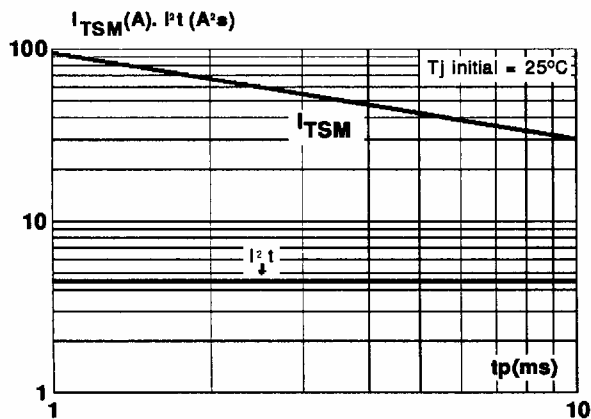


Fig.8 : Relative variation of thermal impedance junction to ambient versus pulse duration (TO202-2).

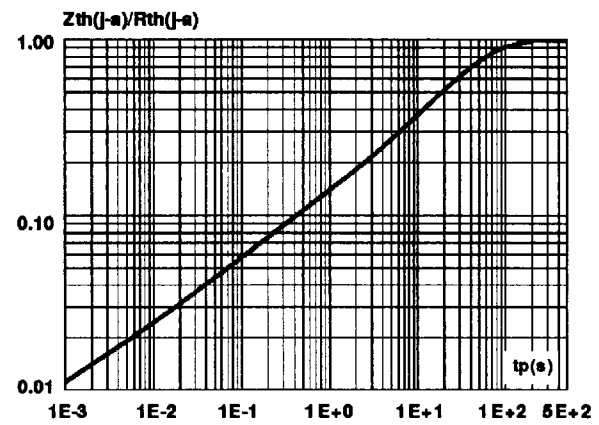


Fig.10 : Non repetitive surge peak on-state current versus number of cycles.

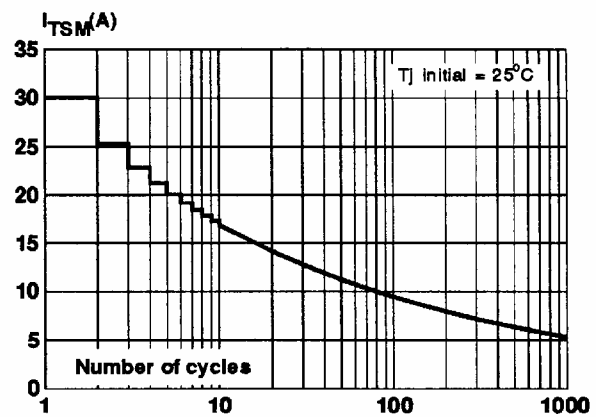
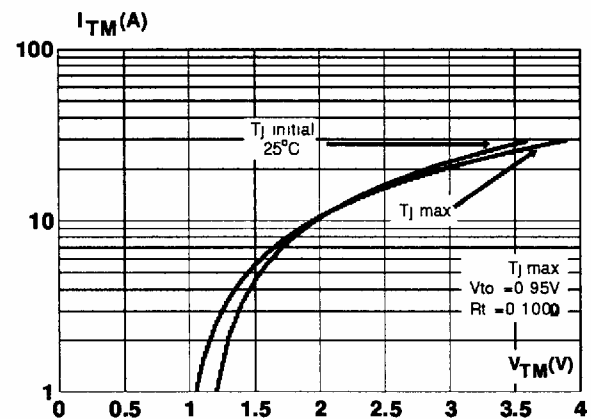
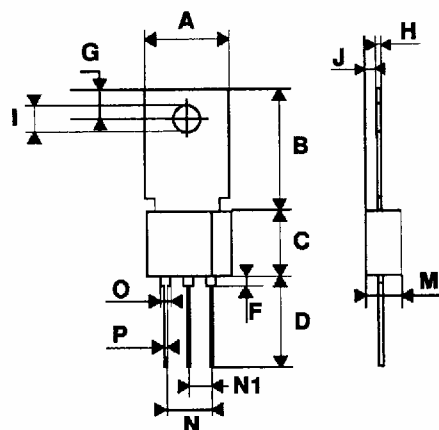


Fig.12 : On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA

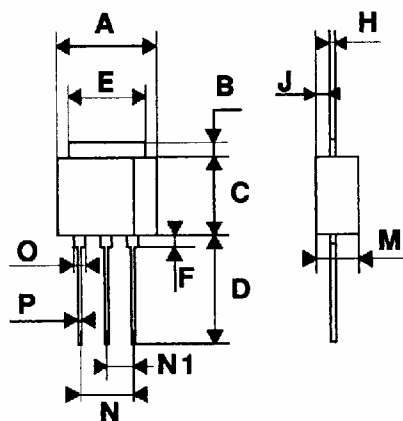
TO202-1 (Plastic)



REF.	DIMENSIONS					
	Millimeters			Inches		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A			10.1			0.398
B	13.7			0.540		
C	7.3			0.287		
D	10.5			0.413		
F			1.5			0.059
G	3.2			0.126		
H	0.51			0.020		
I		3.16	3.20		0.124	0.126
J	1.5			0.059		
M	4.5			0.177		
N			5.3			0.209
N1	2.54			0.100		
O			1.4			0.055
P			0.7			0.028

Marking : type number

Weight : 1.4 g

PACKAGE MECHANICAL DATA
 TO202-2 (Plastic)


REF.	DIMENSIONS					
	Millimeters			Inches		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A			10.1			0.398
B	1.2			0.047		
C	7.3			0.287		
D	10.5			0.413		
E	7.4			0.290		
F			1.5			0.059
H	0.51			0.020		
J	1.5			0.059		
M	4.5			0.177		
N			5.3			0.209
N1	2.54			0.100		
O			1.4			0.055
P			0.7			0.028

Marking : type number
 Weight : 1.0 g

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics 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 SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1995 SGS-THOMSON Microelectronics - All rights reserved.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

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