

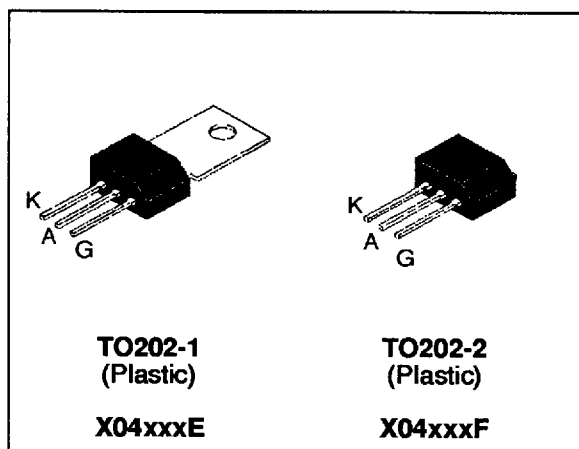
SENSITIVE GATE SCR

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}	$V_D=V_{DRM}$ $R_L=3.3k\Omega$ $R_{GK}=1K\Omega$	$T_j=125^{\circ}C$	MIN	0.1			V
V_{RGM}	$I_{RG}=10\mu A$	$T_j=25^{\circ}C$	MIN	8			V
tgδ	$V_D=V_{DRM}$ $I_{TM}=3\times I_{T(AV)}$ $di/dt=0.1A/\mu s$ $I_G=10mA$	$T_j=25^{\circ}C$	MAX	2			μs
I_H	$I_T=50mA$ $R_{GK}=1K\Omega$	$T_j=25^{\circ}C$	MAX	5			mA
I_L	$I_G=1mA$ $R_{GK}=1K\Omega$	$T_j=25^{\circ}C$	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}	$V_D=V_{DRM}$ $R_{GK}=1K\Omega$ $V_R=V_{RRM}$	$T_j=25^{\circ}C$	MAX	5			μA
		$T_j=110^{\circ}C$	MAX	200			
dV/dt	$V_D=67\%V_{DRM}$ $R_{GK}=1K\Omega$	$T_j=110^{\circ}C$	MIN			10	V/ μs
			TYP	15	20	15	
tq	$I_{TM}=3\times I_{T(AV)}$ $V_R=35V$ $di/dt=10A/\mu s$ $t_p=100\mu s$ $dV/dt=2V/\mu s$ $V_D=67\%V_{DRM}$ $R_{GK}=1K\Omega$	$T_j=110^{\circ}C$	MAX	50			μs

ORDERING INFORMATION

X **04** **03** **M** **E**
 SCR TOP GLASS CURRENT SENSITIVITY VOLTAGE
 PACKAGES:
 E=TO202-1 F=TO202-2

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

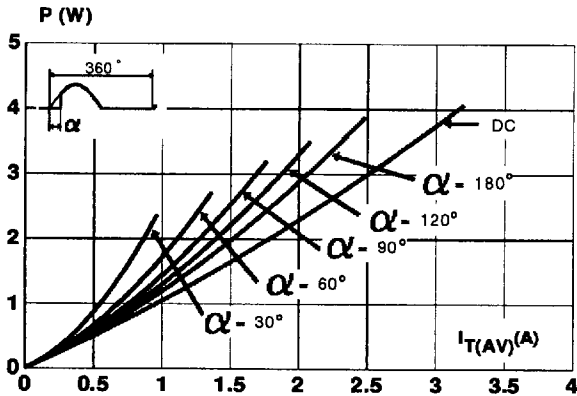


Fig.3 : Maximum average power dissipation versus average on-state current (TO202-2).

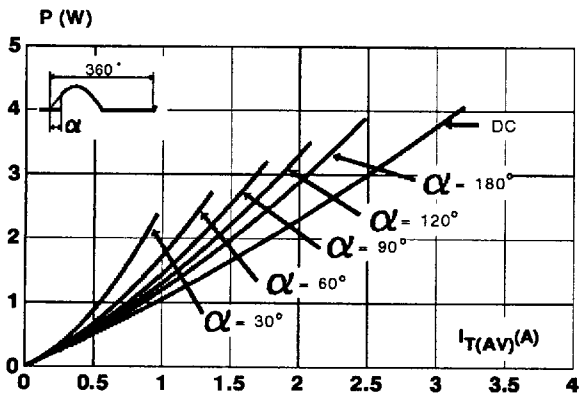


Fig.5 : Average on-state current versus case temperature (TO202-1).

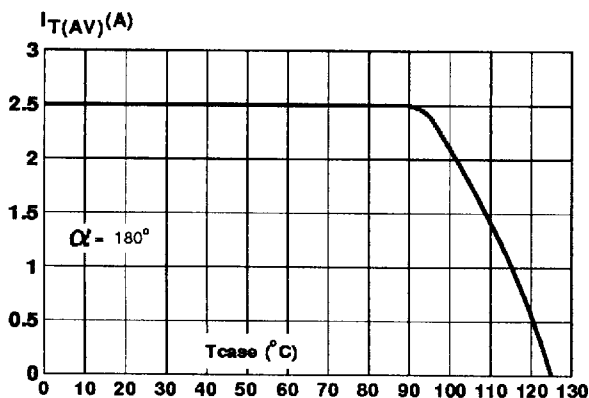


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperature (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (TO202-1).

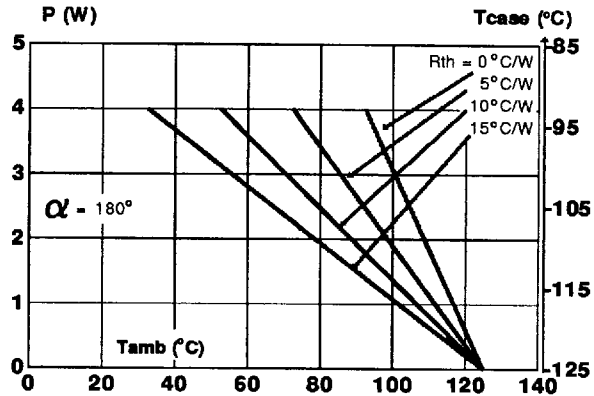


Fig.4 : Correlation between maximum average power dissipation and maximum allowable temperature (T_{amb} and T_{case}) (TO202-2).

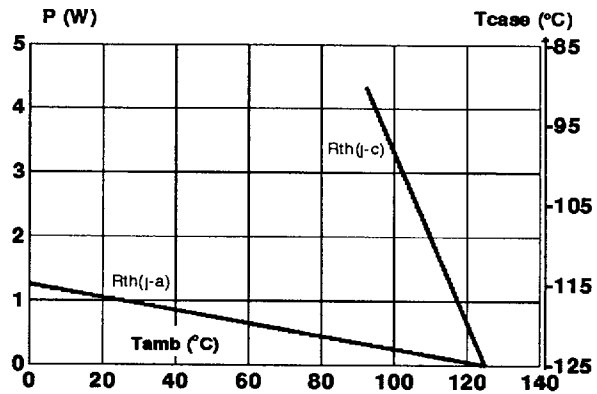


Fig.6 : Average on-state current versus case temperature (TO202-2).

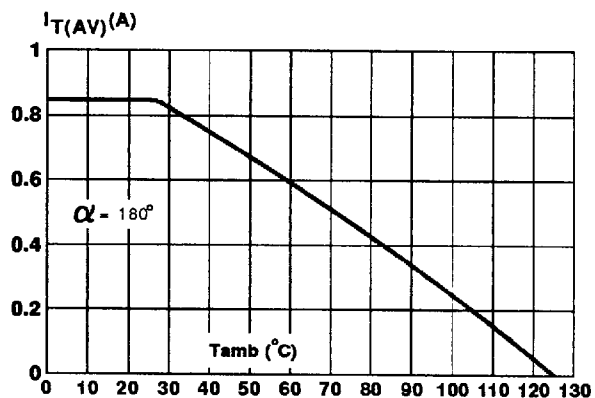
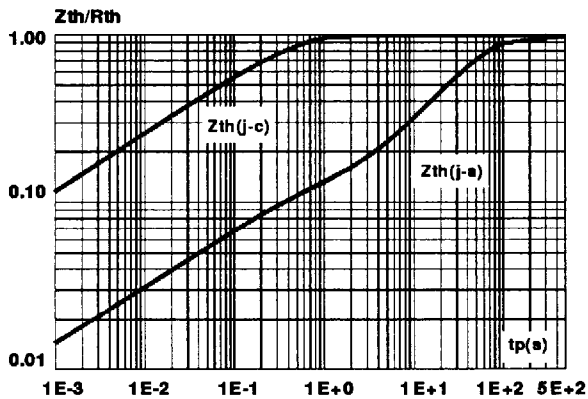
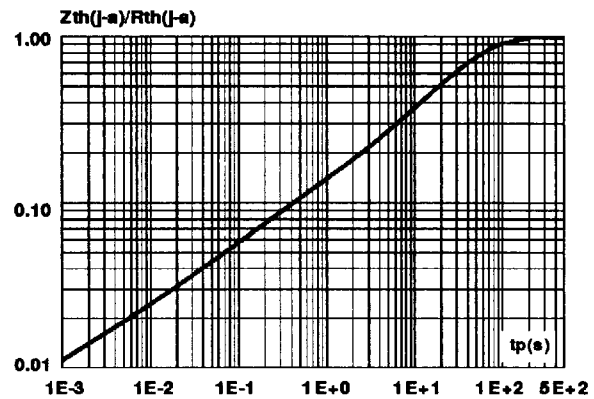
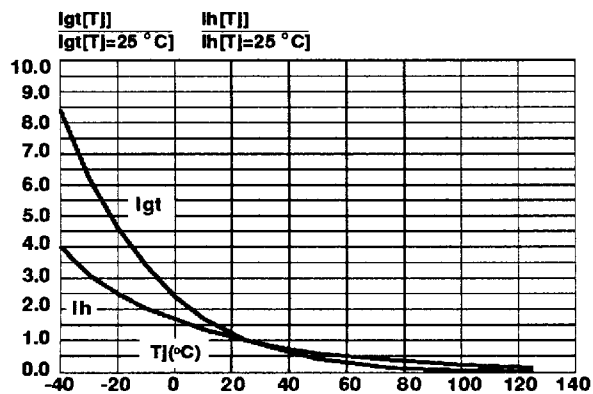
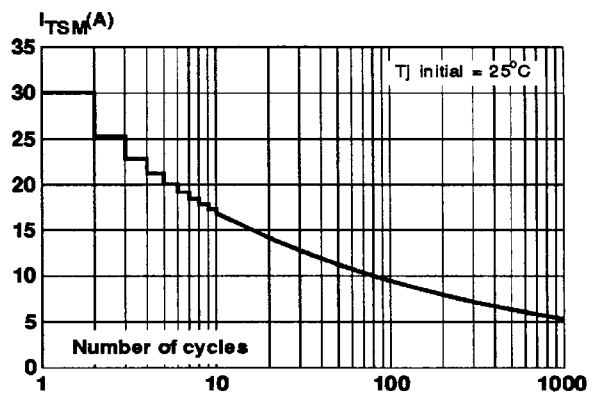
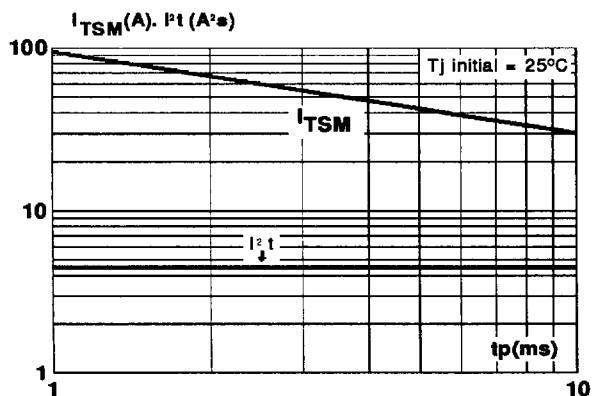
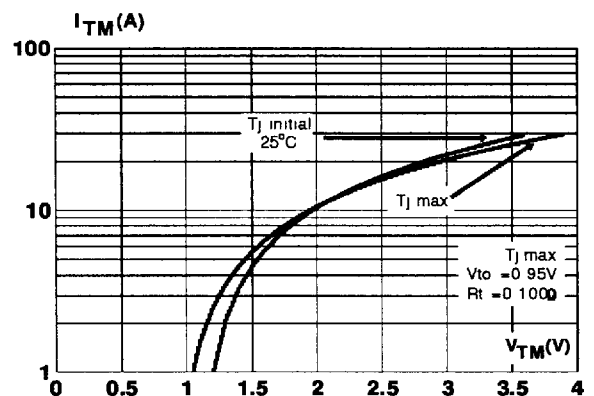
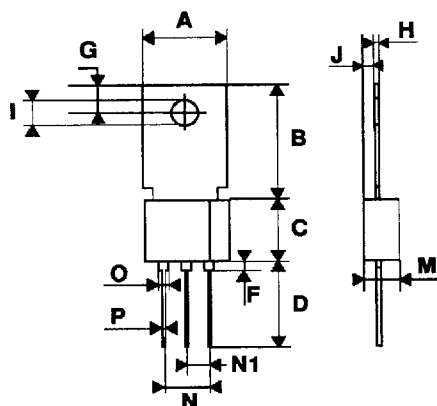


Fig.7 : Relative variation of thermal impedance versus pulse duration (TO202-1).**Fig.8 :** Relative variation of thermal impedance junction to ambient versus pulse duration (TO202-2).**Fig.9 :** Relative variation of gate trigger current and holding current versus junction temperature.**Fig.10 :** Non repetitive surge peak on-state current versus number of cycles.**Fig.11 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t_p \leq 10ms$, and corresponding value of I^2t .**Fig.12 :** On-state characteristics (maximum values).

PACKAGE MECHANICAL DATA

TO202-1 (Plastic)

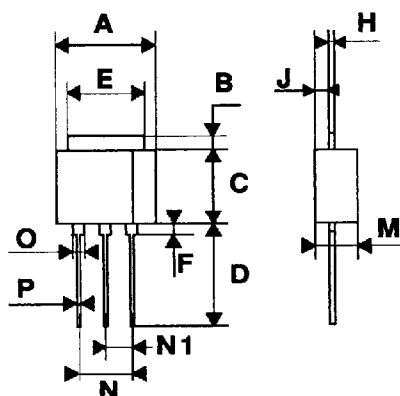


REF.	DIMENSIONS					
	Millimeters			Inches		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A			10.1			0.398
B	13.7			0.540		
C	7.3			0.287		
D	10.5			0.413		
F			1.5			0.059
G	3.2			0.126		
H	0.51			0.020		
I		3.16	3.20		0.124	0.126
J	1.5			0.059		
M	4.5			0.177		
N			5.3			0.209
N1	2.54			0.100		
O			1.4			0.055
P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

Marking : type number
Weight : 1.4 g

X04xxxE/F

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

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