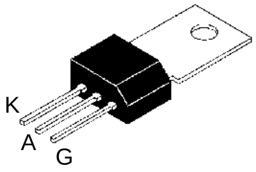
SGS-THOMSON
MICROELECTRONICS

X04xxxE/F

SENSITIVE GATE SCR

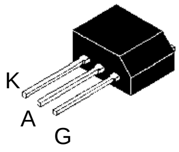
FEATURES

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



TO202-1
(Plastic)

X04xxxE



TO202-2
(Plastic)

X04xxxF

DESCRIPTION

The X04xxxE/F series of SCRs uses a high performance TOP GLASS PNPN 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	Tc= 90°C	4	A
		X04xxxF	Ta= 25°C	1.35	
$I_{T(AV)}$	Mean on-state current (180° conduction angle)	X04xxxE/F	Tc= 90°C	2.5	A
		X04xxxF	Ta= 25°C	0.9	
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25°C)		tp = 8.3 ms	33	A
			tp = 10 ms	30	
I^2t	I^2t Value for fusing		tp = 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	°C
Tl	Maximum lead temperature for soldering during 10s at 4.5mm from case			260	°C

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

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 W P_{GM} = 3 W (tp = 20 µs) I_{GM} = 1.2 A (tp = 20 µs)

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions			Sensitivity			Unit
				02	03	05	
I_{GT}	V_D=12V (DC) R_L=140Ω	Tj= 25°C	MIN		20	20	µA
			MAX	200	200	50	
V_{GT}	V_D=12V (DC) R_L=140Ω	Tj= 25°C	MAX	0.8			V
V_{GD}	V_D=V_{DRM} R_L=3.3kΩ R_{GK} = 1 KΩ	Tj= 125°C	MIN	0.1			V
V_{RGM}	I_{RG} =10µA	Tj= 25°C	MIN	8			V
tgd	V_D=V_{DRM} I_{TM}= 3 x $I_{T(AV)}$ dI_G/dt = 0.1A/µs I_G = 10mA	Tj= 25°C	MAX	2			µs
I_H	I_T= 50mA R_{GK} = 1 KΩ	Tj= 25°C	MAX	5			mA
I_L	I_G=1mA R_{GK} = 1 KΩ	Tj= 25°C	MAX	6			mA
V_{TM}	I_{TM}= 8A tp= 380µs	Tj= 25°C	MAX	1.8			V
I_{DRM} I_{RRM}	V_D = V_{DRM} R_{GK} = 1 KΩ V_R = V_{RRM}	Tj= 25°C	MAX	5			µA
		Tj= 110°C	MAX	200			
dV/dt	V_D=67%V_{DRM} R_{GK} = 1 KΩ	Tj= 110°C	MIN			10	V/µs
			TYP	15	20	15	
tq	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	Tj= 110°C	MAX	50			µs

ORDERING INFORMATION

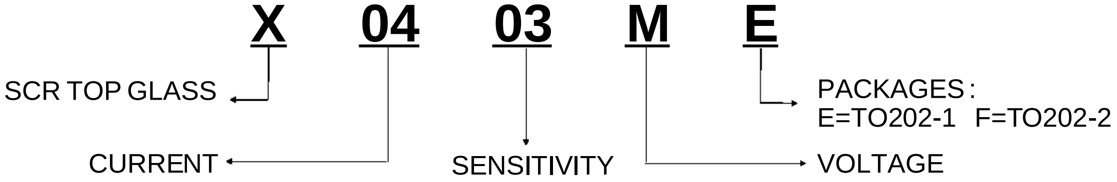


Fig.1 : Maximum average power dissipation versus average on-state current (TO202-1).

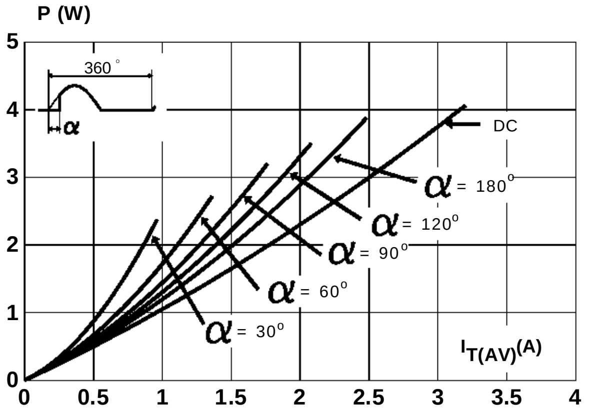


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact (TO202-1).

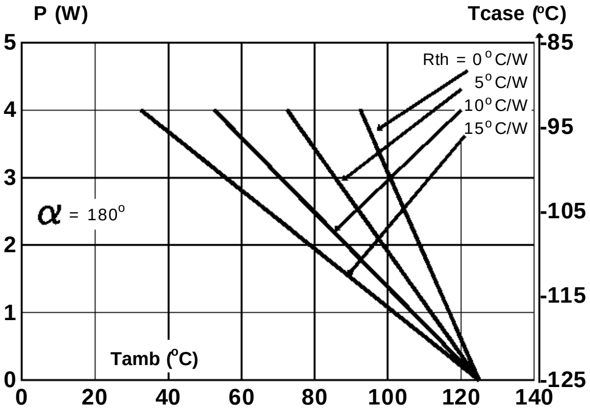


Fig.3 : Maximum average power dissipation versus average on-state current (TO202-2).

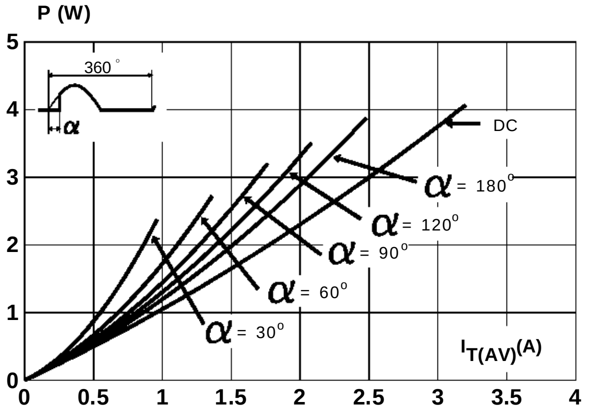


Fig.4 : Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tcase) (TO202-2).

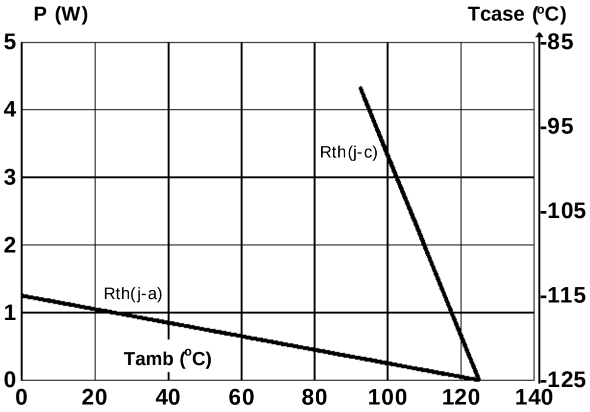


Fig.5 : Average on-state current versus case temperature (TO202-1).

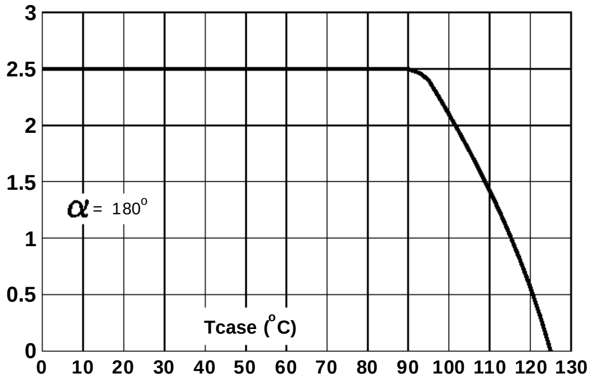


Fig.6 : Average on-state current versus case temperature (TO202-2).

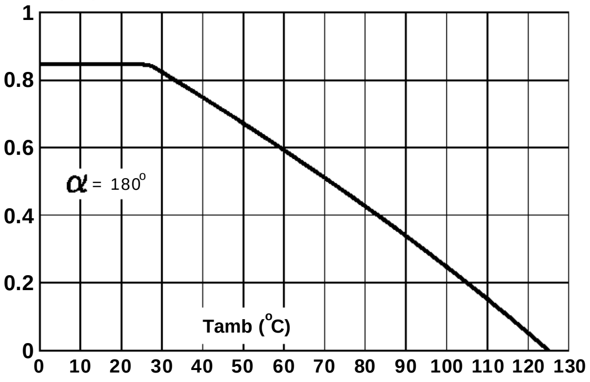


Fig.7 : Relative variation of thermal impedance versus pulse duration (TO202-1).

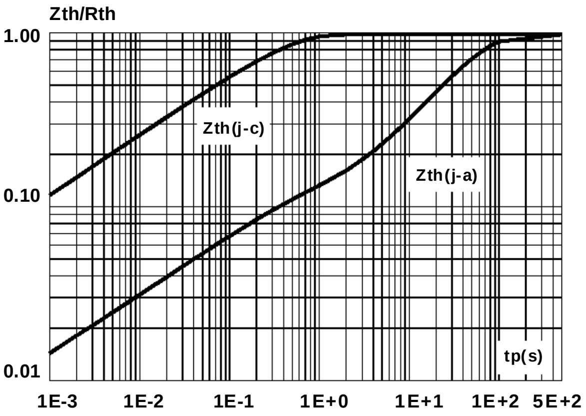


Fig.8 : Relative variation of thermal impedance junction to ambient versus pulse duration (TO202-2).

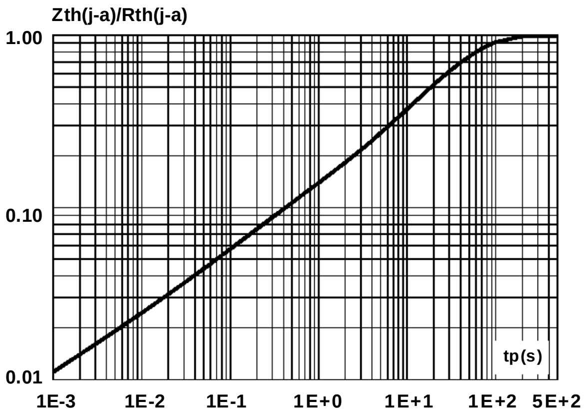


Fig.9 : Relative variation of gate trigger current and holding current versus junction temperature.

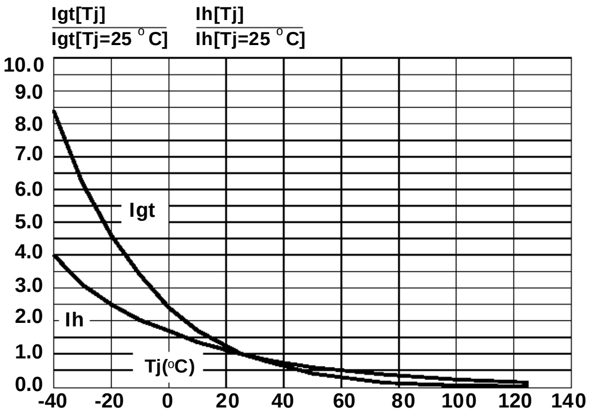


Fig.10 : Non repetitive surge peak on-state current versus number of cycles.

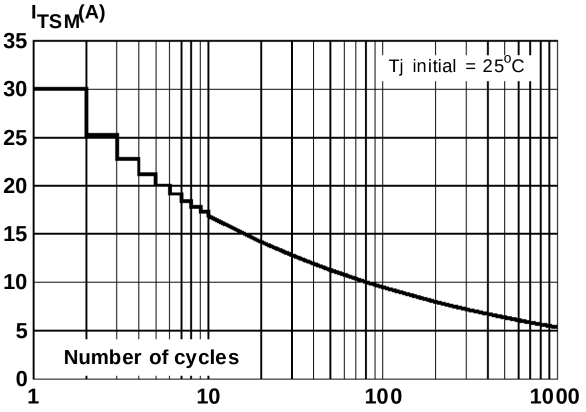


Fig.11 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : tp ≤ 10ms, and corresponding value of I^2t.

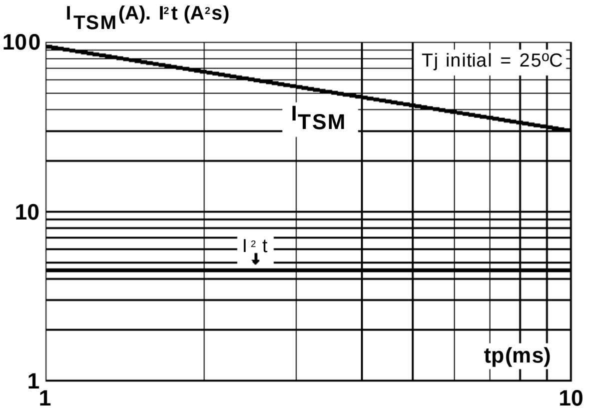
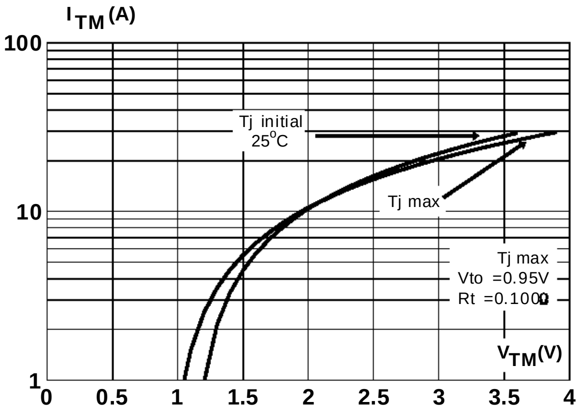
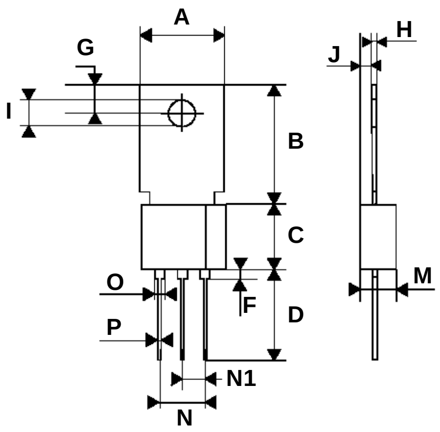


Fig.12 : On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA

TO202-1 (Plastic)

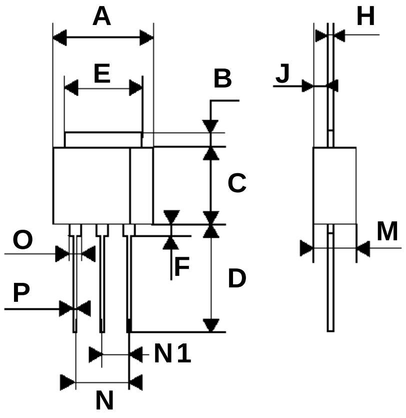


REF.	DIMENSIONS					
	Millimeters			Inches		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A			10.1			0.398
B	13.7			0.540		
C	7.3			0.287		
D	10.5			0.413		
F			1.5			0.059
G	3.2			0.126		
H	0.51			0.020		
I		3.16	3.20		0.124	0.126
J	1.5			0.059		
M	4.5			0.177		
N			5.3			0.209
N1	2.54			0.100		
O			1.4			0.055
P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

Marking : type number
Weight : 1.4 g

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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