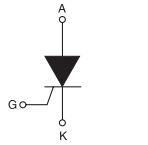
X04 Series

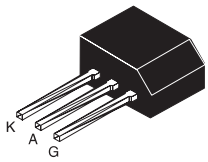
SENSITIVE

4A SCRs

MAIN FEATURES:

Symbol	Value	Unit
$I_{T(RMS)}$	4	A
V_{DRM}/V_{RRM}	600 and 800	V
I_{GT}	50 to 200	µA





TO202-3
(X04xxF)

DESCRIPTION

Thanks to highly sensitive triggering levels, the X04 SCR series is suitable for all applications where the available gate current is limited, such as capacitive discharge ignitions, motor control in kitchen aids, overvoltage crowbar protection in low power supplies...

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)		Tl = 60°C	4	A
			Tamb = 25°C	1.35	
$IT_{(AV)}$	Average on-state current (180° conduction angle)		Tl = 60°C	2.5	A
			Tamb = 25°C	0.9	
I_{TSM}	Non repetitive surge peak on-state current	tp = 8.3 ms	Tj = 25°C	33	A
		tp = 10 ms		30	
I^2t	I^2t Value for fusing	tp = 10 ms	Tj = 25°C	4.5	A^2S
dI/dt	Critical rate of rise of on-state current I_G = 2 x I_{GT} , tr ≤ 100ns	F = 60 Hz	Tj = 125°C	50	A/µs
I_{GM}	Peak gate current	tp = 20 µs	Tj = 125°C	1.2	A
$P_{G(AV)}$	Average gate power dissipation		Tj = 125°C	0.2	W
T_{stg} Tj	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	°C

ELECTRICAL CHARACTERISTICS (Tj = 25°C, unless otherwise specified)

Symbol	Test Conditions			X04xx		Unit
				02	05	
I_{GT}	V_D = 12 V R_L = 140 Ω		MIN.	_	20	µA
			MAX.	200	50	
V_{GT}			MAX.	0.8		V
V_{GD}	$V_D = V_{DRM}$ R_L = 3.3 kΩ R_{GK} = 1 kΩ	Tj = 125°C	MIN.	0.1		V
V_{RG}	I_{RG} = 10 µA		MIN.	8		V
I_H	I_T = 50mA R_{GK} = 1kΩ		MAX.	5		mA
I_L	I_G = 1mA R_{GK} = 1kΩ		MIN.	6		mA
dV/dt	V_D = 67% V_{DRM} R_{GK} = 1kΩ	Tj = 110°C	MIN.	10	15	V/µs
V_{TM}	I_{TM} = 8 A tp = 380 µs	Tj = 25°C	MAX.	1.8		V
V_{t0}	Threshold voltage	Tj = 125°C	MAX.	0.95		V
R_d	Dynamic resistance	Tj = 125°C	MAX.	100		mΩ
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$ R_{GK} = 1 kΩ	Tj = 25°C	MAX.	5		µA
		Tj = 125°C		1		mA

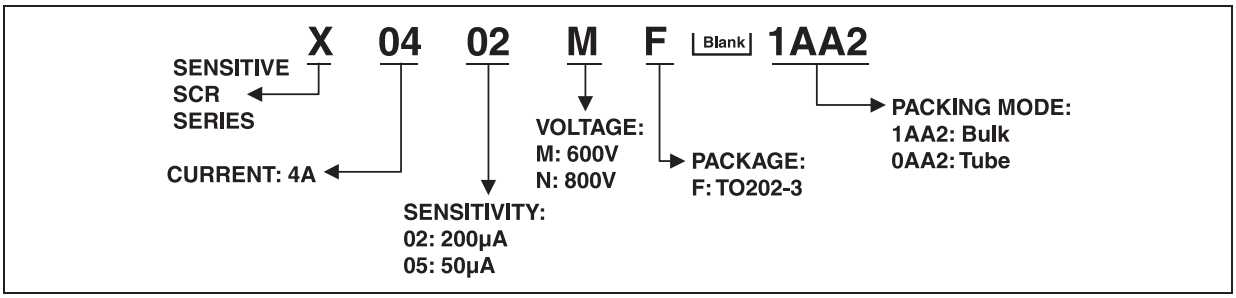
THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads (DC)	15	°C/W
$R_{th(j-a)}$	Junction to ambient (DC)	100	

PRODUCT SELECTOR

Part Number	Voltage		Sensitivity	Package
	600 V	800 V		
X0402MF	X		200 µA	TO202-3
X0402NF		X	200 µA	TO202-3
X0405MF	X		50 µA	TO202-3
X0405NF		X	50 µA	TO202-3

ORDERING INFORMATION



OTHER INFORMATION

Part Number	Marking	Weight	Base Quantity	Packing mode
X04xxyF 1AA2	X04xxyF	0.8 g	250	Bulk
X04xxyF 0AA2	X04xxyF	0.8 g	50	Tube

Note: xx = sensitivity, y = voltage

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

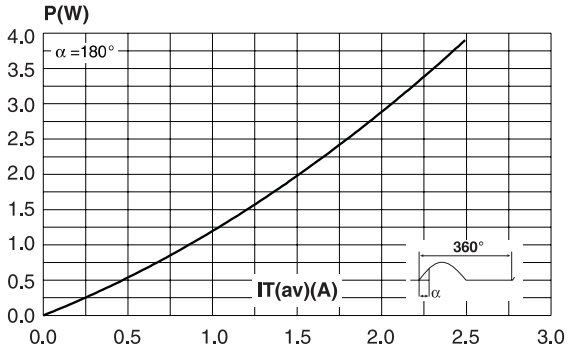


Fig. 2-1: Average and D.C. on-state current versus lead temperature.

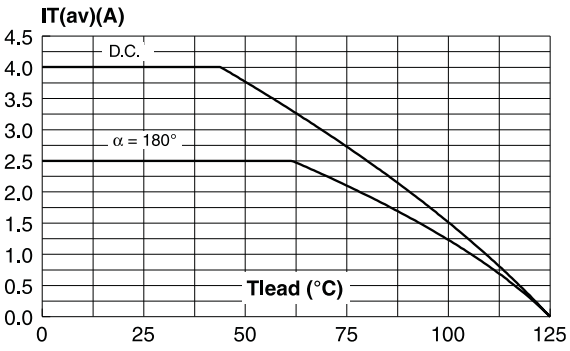


Fig. 2-2: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout).

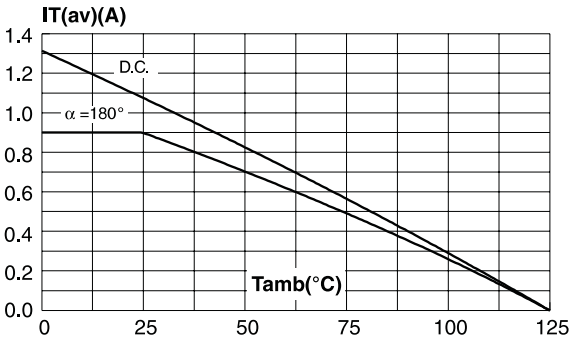


Fig. 3: Relative variation of thermal impedance junction to ambient versus pulse duration.

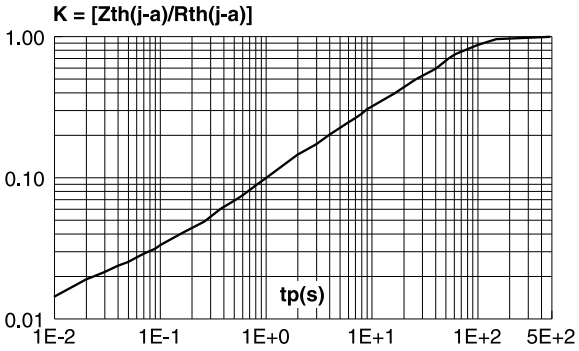


Fig. 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

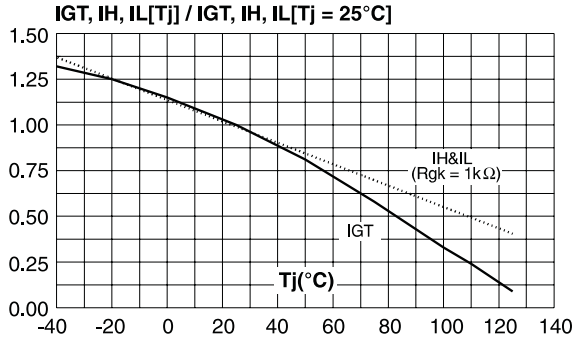


Fig. 5: Relative variation of holding current versus gate-cathode resistance (typical values).

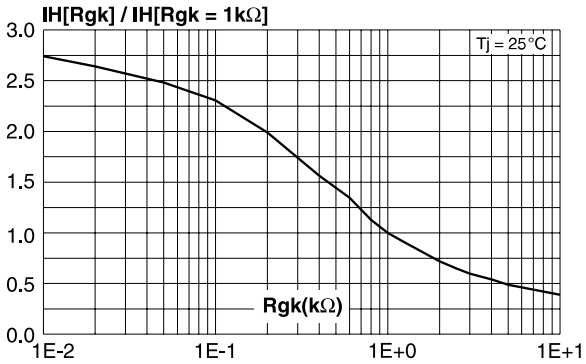


Fig. 6: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values).

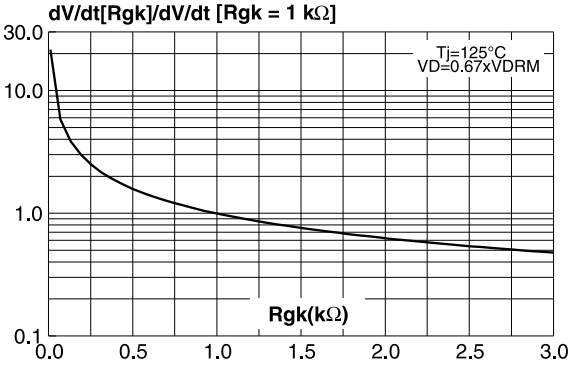


Fig. 7: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values).

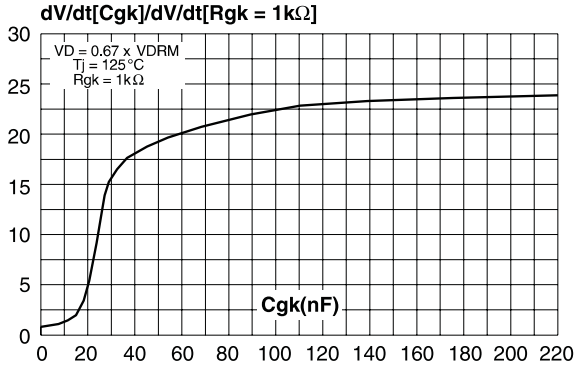


Fig. 8: Surge peak on-state current versus number of cycles.

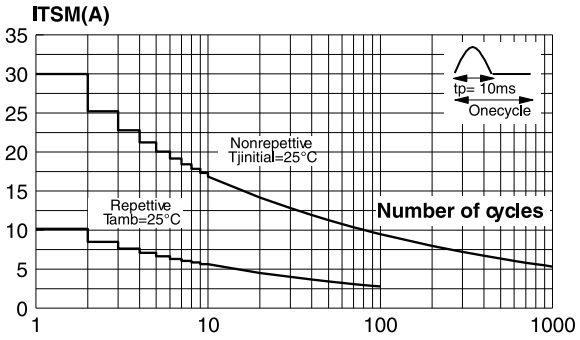


Fig. 9: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10 ms, and corresponding value of I²t.

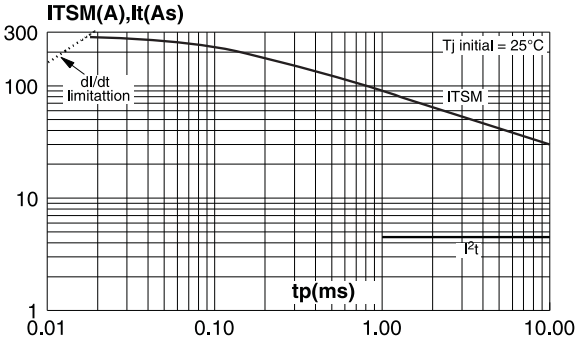
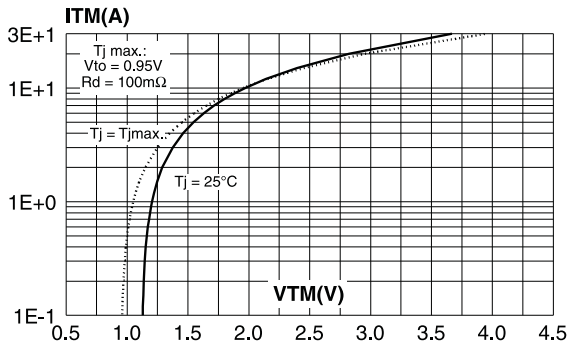
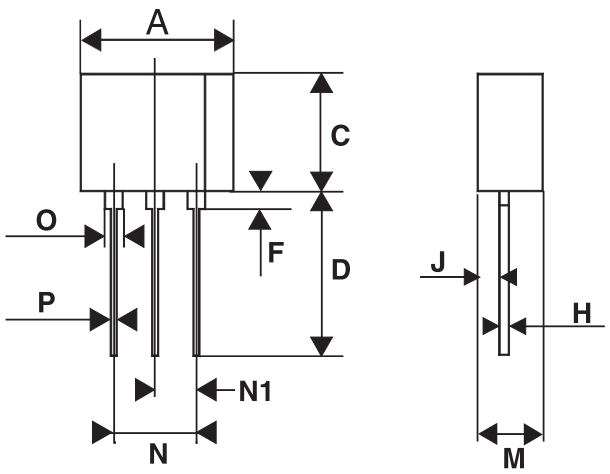


Fig. 10: On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA

TO202-3 (Plastic)



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			10.1			0.398
C		7.3			0.287	
D		10.5			0.413	
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