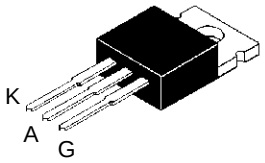
SGS-THOMSON MICROELECTRONICS

S0402xH

SENSITIVE GATE SCR

FEATURES

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



TO220
non-insulated
(Plastic)

DESCRIPTION

The S0402xH series of SCRs uses a high performance MESA 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)	Tc= 110°C	4	A
$I_{T(AV)}$	Mean on-state current (180° conduction angle)	Tc= 110°C	2.5	A
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25°C)	tp = 8.3 ms	55	A
		tp = 10 ms	50	
I^2t	I^2t Value for fusing	tp = 10 ms	12.5	A^2s
dI/dt	Critical rate of rise of on-state current I_G = 10 mA di_G/dt = 0.1 A/µs.		100	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} = 1KΩ	200	400	600	800	V

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
Rth(j-a)	Junction to ambient	60	°C/W
Rth(j-c)	Junction to case for DC	4	°C/W

GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$= 0.5 W P_{GM} = 5 W (tp = 20 µs) I_{GM} = 2 A (tp = 20 µs)

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions			Sensitivity	Unit
				02	
I_{GT}	V_D=12V (DC) R_L=140Ω	Tj= 25°C	MAX	200	µA
V_{GT}	V_D=12V (DC) R_L=140Ω	Tj= 25°C	MAX	1.5	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	TYP	0.5	µs
I_H	I_T= 50mA R_{GK} = 1 KΩ	Tj= 25°C	MAX	10	mA
I_L	I_G=1mA R_{GK} = 1 KΩ	Tj= 25°C	MAX	20	mA
V_{TM}	I_{TM}= 8A tp= 380µs	Tj= 25°C	MAX	1.6	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	500	µA
dV/dt	V_D=67%V_{DRM} R_{GK} = 1 KΩ	Tj= 110°C	TYP	10	V/µs
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	100	µs

ORDERING INFORMATION

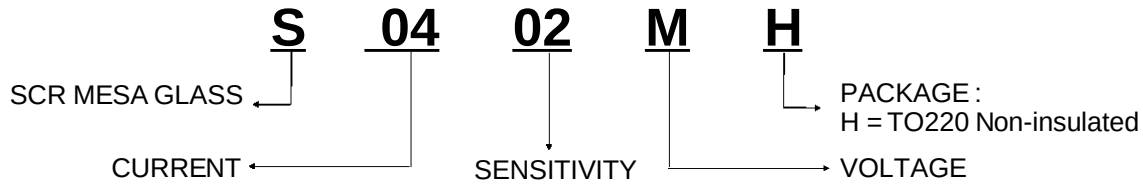


Fig.1 : Maximum average power dissipation versus average on-state current.

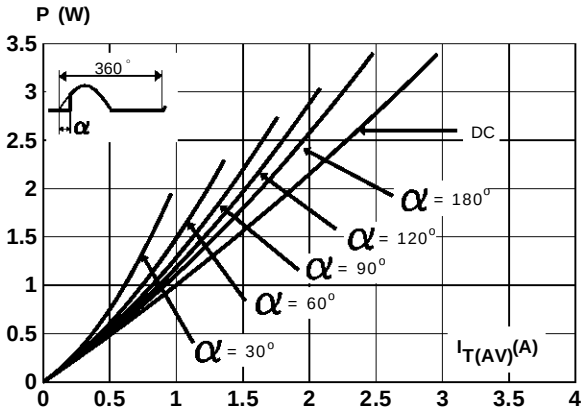


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact.

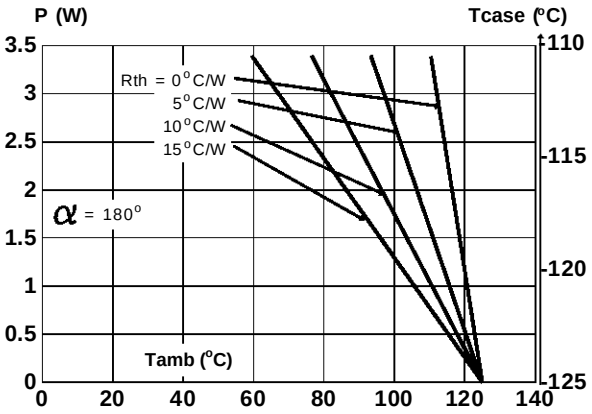


Fig.3 : Average on-state current versus case temperature.

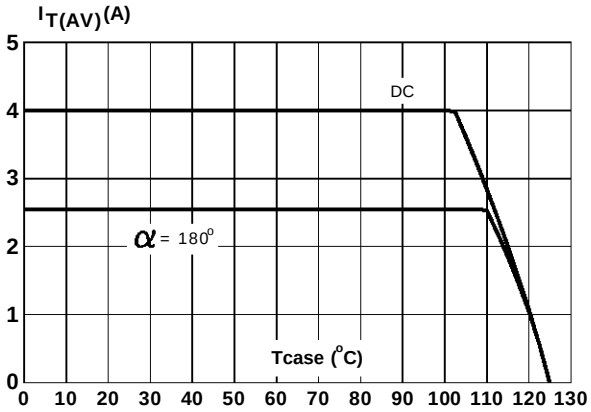


Fig.4 : Relative variation of thermal impedance versus pulse duration.

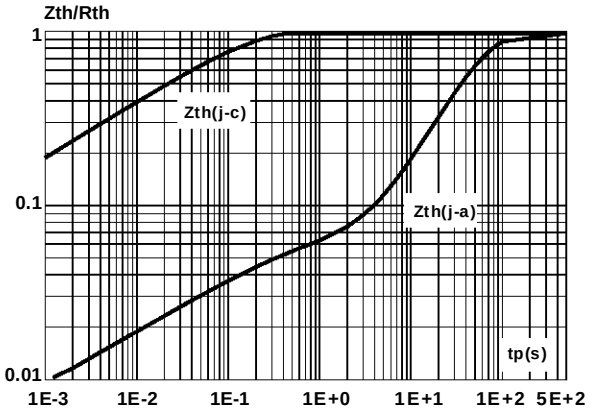


Fig.5 : Relative variation of gate trigger current and holding current versus junction temperature.

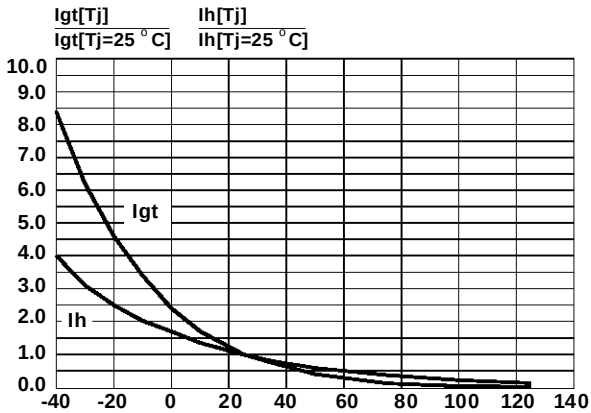


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.

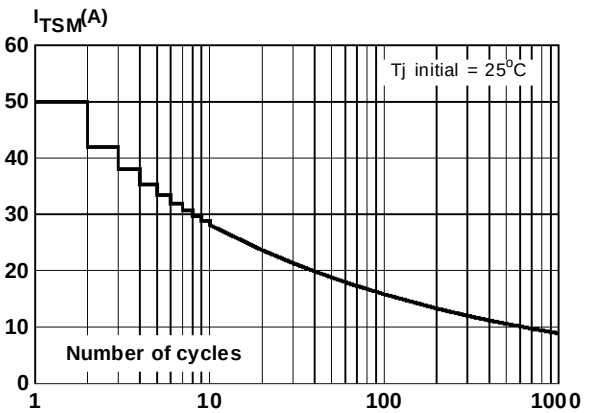


Fig.7 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : tp ≤ 10ms, and corresponding value of I^2t.

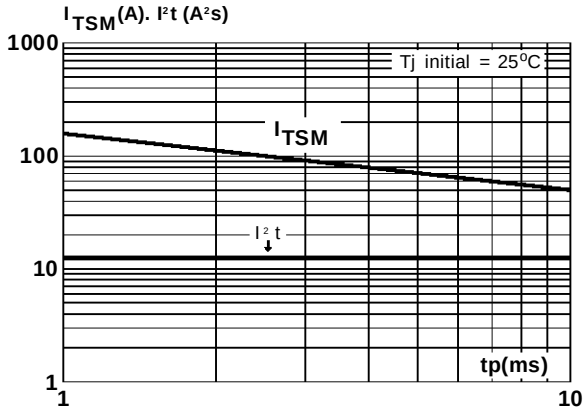
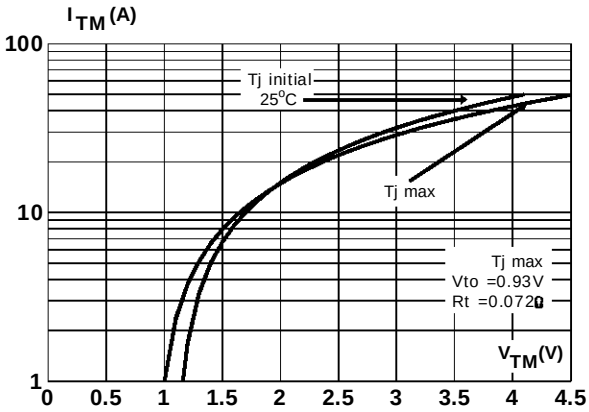
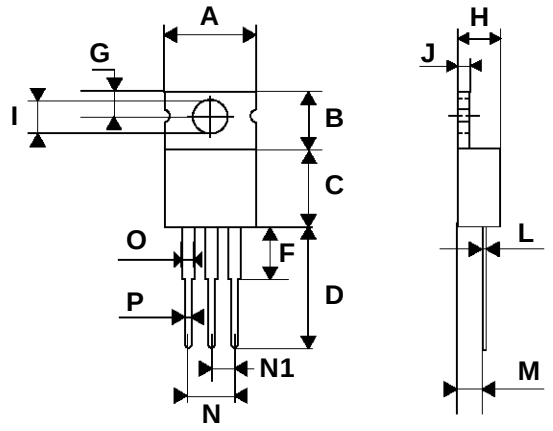


Fig.8 : On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA
TO220 Non-insulated (Plastic)



REF.	DIMENSIONS					
	Millimetres			Inches		
	Typ.	Min.	Max.	Typ.	Min.	Max.
A			10.3			0.406
B		6.3	6.5	0.248	0.256	
C			9.1			0.358
D		12.7			0.500	
F			4.2			0.165
G			3.0			0.118
H		4.5	4.7		0.177	0.185
I		3.53	3.66		0.139	0.144
J		1.2	1.3		0.047	0.051
L			0.9			0.035
M	2.7			0.106		
N			5.3			0.209
N1	2.54			0.100		
O		1.2	1.4		0.047	0.055
P			1.15			0.045

Marking : type number
Weight : 1.8 g