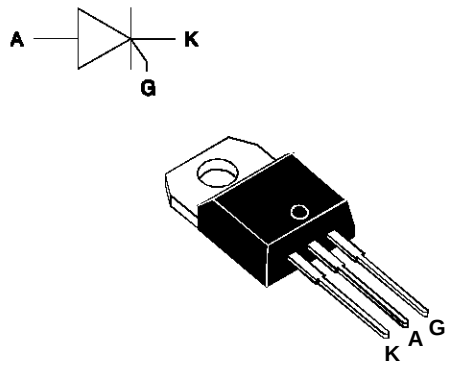
SGS-THOMSON MICROELECTRONICS

TYP 212 --->TYP 2012

SCR FOR OVERVOLTAGE PROTECTION

FEATURES

- HIGH SURGE CURRENT CAPABILITY
- HIGH dI/dt RATING
- HIGH STABILITY AND RELIABILITY



TO220AB
(Plastic)

DESCRIPTION

The TYP 212 ---> 1012 Family uses high performance glass passivated chips technology.
These Silicon Controlled Rectifiers are designed for overvoltage protection in crowbar circuits application.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle, single phase circuit)	Tc = 110 °C	12	A
$I_{T(AV)}$	Average on-state current (180° conduction angle, single phase circuit)	Tc = 110 °C	8	A
I_{TSM}	Non repetitive surge peak on-state current (Tj initial = 25°C)	tp = 8.3 ms	315	A
		tp = 10 ms	300	
I^2t	I^2t value	tp = 10 ms	450	A^2s
I_{TM}	Non repetitive surge peak on-state current (Tj initial = 25°C) Exponential pulse wave form	tp = 1 ms	750	A
dI/dt	Critical rate of rise of on-state current Gate supply : I_G = 100 mA di_G/dt = 1 A/µs		100	A/µs
Tstg Tj	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 125	°C °C
Tl	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		260	°C

Symbol	Parameter	TYP				Unit
		212	512	1012	2012	
V_{DRM} V_{RRM}	Repetitive peak off-state voltage Tj = 125 °C	25	50	100	200	V

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
Rth (j-a)	Junction to ambient	60	°C/W
Rth (j-c) DC	Junction to case for DC	1.3	°C/W

GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$ = 1W P_{GM} = 10W (tp = 20 µs) I_{FGM} = 4A (tp = 20 µs) V_{RGM} = 5 V.

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions			Value	Unit
I_{GT}	V_D=12V (DC) R_L=33Ω	Tj=25°C	MAX	30	mA
V_{GT}	V_D=12V (DC) R_L=33Ω	Tj=25°C	MAX	1.5	V
V_{GD}	V_D=V_{DRM} R_L=3.3kΩ	Tj= 125°C	MIN	0.2	V
tgt	V_D=V_{DRM} I_G = 200mA dI_G/dt = 1.5A/µs	Tj=25°C	TYP	1	µs
I_L	I_G= 1.2 I_{GT}	Tj=25°C	TYP	60	mA
I_H	I_T= 500mA gate open	Tj=25°C	MAX	50	mA
V_{TM}	ITM= 50A tp= 380µs	Tj=25°C	MAX	1.5	V
I_{DRM} I_{RRM}	V_{DRM} Rated V_{RRM} Rated	Tj=25°C	MAX	0.01	mA
		Tj= 125°C		2	
dV/dt	Linear slope up to V_D=67%V_{DRM} gate open	Tj= 125°C	MIN	200	V/µs
tq	V_D=67%V_{DRM} I_{TM}= 50A V_R= 25V dI_{TM}/dt=30 A/µs dV_D/dt= 50V/µs	Tj= 125°C	TYP	100	µs

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

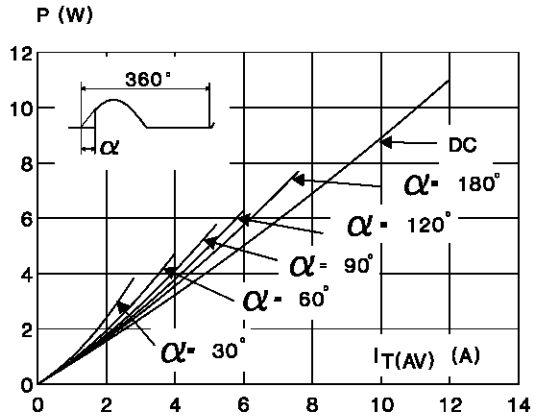


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact.

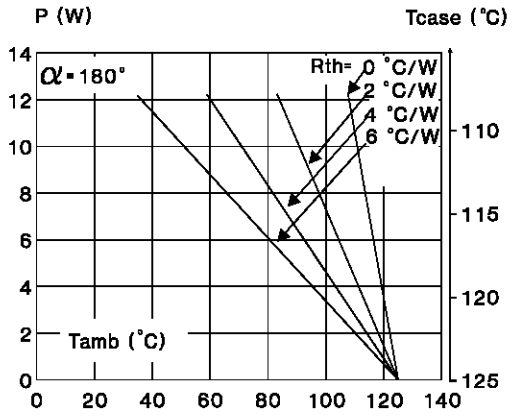


Fig.3 : Average on-state current versus case temperature.

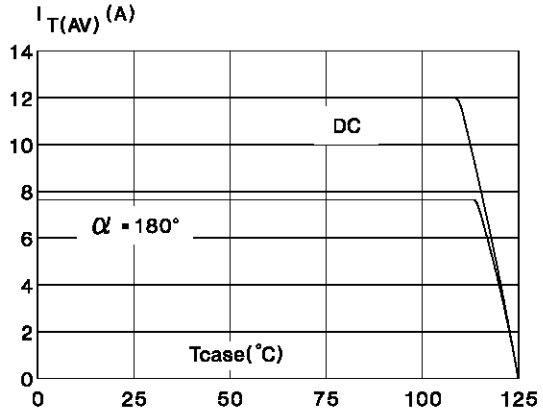


Fig.4 : Relative variation of thermal impedance versus pulse duration.

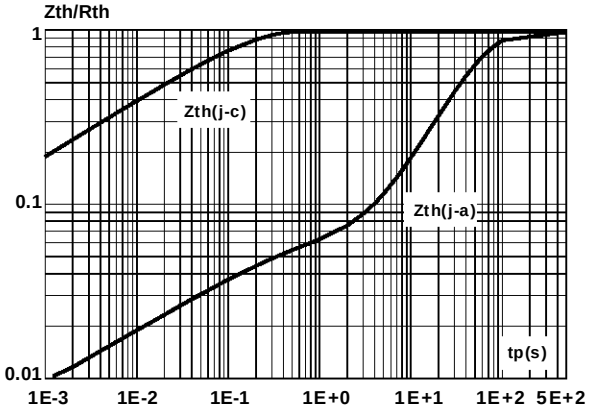


Fig.5 : Relative variation of gate trigger current versus junction temperature.

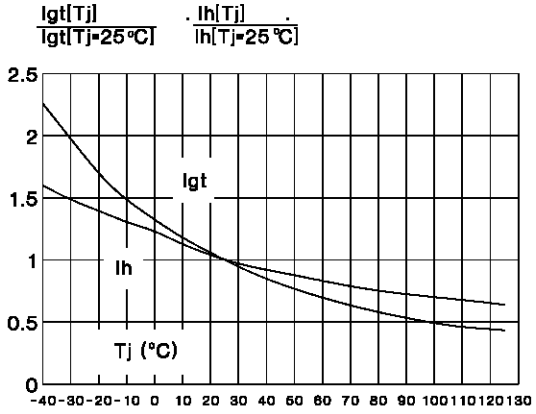


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.

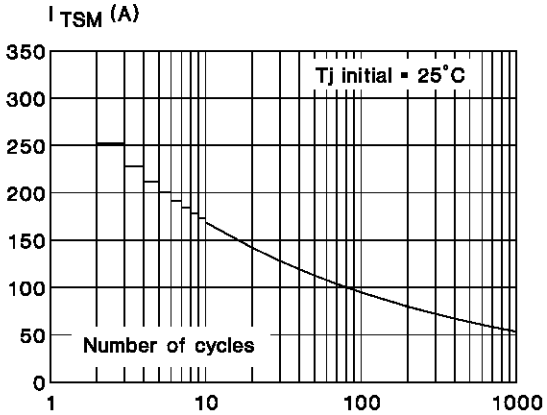


Fig.7 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10 ms, and corresponding value of I^2t.

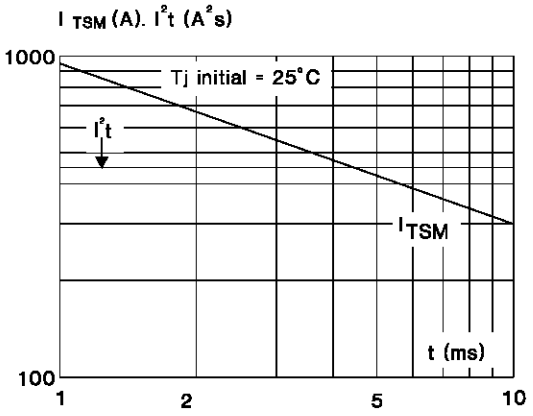


Fig.8 : On-state characteristics (maximum values).

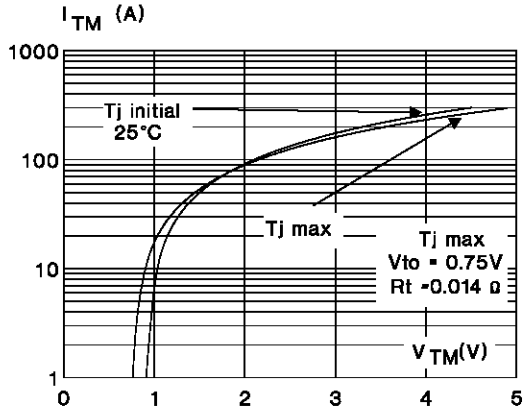


Fig.9 : Peak capacitor discharge current versus pulse width.

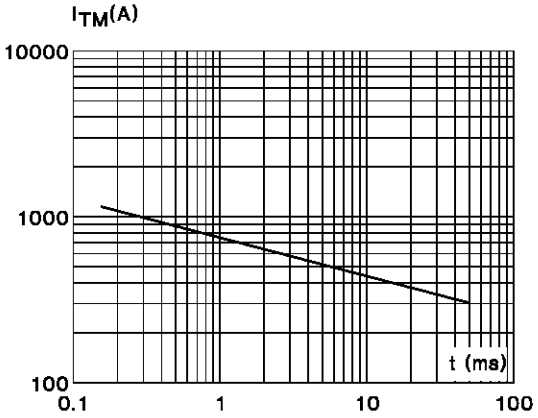
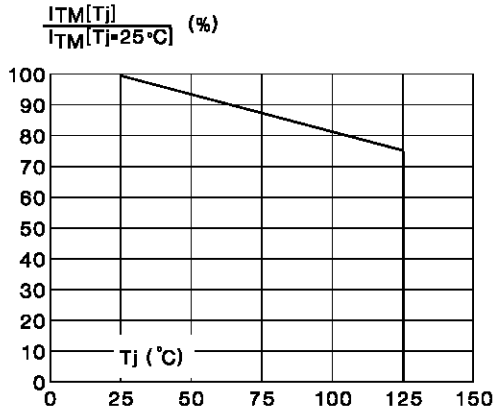
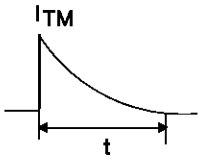


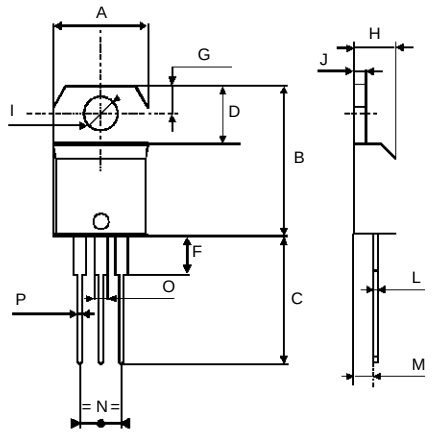
Fig.10 : Allowable peak capacitor discharge current versus initial junction temparature.





PACKAGE MECHANICAL DATA

TO220AB Plastic



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10.00	10.40	0.393	0.409
B	15.20	15.90	0.598	0.625
C	13.00	14.00	0.511	0.551
D	6.20	6.60	0.244	0.259
F	3.50	4.20	0.137	0.165
G	2.65	2.95	0.104	0.116
H	4.40	4.60	0.173	0.181
I	3.75	3.85	0.147	0.151
J	1.23	1.32	0.048	0.051
L	0.49	0.70	0.019	0.027
M	2.40	2.72	0.094	0.107
N	4.80	5.40	0.188	0.212
O	1.14	1.70	0.044	0.066
P	0.61	0.88	0.024	0.034

Cooling method : C
Marking : type number
Weight : 2.3 g
Recommended torque value : 0.8 m.N.
Maximum torque value : 1 m.N.