

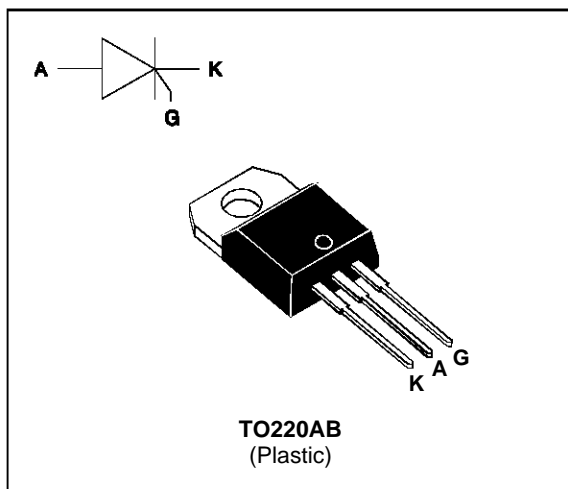
## SCR FOR OVERVOLTAGE PROTECTION

### FEATURES

- HIGH SURGE CURRENT CAPABILITY
- HIGH  $di/dt$  RATING
- HIGH STABILITY AND RELIABILITY

### 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)	$T_c = 110\text{ °C}$ 12	A
$I_{T(AV)}$	Average on-state current (180° conduction angle, single phase circuit)	$T_c = 110\text{ °C}$ 8	A
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = 25°C )	$t_p = 8.3\text{ ms}$ 315	A
		$t_p = 10\text{ ms}$ 300	
$I^2t$	$I^2t$ value	$t_p = 10\text{ ms}$ 450	$A^2s$
$I_{TM}$	Non repetitive surge peak on-state current ( $T_j$ initial = 25°C ) Exponential pulse wave form	$t_p = 1\text{ ms}$ 750	A
$di/dt$	Critical rate of rise of on-state current Gate supply : $I_G = 100\text{ mA}$ $di_G/dt = 1\text{ A}/\mu s$	100	$A/\mu s$
$T_{stg}$ $T_j$	Storage and operating junction temperature range	- 40 to + 150 - 40 to + 125	$^{\circ}C$ $^{\circ}C$
$T_l$	Maximum lead temperature for soldering during 10 s at 4.5 mm from case	260	$^{\circ}C$

Symbol	Parameter	TYP				Unit
		212	512	1012	2012	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125\text{ °C}$	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

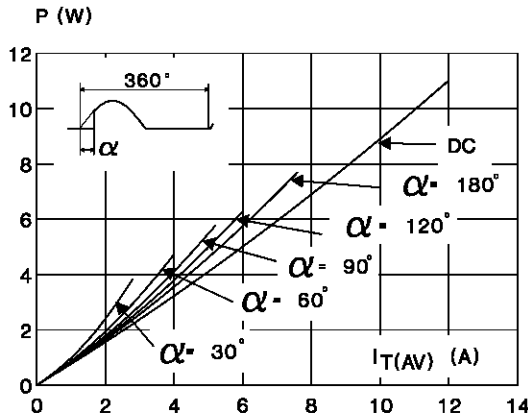
**GATE CHARACTERISTICS** (maximum values)

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

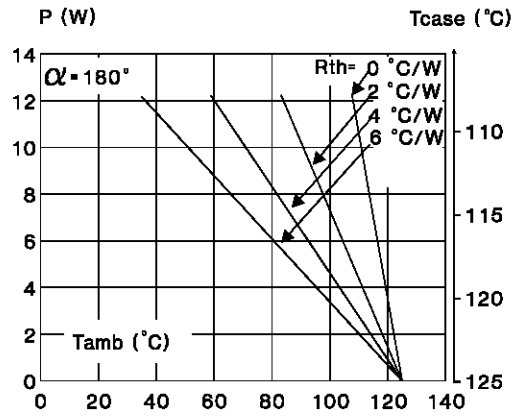
**ELECTRICAL CHARACTERISTICS**

Symbol	Test Conditions	Value	Unit
$I_{GT}$	$V_D=12V$ (DC) $R_L=33\Omega$ $T_j=25^\circ C$ MAX	30	mA
$V_{GT}$	$V_D=12V$ (DC) $R_L=33\Omega$ $T_j=25^\circ C$ MAX	1.5	V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3k\Omega$ $T_j=125^\circ C$ MIN	0.2	V
tgt	$V_D=V_{DRM}$ $I_G = 200mA$ $di_G/dt = 1.5A/\mu s$ $T_j=25^\circ C$ TYP	1	μs
$I_L$	$I_G = 1.2 I_{GT}$ $T_j=25^\circ C$ TYP	60	mA
$I_H$	$I_T = 500mA$ gate open $T_j=25^\circ C$ MAX	50	mA
$V_{TM}$	$I_{TM} = 50A$ tp= 380μs $T_j=25^\circ C$ MAX	1.5	V
$I_{DRM}$ $I_{RRM}$	$V_{DRM}$ Rated $V_{RRM}$ Rated $T_j=25^\circ C$ MAX	0.01	mA
	$T_j=125^\circ C$	2	
dV/dt	Linear slope up to $V_D=67\%V_{DRM}$ gate open $T_j=125^\circ C$ MIN	200	V/μs
tq	$V_D=67\%V_{DRM}$ $I_{TM} = 50A$ $V_R = 25V$ $di_{TM}/dt=30 A/\mu s$ $dV_D/dt= 50V/\mu s$ $T_j=125^\circ C$ TYP	100	μs

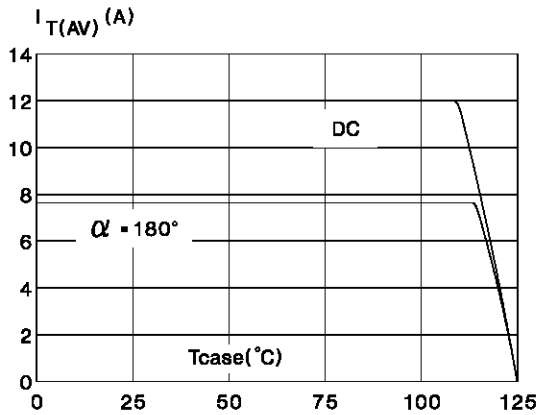
**Fig.1** : Maximum average power dissipation versus average on-state current.



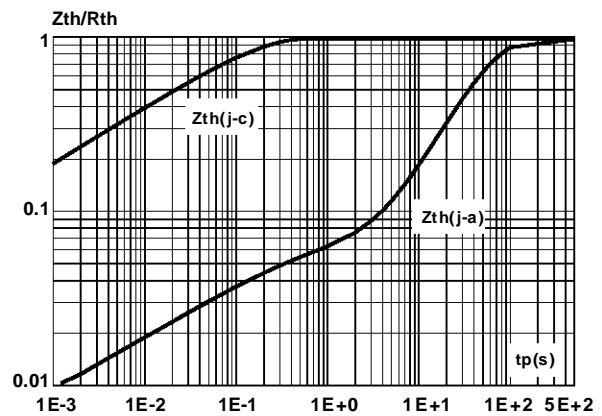
**Fig.2** : Correlation between maximum average power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact.



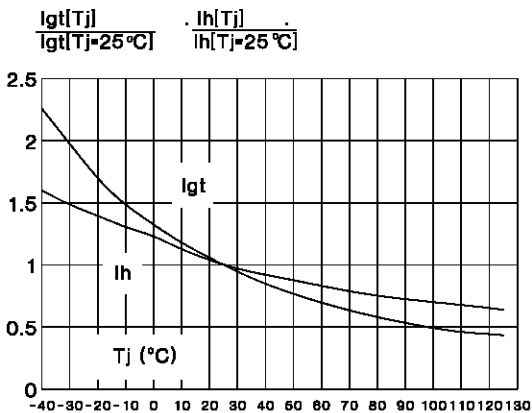
**Fig.3** : Average on-state current versus case temperature.



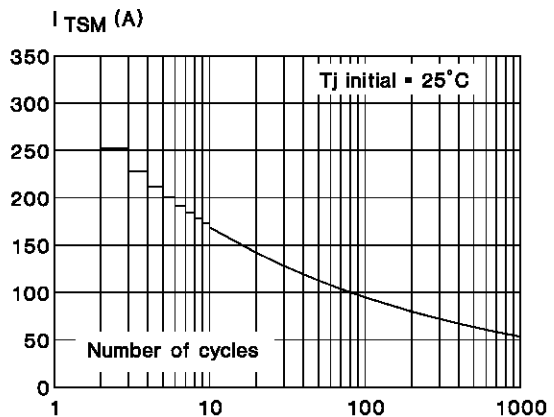
**Fig.4** : Relative variation of thermal impedance versus pulse duration.



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

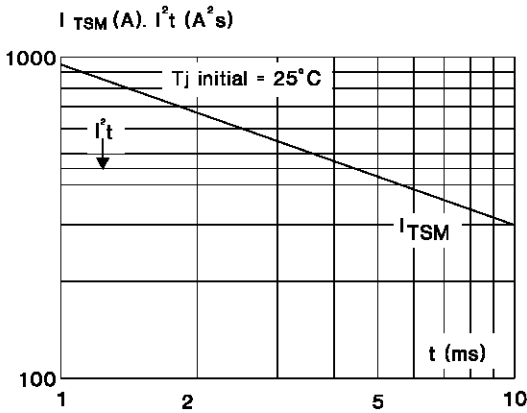


**Fig.6** : Non repetitive surge peak on-state current versus number of cycles.

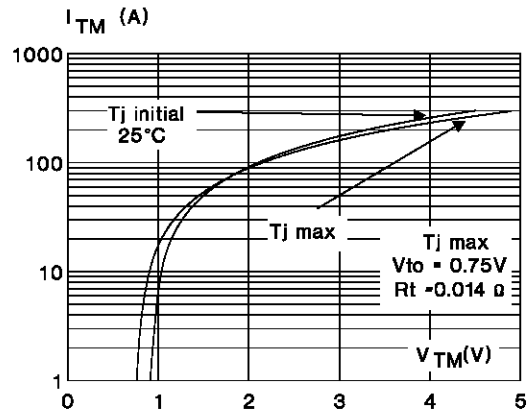


# TYP 212 ---> TYP 2012

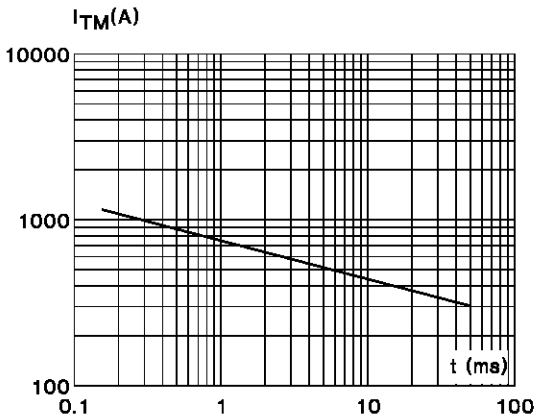
**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10$  ms, and corresponding value of  $I^2t$ .



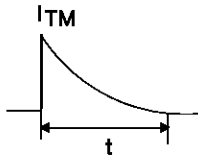
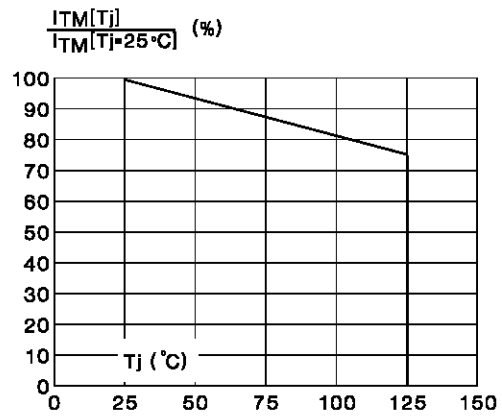
**Fig.8 :** On-state characteristics (maximum values).



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

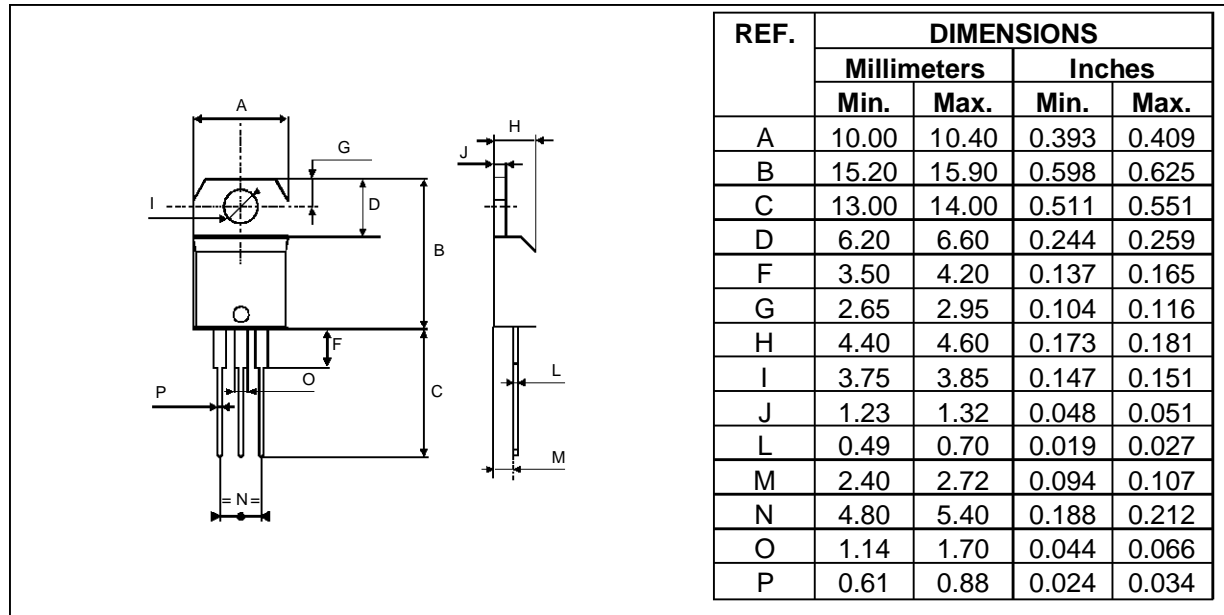


**Fig.10 :** Allowable peak capacitor discharge current versus initial junction temperature.



**PACKAGE MECHANICAL DATA**

TO220AB Plastic



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

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