

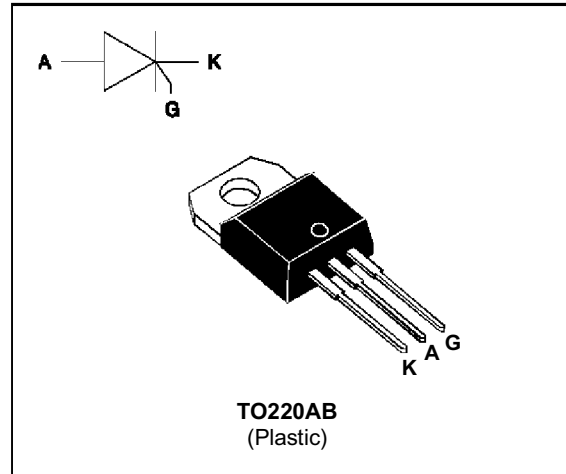
SCR FOR OVERVOLTAGE PROTECTION

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 <sup>2</sup> s
$I_{TM}$	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 : $I_G = 100\text{ mA}$ $di_G/dt = 1\text{ A}/\mu\text{s}$		100	A/ $\mu\text{s}$
$T_{stg}$ $T_j$	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 125	°C °C
$T_l$	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 $T_j = 125\text{ °C}$	25	50	100	200	V

## TYP 212 ---> TYP 2012

### 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

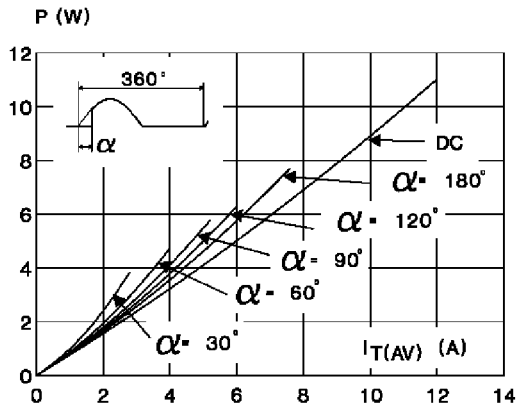
### GATE CHARACTERISTICS (maximum values)

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

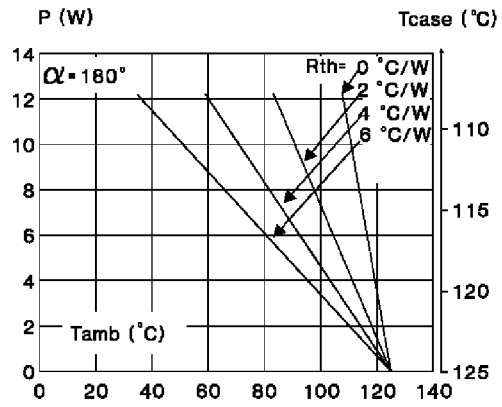
### ELECTRICAL CHARACTERISTICS

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 $\mu s$
$I_L$	$I_G = 1.2 I_{GT}$	$T_j=25^\circ C$ TYP	60 mA
$I_H$	$I_T = 500mA$ gate open	$T_j=25^\circ C$ MAX	50 mA
$V_{TM}$	$I_{TM} = 50A$ tp = 380 $\mu s$	$T_j=25^\circ C$ MAX	1.5 V
$I_{DRM}$ $I_{RRM}$	$V_{DRM}$ Rated $V_{RRM}$ Rated	$T_j=25^\circ C$ MAX $T_j=125^\circ C$	0.01 mA 2
dV/dt	Linear slope up to $V_D=67\%V_{DRM}$ gate open	$T_j=125^\circ C$ MIN	200 V/ $\mu s$
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 $\mu s$

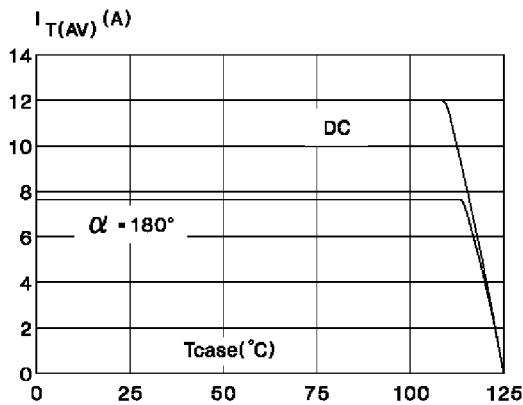
**Fig.1 :** Maximum average power dissipation versus average on-state current.



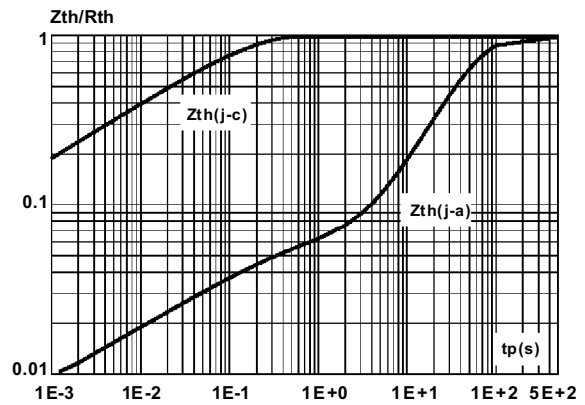
**Fig.2 :** Correlation between maximum average power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact.



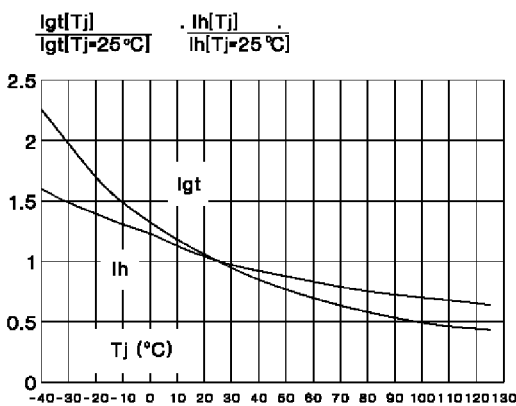
**Fig.3 :** Average on-state current versus case temperature.



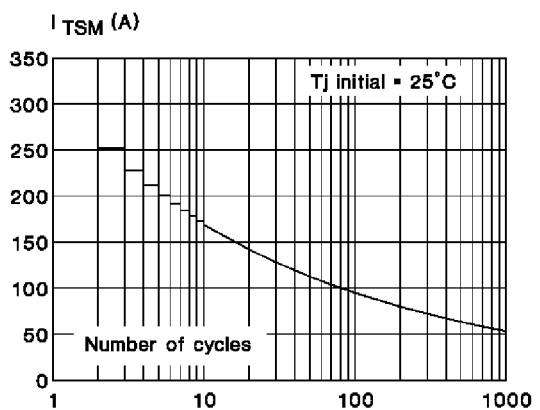
**Fig.4 :** Relative variation of thermal impedance versus pulse duration.



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

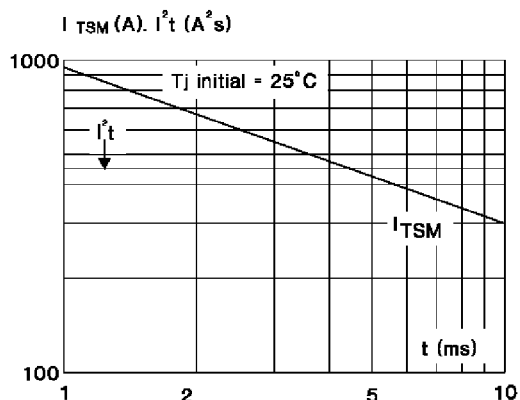


**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

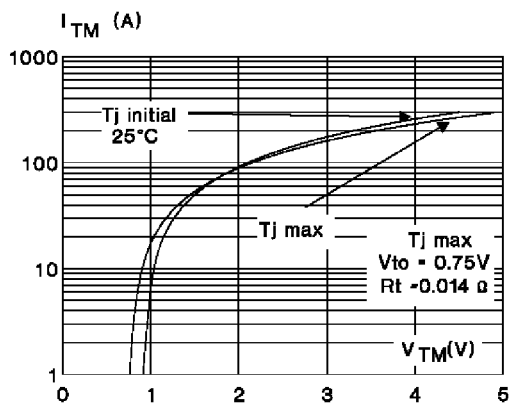


**TYP 212 ---> TYP 2012**

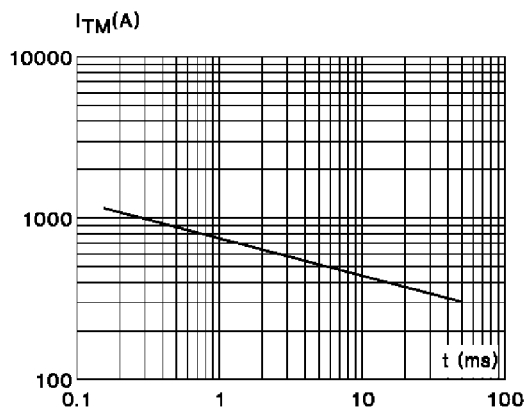
**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10$  ms, and corresponding value of  $I^2t$ .



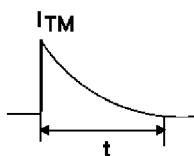
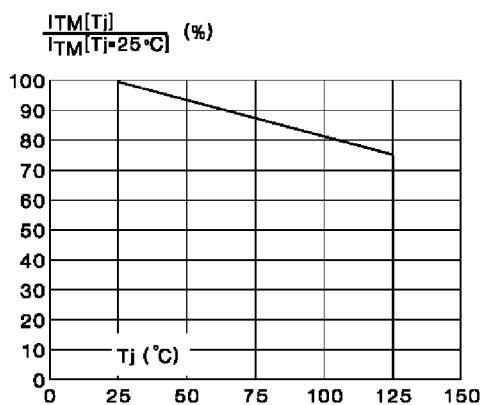
**Fig.8 :** On-state characteristics (maximum values).



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

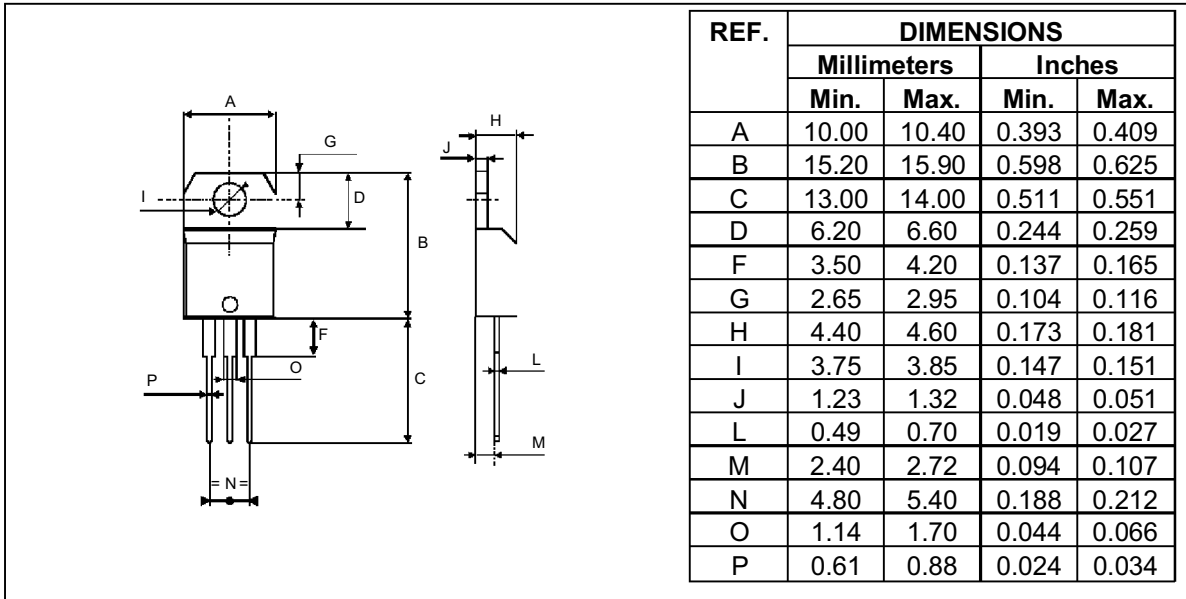


**Fig.10 :** Allowable peak capacitor discharge current versus initial junction temperature.



**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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