

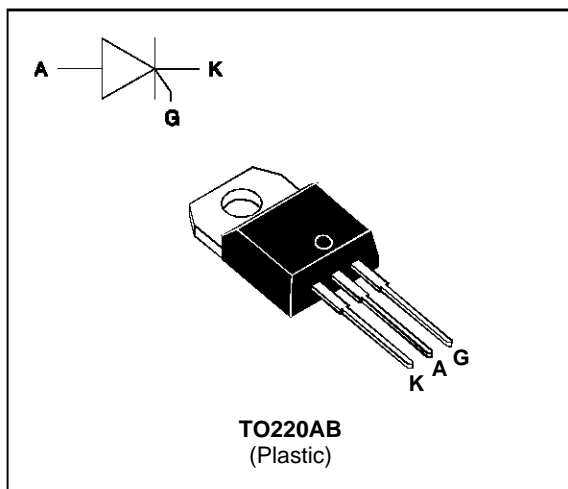
SCR FOR OVERVOLTAGE PROTECTION

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
		$t_p = 10\text{ ms}$	300
I^2t	I^2t value	$t_p = 10\text{ ms}$ 450	A ² 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/ μs
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

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.

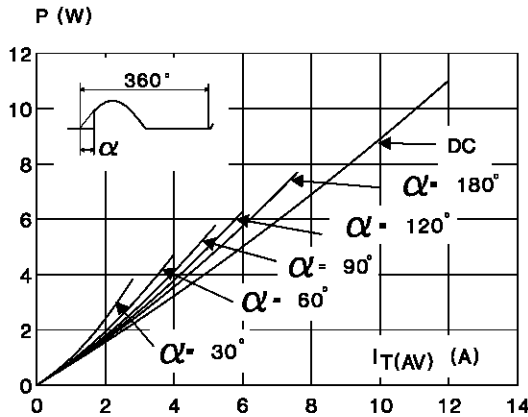


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact.

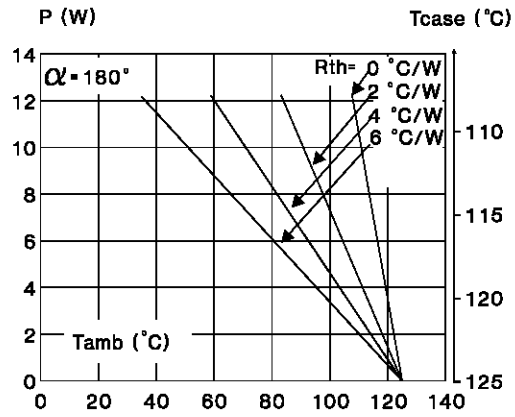


Fig.3 : Average on-state current versus case temperature.

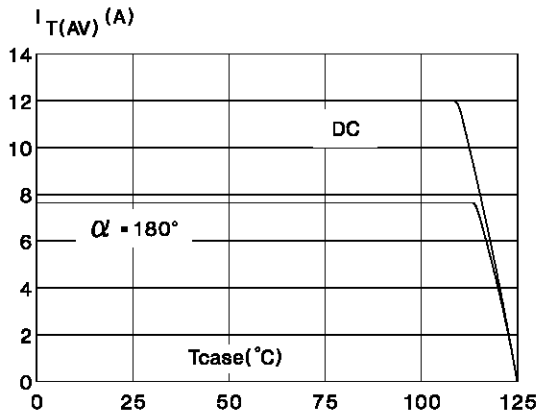


Fig.4 : Relative variation of thermal impedance versus pulse duration.

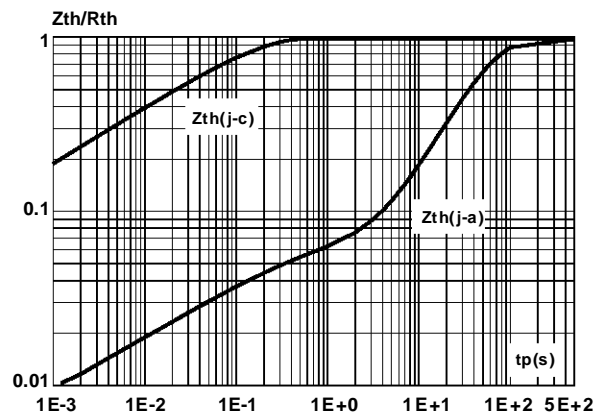


Fig.5 : Relative variation of gate trigger current versus junction temperature.

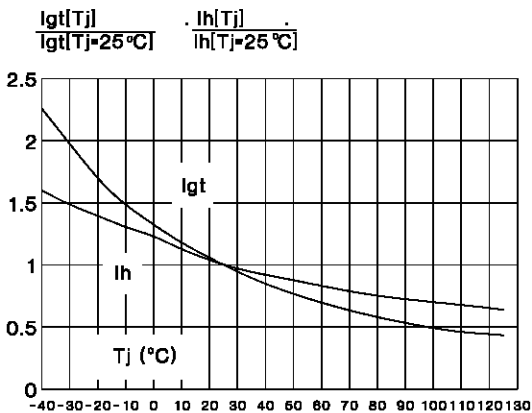
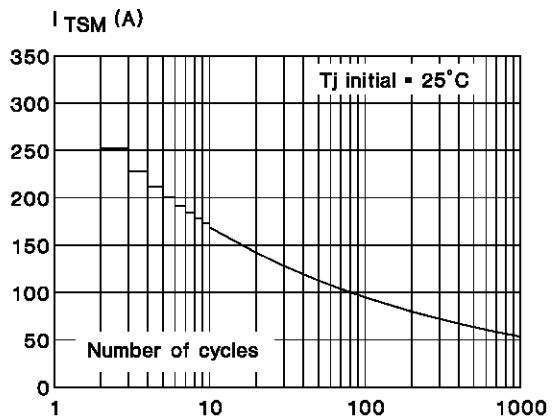


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.



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 .

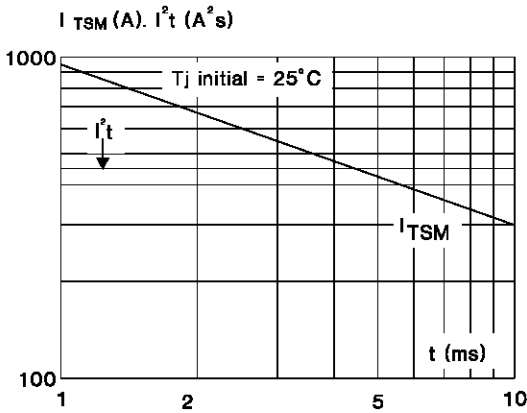


Fig.8 : On-state characteristics (maximum values).

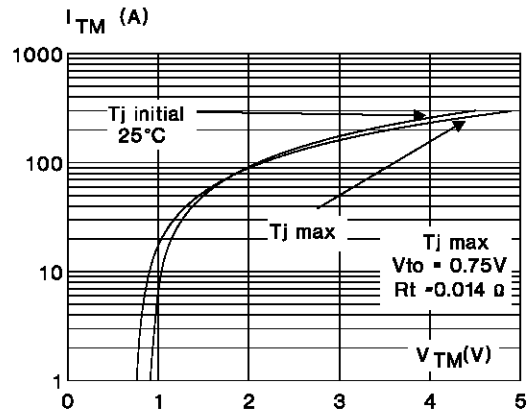


Fig.9 : Peak capacitor discharge current versus pulse width.

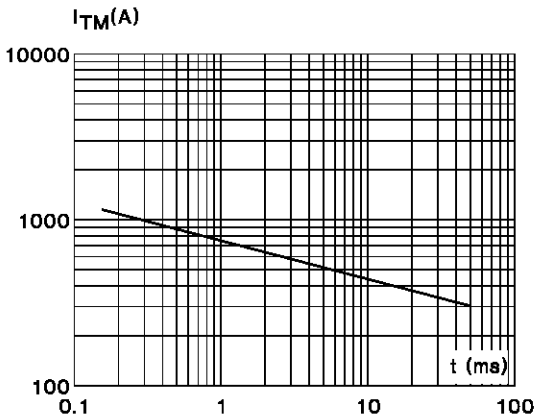
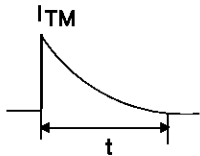
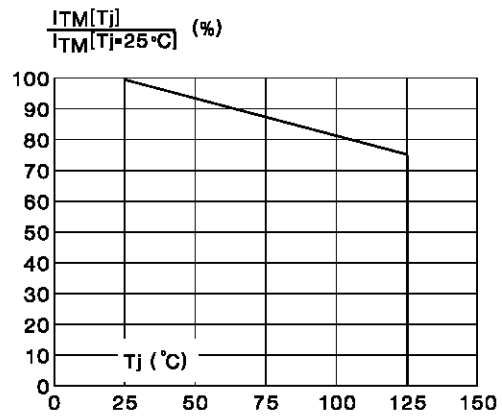
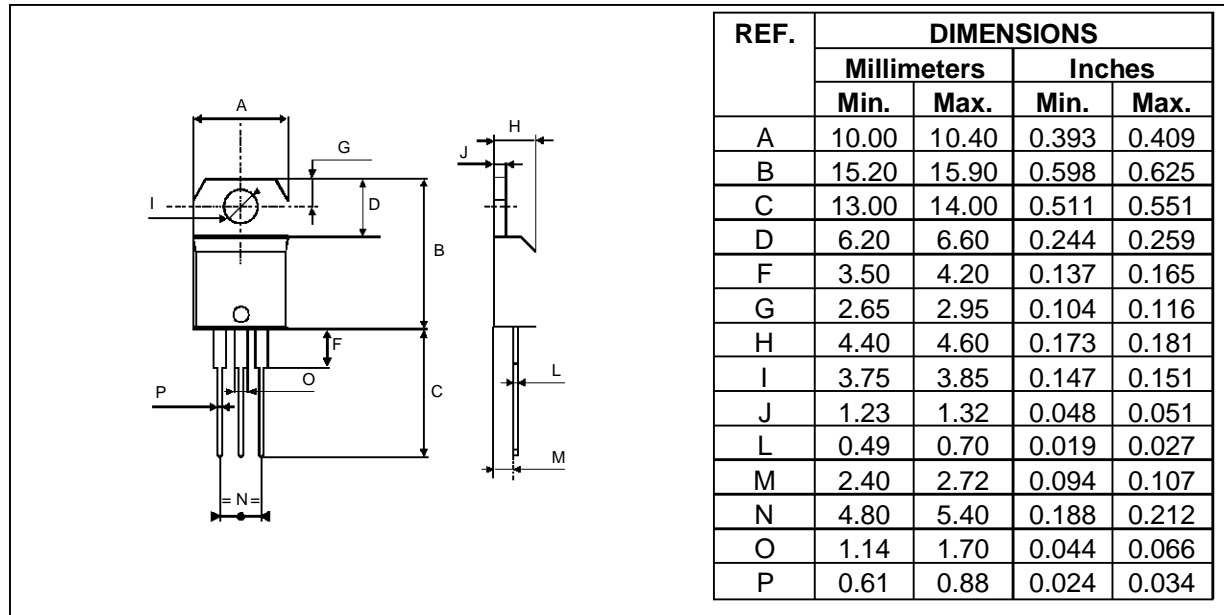


Fig.10 : Allowable peak capacitor discharge current versus initial junction temperature.



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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