

## DESCRIPTION:

The MAC223A8X SCR series with the parallel resistor between Gate and Cathode are especially recommended for use on straight hair, igniter, anion generator, etc.



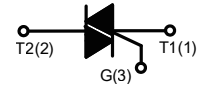
TO-3P



TO-220F



TO-220A



## MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	20	A
$V_{DRM}/V_{RRM}$	600/800/1200	V

## ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		$T_{stg}$	-40-150	°C
Operating junction temperature range		$T_j$	-40-125	°C
Repetitive peak off-state voltage ( $T_j=25^{\circ}C$ )		$V_{DRM}$	600/800/1200	V
Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )		$V_{RRM}$	600/800/1200	V
Non repetitive surge peak Off-state voltage		$V_{DSM}$	$V_{DRM} + 100$	V
Non repetitive peak reverse voltage		$V_{RSM}$	$V_{RRM} + 100$	V
RMS on-state current	TO-220A(Ins) ( $T_C=70^{\circ}C$ )	$I_{T(RMS)}$	20	A
	TO-220A(Non-Ins) ( $T_C=90^{\circ}C$ )			
	TO-220F(Ins) ( $T_C=65^{\circ}C$ )			
	TO-3P(Ins) ( $T_C=105^{\circ}C$ )			

Non repetitive surge peak on-state current (full cycle, F=50Hz)	$I_{TSM}$	200	A
$I^2t$ value for fusing ( $t_p=10ms$ )	$I^2t$	200	$A^2s$
Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ )	$di/dt$	100	$A/\mu s$
Peak gate current	$I_{GM}$	4	A
Average gate power dissipation	$P_{G(AV)}$	1	W
Peak gate power	$P_{GM}$	10	W

**ELECTRICAL CHARACTERISTICS** ( $T_j=25^\circ C$  unless otherwise specified)

## 3 Quadrants

Symbol	Test Condition	Quadrant		Value		Unit
				BW	CW	
$I_{GT}$	$V_D=12V$ $R_L=33\Omega$	I - II -III	MAX	50	35	mA
$V_{GT}$		I - II -III	MAX	1.3		V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=125^\circ C$ $R_L=3.3K\Omega$	I - II -III	MIN	0.2		V
$I_L$	$I_G=1.2I_{GT}$	I -III	MAX	70	60	mA
		II		90	70	
$I_H$	$I_T=100mA$		MAX	60	50	mA
$dV/dt$	$V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ C$		MIN	1000	500	$V/\mu s$

## 4 Quadrants

Symbol	Test Condition	Quadrant		Value	Unit
$I_{GT}$	$V_D=12V$ $R_L=33\Omega$	I - II -III	MAX	50	mA
		IV		70	
$V_{GT}$		ALL	MAX	1.3	V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=125^\circ C$ $R_L=3.3K\Omega$	ALL	MIN	0.2	V
$I_L$	$I_G=1.2I_{GT}$	I -III-IV	MAX	70	mA
		II		90	
$I_H$	$I_T=100mA$		MAX	60	mA
$dV/dt$	$V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ C$		MIN	500	$V/\mu s$

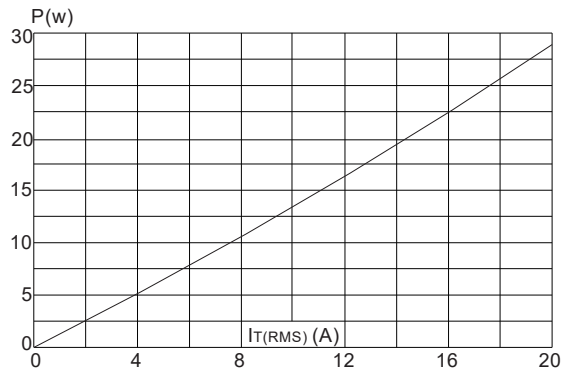
## STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX)	Unit
$V_{TM}$	$I_{TM}=28A$ $t_p=380\mu s$	$T_j=25^{\circ}C$	1.5	V
$I_{DRM}$	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^{\circ}C$	5	$\mu A$
$I_{RRM}$		$T_j=125^{\circ}C$	2.5	mA

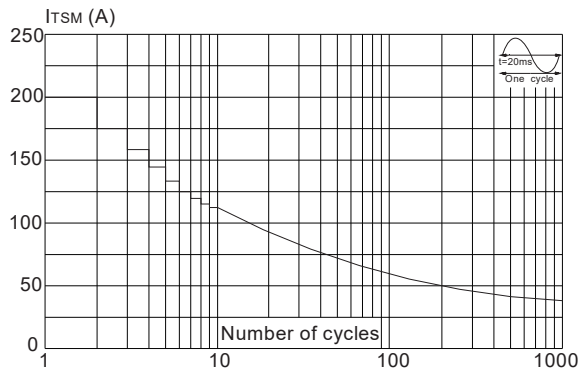
## THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220A(Ins)	1.9	$^{\circ}C/W$
		TO-220A(Non-Ins) 1.1		
		TO-220F(Ins)	2.1	
		TO-3P	0.7	

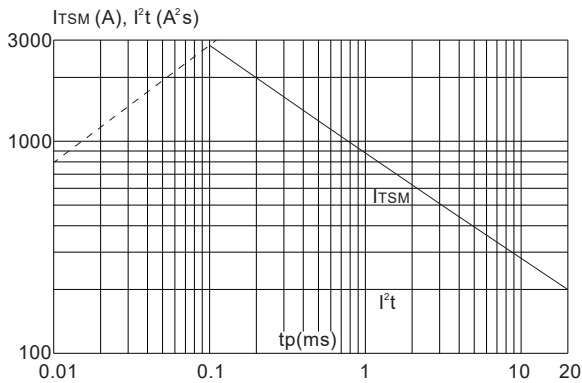
**FIG.1** Maximum power dissipation versus RMS on-state current



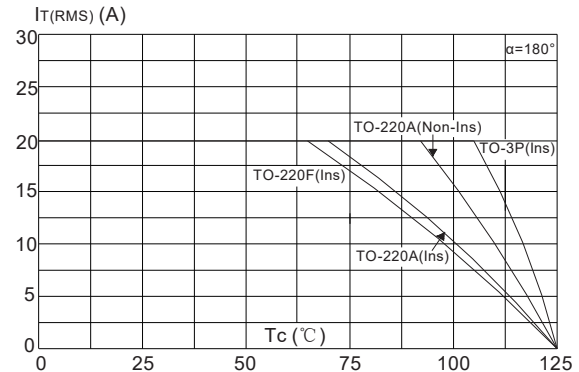
**FIG.3:** Surge peak on-state current versus number of cycles



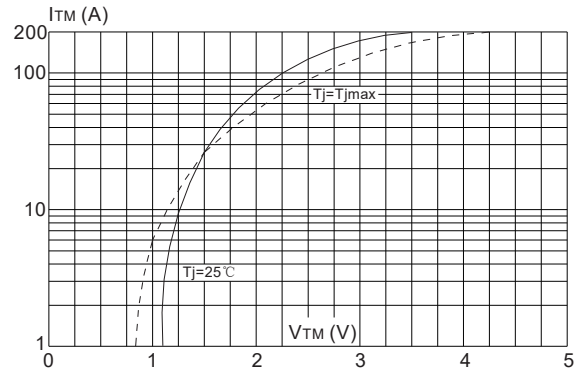
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 100\text{A}/\mu\text{s}$ )



**FIG.2:** RMS on-state current versus case temperature



**FIG.4:** On-state characteristics (maximum values)



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

