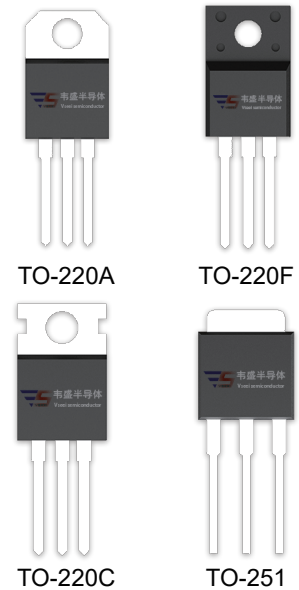


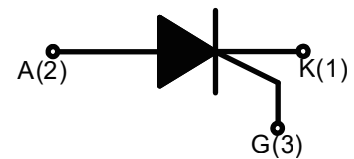
## DESCRIPTION:

With high ability to withstand the shock loading of large current, BT151X-500R series of silicon controlled rectifiers provide high dv/dt rate with strong resistance to electromagnetic interference. They are especially recommended for use on solid state relay, motorcycle, power charger, T-tools etc.



## MAIN FEATURES

Symbol	Value	Symbol
$V_{DRM}/V_{RRM}$	650/800	V
$I_{T(RMS)}$	12	A
$I_{GT}$	$\leq 15$	mA



## ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		$T_{stg}$	-40 - 150	$^{\circ}\text{C}$
Operating junction temperature range		$T_j$	-40 - 150	$^{\circ}\text{C}$
Repetitive peak off-state voltage ( $T_j=25^{\circ}\text{C}$ )		$V_{DRM}$	650/800	V
Repetitive peak reverse voltage ( $T_j=25^{\circ}\text{C}$ )		$V_{RRM}$	650/800	V
RMS on-state current	TO-251/ TO-220C/ TO-220A (Non-Ins) ( $T_C=130^{\circ}\text{C}$ )	$I_{T(RMS)}$	12	A
	TO-220A (Ins)/ TO-220F (Ins) ( $T_C=125^{\circ}\text{C}$ )			
Non repetitive surge peak on-state current ( $F=50\text{Hz}$ $t_p=10\text{ms}$ )		$I_{TSM}$	120	A

Non repetitive surge peak on-state current (F=60Hz tp=8.3ms)	$I_{TSM}$	132	A
$I^2t$ value for fusing (tp=10ms)	$I^2t$	72	A <sup>2</sup> s
Repetitive rate of rise of on-state current ( $I_G=2 \times I_{GT}$ )	$dI_T/dt$	50	A/ $\mu$ s
Peak gate current	$I_{GM}$	2	A
Peak gate power	$P_{GM}$	5	W
Average gate power dissipation	$P_{G(AV)}$	0.5	W

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

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
$I_{GT}$	$V_D=12V$ $R_L=33\Omega$	-	4	15	mA
$V_{GT}$		-	0.75	1.5	V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=150^\circ\text{C}$ $R_L=3.3K\Omega$	0.2	-	-	V
$I_L$	$I_G=1.2I_{GT}$	-	12	40	mA
$I_H$	$I_T=500\text{mA}$	-	12	30	mA
$dV/dt$	$V_D=540V$ Gate Open $T_j=150^\circ\text{C}$	50	-	-	V/ $\mu$ s
$dV/dt$	$V_D=436V$ Gate Open $T_j=150^\circ\text{C}$	80	-	-	V/ $\mu$ s
$t_{on}$	$I_{GT}=20\text{mA}$ $I_A=100\text{mA}$ $I_R=10\text{mA}$ $T_j=25^\circ\text{C}$	-	2	-	$\mu$ s
$t_{off}$		-	30	-	$\mu$ s
$R_d$	Dynamic resistance $T_j=125^\circ\text{C}$	-	-	35	m $\Omega$

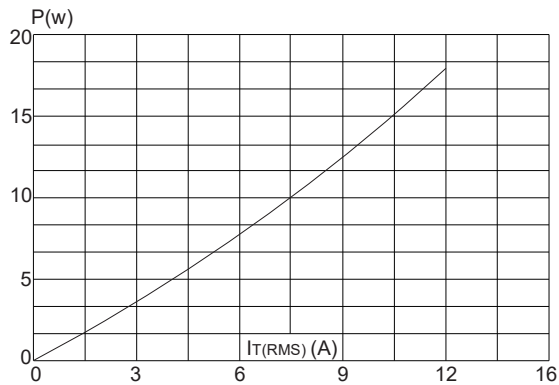
**STATIC CHARACTERISTICS**

Symbol	Parameter		Value(MAX)	Unit
$V_{TM}$	$I_{TM}=23A$ tp=380 $\mu$ s	$T_j=25^\circ\text{C}$	1.6	V
$I_{DRM}$	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^\circ\text{C}$	10	$\mu$ A
$I_{RRM}$		$T_j=150^\circ\text{C}$	1	mA

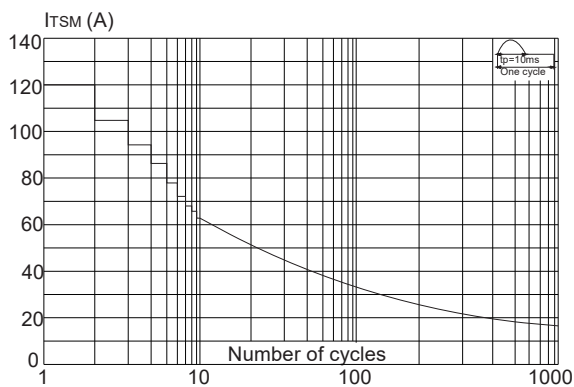
**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-251/ TO-220C/ TO-220A (Non-Ins)	1.3	°C/W
		TO-220A (Ins)	1.6	
		TO-220F (Ins)	1.7	

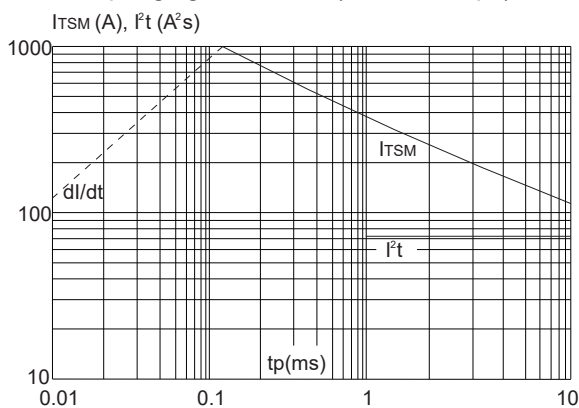
**FIG.1:** Maximum power dissipation versus RMS on-state current



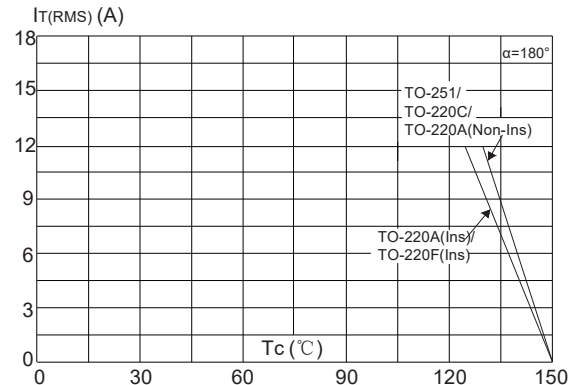
**FIG.3:** Surge peak on-state current versus number of cycles



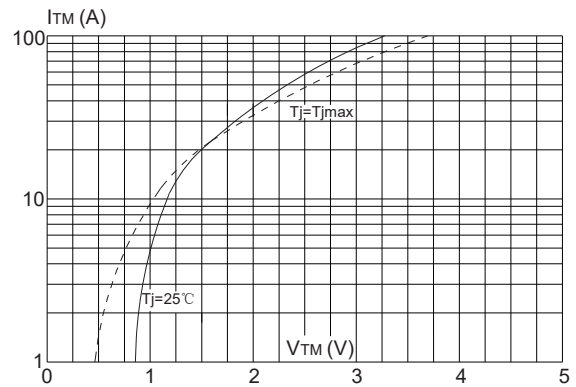
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )



**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

