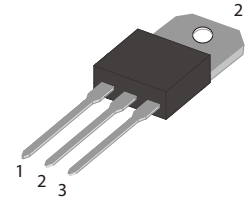


## FEATURES

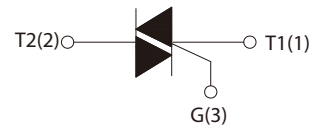
- | Direct interfacing to logic level ICs
- | Direct interfacing to low power gate drive circuits
- | High blocking voltage capability
- | Planar passivated for voltage ruggedness and reliability
- | Triggering in all four quadrant



TO-220B  
(Non-Insulated)

## APPLICATIONS

- | General purpose motor control circuits
- | Phase control operations in light dimmers and motor speed controllers
- | Home appliances



Schematic Symbol

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )	$V_{\text{DRM}}$	600	V
Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )	$V_{\text{RRM}}$	600	V
RMS on-state current ( $T_c=105^\circ\text{C}$ )	$I_{\text{T(RMS)}}$	4	A
Non repetitive surge peak on-state current (full cycle, F=50Hz)	$I_{\text{TSM}}$	35	
$I^2t$ value for fusing ( $t_p=10\text{ms}$ )	$I^2t$	6.1	$\text{A}^2\text{S}$
Critical rate of rise of on-state current ( $I_G=2*I_{GT}$ )	I - II - III	50	$\text{A}/\mu\text{s}$
	IV	10	
Peak gate current	$I_{\text{GM}}$	2	A
Average gate power dissipation	$P_{\text{G(AV)}}$	0.5	W
Peak gate power	$P_{\text{GM}}$	5	W
Operating junction temperature range	$T_j$	-40~+125	$^\circ\text{C}$
Storage junction temperature range	$T_{\text{STG}}$	-40~+150	

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

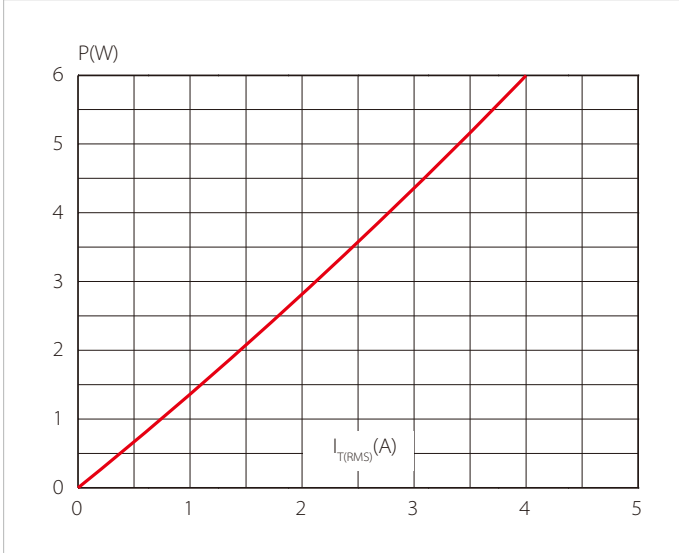
Symbol	Test Condition	Quadrant	Value				Unit
			T	D	E	F	
$I_{GT}$	$V_D=12V$	I - II - III	$\leq 5$	$\leq 5$	$\leq 10$	$\leq 25$	mA
		IV	$\leq 5$	$\leq 10$	$\leq 25$	$\leq 70$	
$V_{GT}$		ALL	$\leq 1.3$				V
$V_{GD}$	$V_D=V_{DRM}, R_L=3.3K\Omega, T_j=125^\circ\text{C}$		$\geq 0.2$				V
$I_H$	$I_T=100\text{mA}$		$\leq 5$	$\leq 15$	$\leq 25$	$\leq 30$	mA
$I_L$	$I_G=1.2I_{GT}$	I - III	$\leq 10$	$\leq 20$	$\leq 30$	$\leq 40$	
		II - IV	$\leq 15$	$\leq 35$	$\leq 45$	$\leq 60$	
$dV_D/dt$	$V_D=67\%V_{DRM}, T_j=125^\circ\text{C}$		$\geq 20$	$\geq 50$	$\geq 100$	$\geq 150$	V/ $\mu\text{s}$
$V_{TM}$	$I_{TM}=5.5A, t_p=380\mu\text{s}$		$\leq 1.6$				V
$I_{DRM}$	$V_D=V_{DRM}, V_R=V_{RRM}$	$T_j=25^\circ\text{C}$	$\leq 5$				$\mu\text{A}$
$I_{RRM}$		$T_j=125^\circ\text{C}$	$\leq 0.5$				mA

## THERMAL RESISTANCES

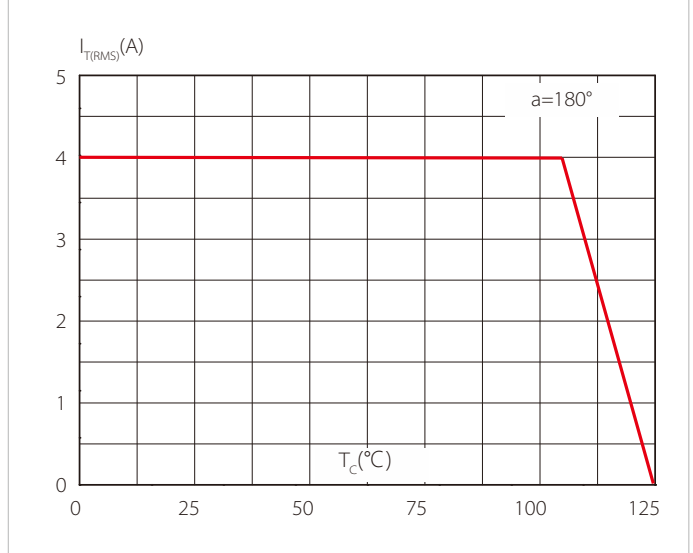
Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case(AC)	2.5	$^\circ\text{C}/W$

# PARAMETER CHARACTERISTIC CURVE

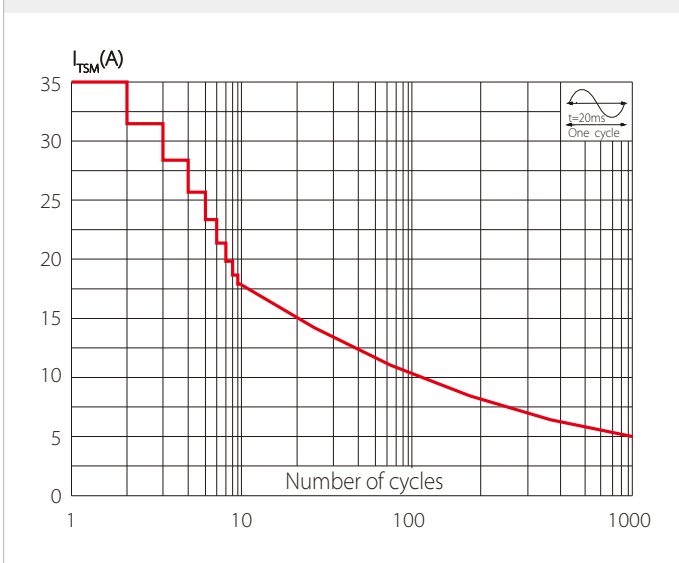
**FIG.1 Maximum power dissipation versus RMS on-state current**



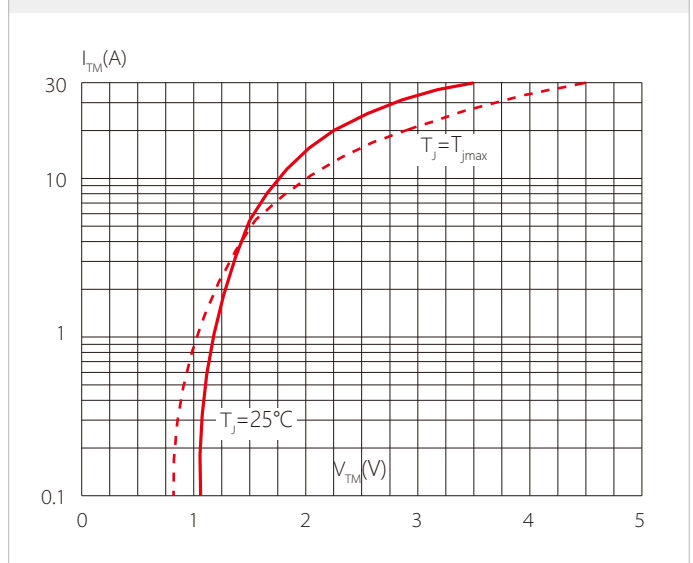
**FIG.2: RMS on-state current versus case temperature**



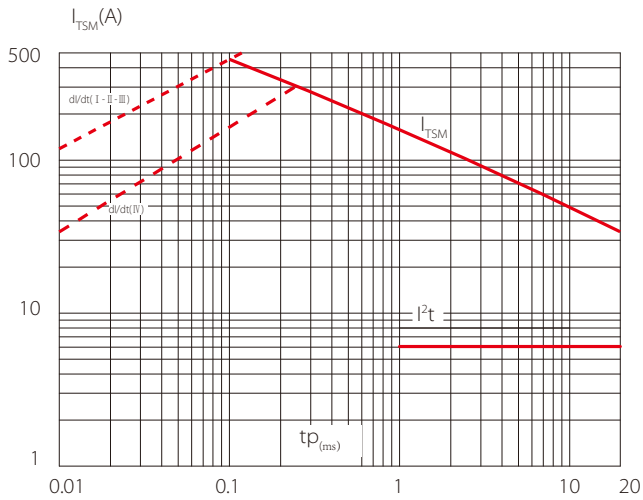
**FIG.3: Surge peak on-state current versus number of cycles**



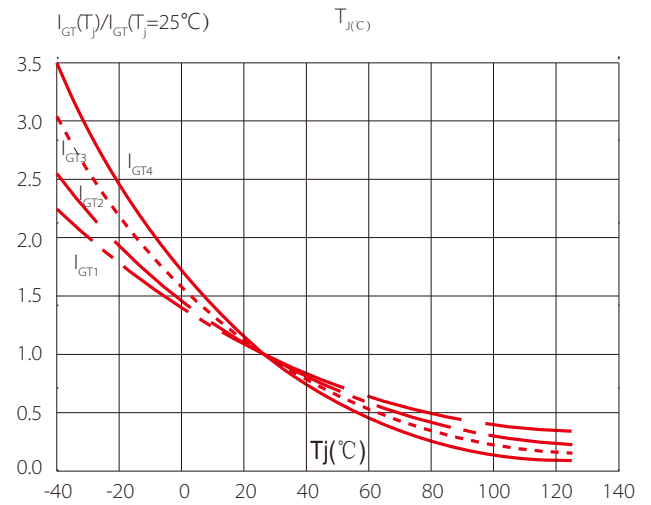
**FIG.4 On-state characteristics (maximum values)**



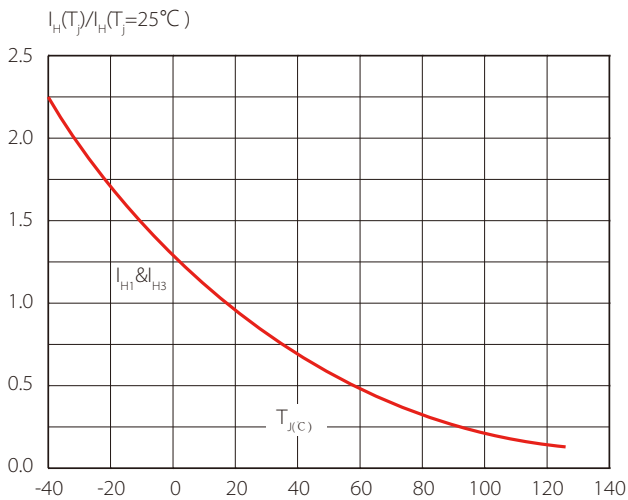
**FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$  and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )**



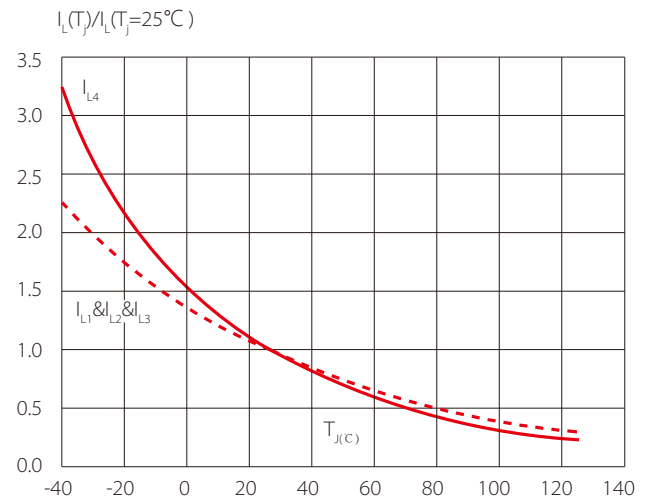
**FIG.6 Relative variations of gate trigger current versus junction temperature**



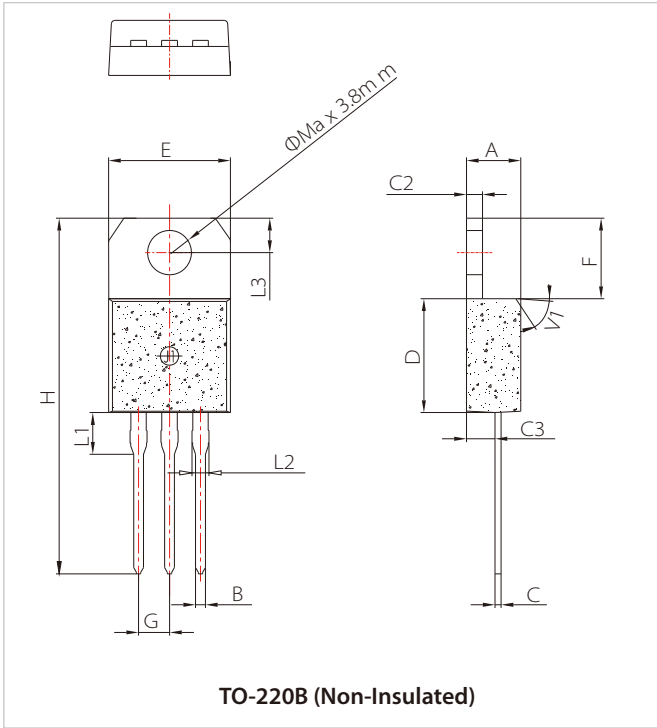
**FIG.7 Relative variations of holding current versus junction temperature**



**FIG.8 Relative variations of latching current versus junction temperature**



## PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.61		0.88	0.024		0.035
C	0.46		0.70	0.018		0.028
C2	1.21		1.32	0.048		0.052
C3	2.40		2.72	0.094		0.107
D	8.60		9.70	0.339		0.382
E	9.60		10.4	0.378		0.409
F	6.20		6.60	0.222		0.260
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	

## ORDERING INFORMATION

Part Number	Package	Qty/pcs		
		Tube	Inner Box	Carton
STB4Q60T(D/E/F)	TO-220B	50	1000	5000

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