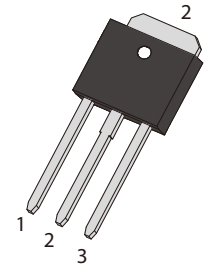


## FEATURES

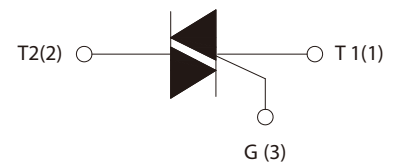
- | High current 12 A RMS current Triac
- | Low thermal resistance
- | High commutation or very high commutation capability
- | RoHS (2002/95/EC) compliant packages
- | UL-94, V0 flammability package resin compliance



TO-251

## 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 ( $T_c=105^\circ\text{C}$ )	$I_{\text{T(RMS)}}$	12	A
Non repetitive surge peak on-state current (full cycle, $F=50\text{Hz}$ )	$I_{\text{TSM}}$	95	
$I^2t$ value for fusing ( $t_p=10\text{ms}$ )	$I^2t$	45	$\text{A}^2\text{S}$
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)

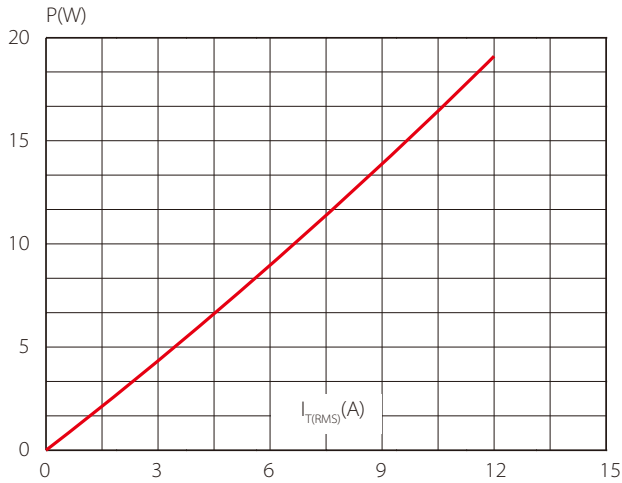
Symbol	Test Condition	Quadrant	Value				Unit
			D	E	F	G	
$I_{GT}$	$V_D=12\text{V}, R_L=33\Omega$	I - II - III	$\leq 5$	$\leq 10$	$\leq 25$	$\leq 50$	mA
		IV	$\leq 10$	$\leq 25$	$\leq 70$	$\leq 100$	
$V_{GT}$		ALL	$\leq 1.5$				V
$V_{GD}$	$V_D=V_{DRM}, R_L=3.3\text{K}\Omega, T_j=125^\circ\text{C}$	ALL	$\geq 0.2$				V
$I_H$	$I_t=100\text{mA}$		$\leq 10$	$\leq 25$	$\leq 30$	$\leq 60$	mA
$I_L$	$I_G=1.2I_{GT}$	I - III - IV	$\leq 15$	$\leq 30$	$\leq 40$	$\leq 60$	
		II	$\leq 20$	$\leq 40$	$\leq 80$	$\leq 90$	
$dV_D/dt$	$V_D=67\%V_{DRM}, T_j=125^\circ\text{C}$		$\geq 20$	$\geq 50$	$\geq 50$	$\geq 200$	V/ $\mu\text{s}$
$V_{TM}$	$I_{TM}=15\text{A}, t_p=380\mu\text{s}$		$\leq 1.6$				V
$I_{DRM}$	$V_D=V_{DRM}, V_R=V_{RRM}$	$T_j=25^\circ\text{C}$	$\leq 5$				$\mu\text{A}$
$I_{RRM}$		$T_j=125^\circ\text{C}$	$\leq 1$				mA

## THERMAL RESISTANCES

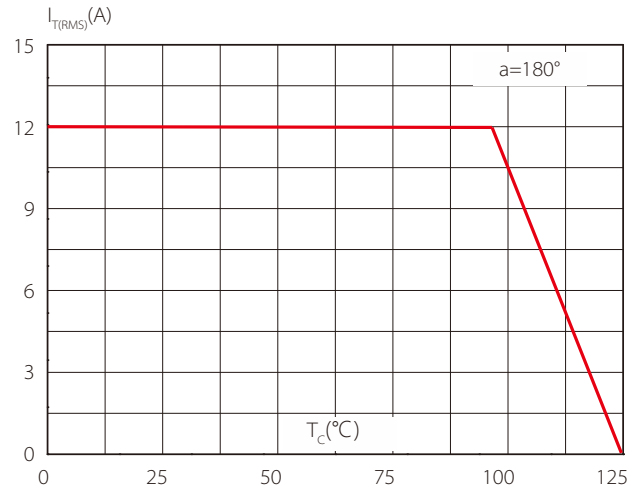
Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case(AC)	1.7	$^\circ\text{C}/\text{W}$

## PARAMETER CHARACTERISTIC CURVE

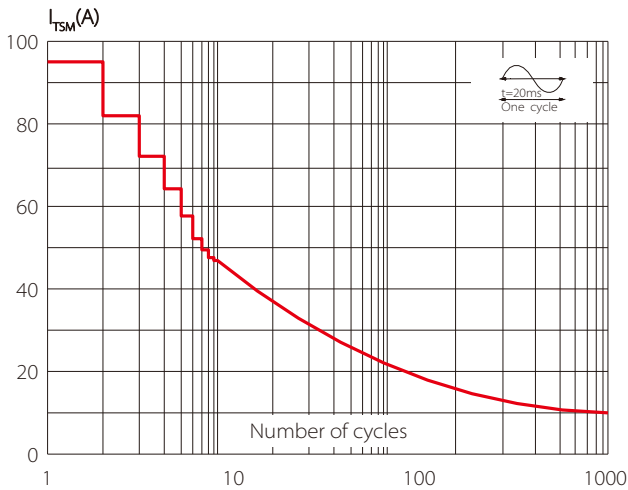
**FIG.1 Maximum power dissipation versus RMS on-state current**



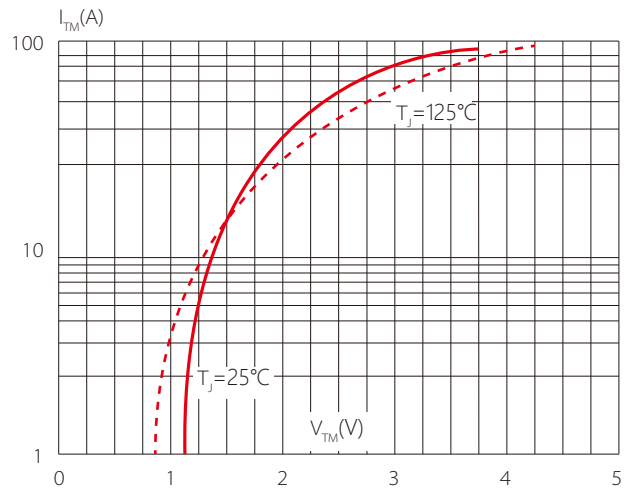
**FIG.2: RMS on-state current versus case temperature**



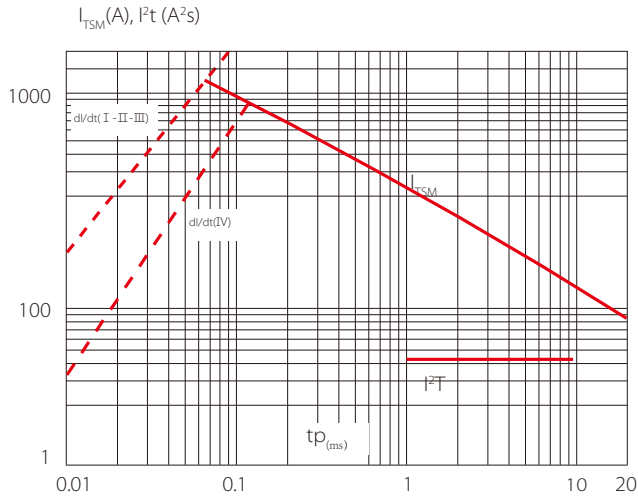
**FIG.3: Surge peak on-state current versus number of cycles**



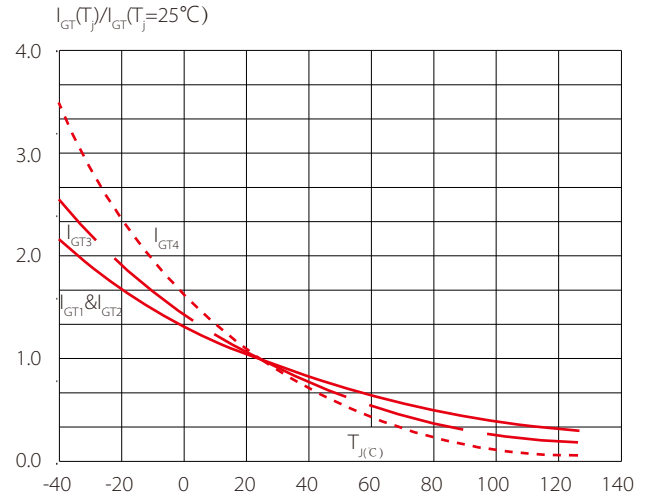
**FIG.4 On-state characteristics (maximum values)**



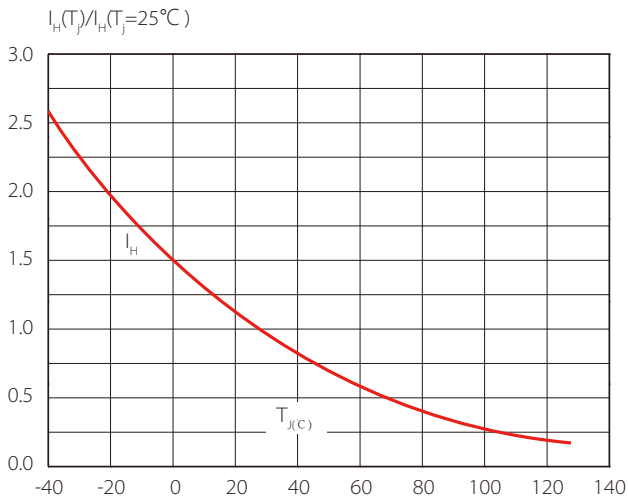
**FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$  and corresponding value of  $I^2t$  ( I - II - III:  $di/dt < 50\text{A}/\mu\text{s}$ ; IV:  $di/dt < 10\text{A}/\mu\text{s}$ )**



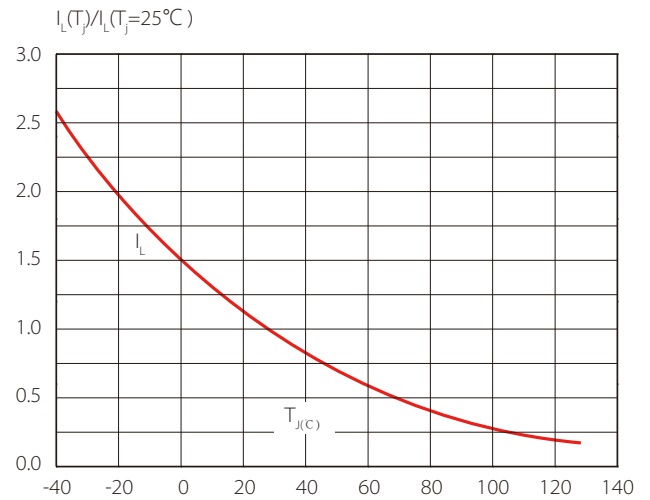
**FIG.6 Relative variations of gate trigger current versus junction temperature**



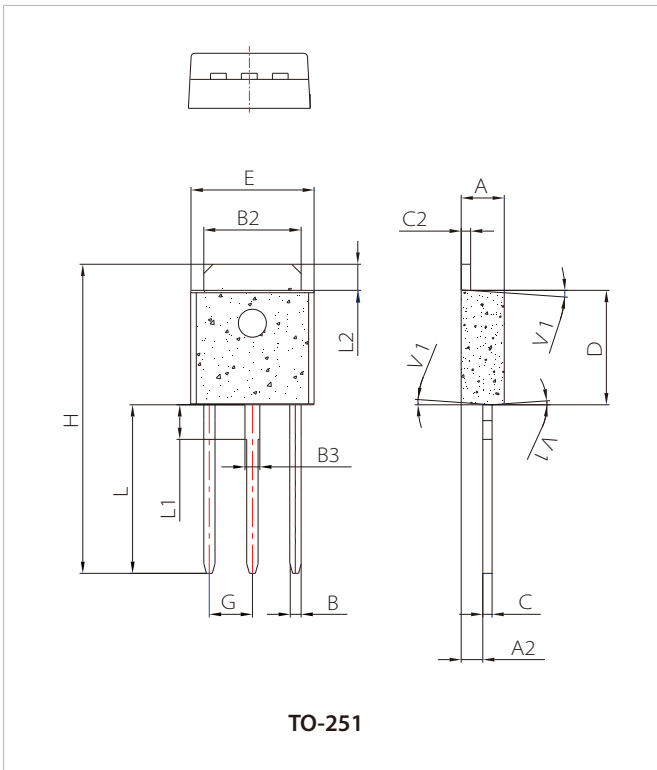
**FIG.7 Relative variations of holding current versus junction temperature**



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



## PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.90		1.20	0.035		0.047
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
B3	0.76		0.85	0.030		0.033
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G		2.30			0.091	
H	16.0		17.0	0.630		0.669
L	8.90		9.40	0.350		0.370
L1	1.80		1.90	0.071		0.075
L2	1.37		1.50	0.054		0.059
V1		4°			4°	

## ORDERING INFORMATION

Part Number	Package	Qty/pcs		
		Tube	Inner Box	Carton
STH12Q60D(E/F/G)	TO-251	80	4000	20000

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