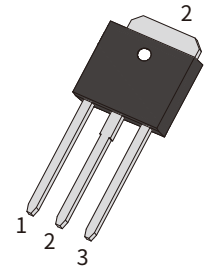


## FEATURES

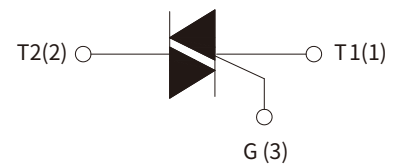
- | High current 12 A RMS current Triac
- | Low thermal resistance
- | High commutation or very high commutation capability



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 ( $T_j=25^\circ\text{C}$ )	$V_{\text{DRM}}$	800	V
Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )	$V_{\text{RRM}}$	800	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=50Hz)	$I_{\text{TSM}}$	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 ( $I_G=2 \cdot I_{\text{GT}}$ )	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<sub>j</sub>=25°C unless otherwise specified)

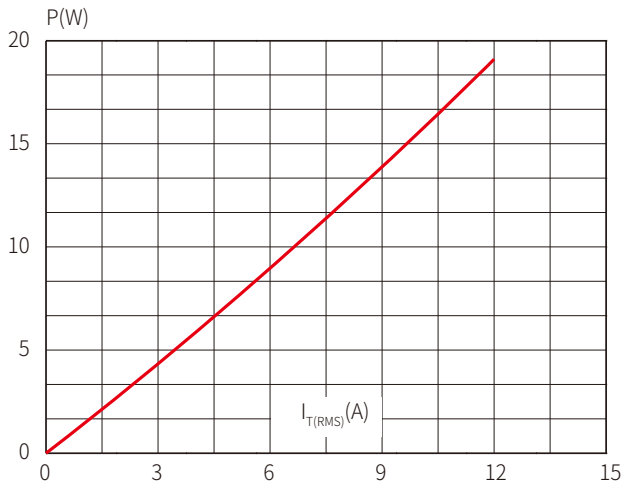
Symbol	Test Condition	Quadrant	Value				Unit
			D	E	F	G	
I <sub>GT</sub>	V <sub>D</sub> =12V, R <sub>L</sub> =33Ω	I - II - III	≤5	≤10	≤25	≤50	mA
		IV	≤10	≤25	≤70	≤100	
V <sub>GT</sub>		ALL	≤1.5				V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> , R <sub>L</sub> =3.3KΩ, T <sub>j</sub> =125°C	ALL	≥0.2				V
I <sub>H</sub>	I <sub>T</sub> =100mA		≤10	≤25	≤30	≤60	mA
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I - III - IV	≤15	≤30	≤40	≤60	
		II	≤20	≤40	≤80	≤90	
dV <sub>D</sub> /dt	V <sub>D</sub> =67%V <sub>DRM</sub> , T <sub>j</sub> =125°C		≥20	≥50	≥50	≥200	V/μs
V <sub>TM</sub>	I <sub>TM</sub> =15A, tp=380μs		≤1.6				V
I <sub>DRM</sub>	V <sub>D</sub> =V <sub>DRM</sub> , V <sub>R</sub> =V <sub>RRM</sub>	T <sub>j</sub> =25°C	≤5				μA
I <sub>RRM</sub>		T <sub>j</sub> =125°C	≤1				mA

## THERMAL RESISTANCES

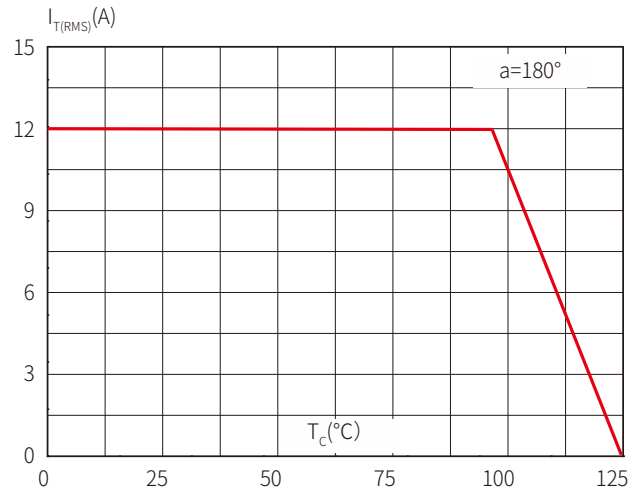
Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case(AC)	1.7	°C/W

# PARAMETER CHARACTERISTIC CURVE

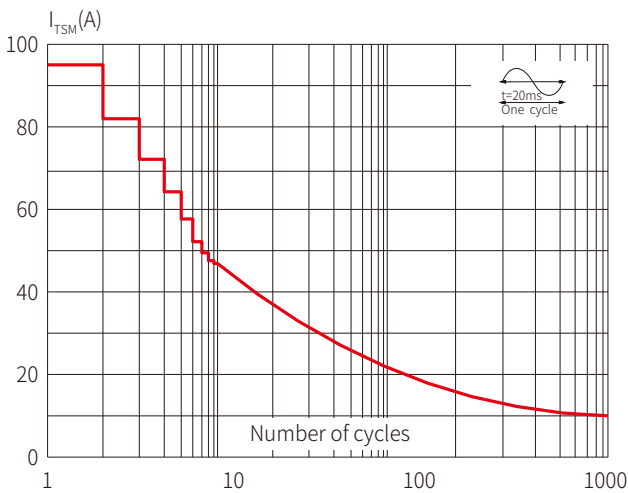
**FIG.1 Maximum power dissipation versus RMS on-state current**



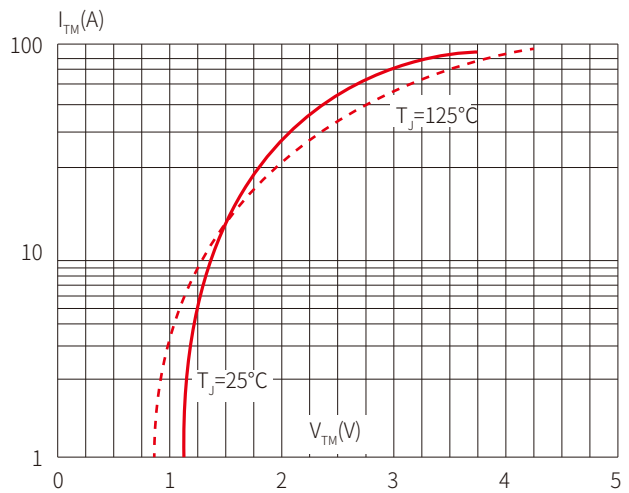
**FIG.2: RMS on-state current versus case temperature**



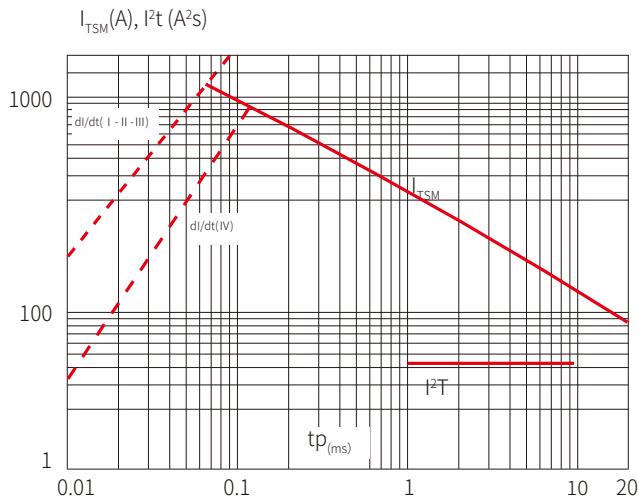
**FIG.3: Surge peak on-state current versus number of cycles**



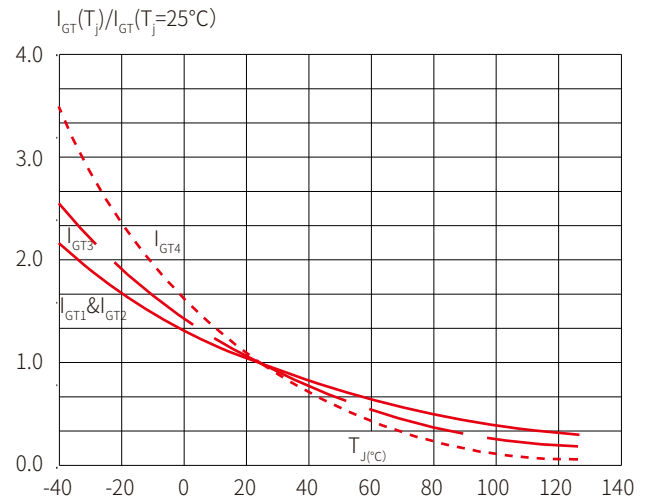
**FIG.4 On-state characteristics (maximum values)**



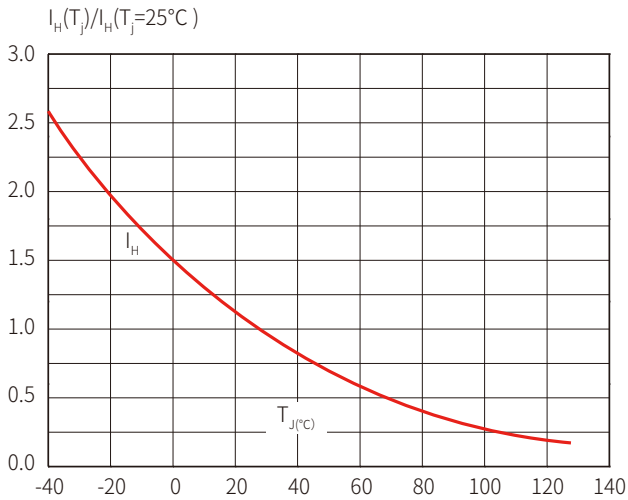
**FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$  and corresponding value of  $I^2t$  ( I - II -III:  $di/dt < 50\text{A}/\mu\text{s}$ ; IV:  $di/dt < 10\text{A}/\mu\text{s}$ )**



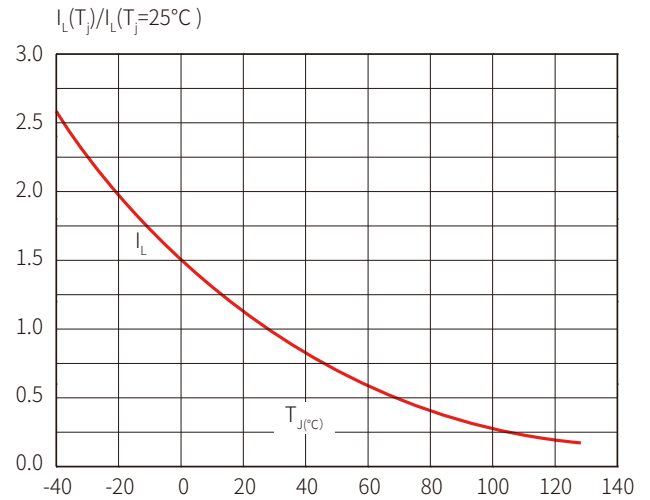
**FIG.6 Relative variations of gate trigger current versus junction temperature**



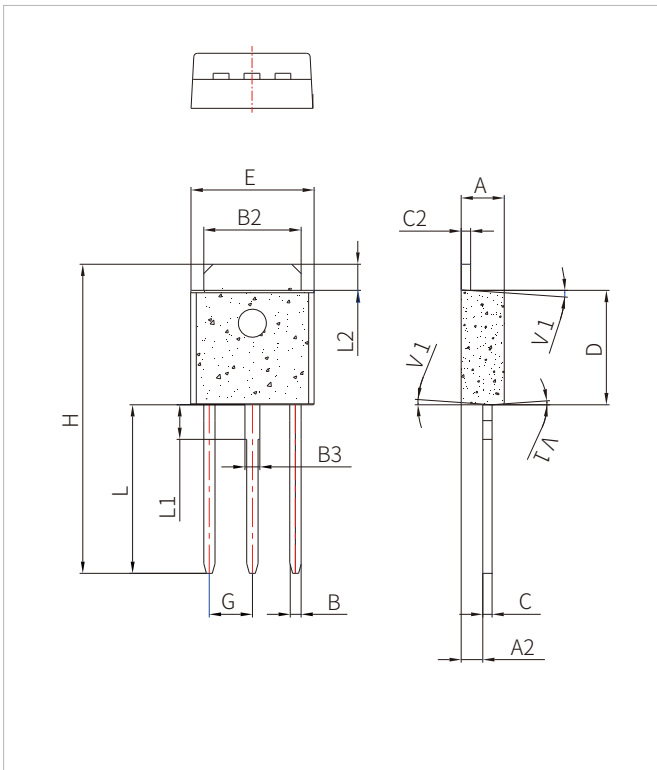
**FIG.7 Relative variations of holding current versus junction temperature**



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



## TO-251 PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
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	5.90		6.30	0.232		0.248
E	6.30		6.80	0.248		0.268
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		2.20	0.071		0.087
L2	1.37		1.50	0.054		0.059
V1		4°			4°	

## ORDERING INFORMATION

Part Number	Package	Qty/pcs		
		Tube	Inner Box	Carton
STH12Q80D(E/F/G)	TO-251	80	4000	20000

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