

## Snubberless™ high temperature 25 A Triacs

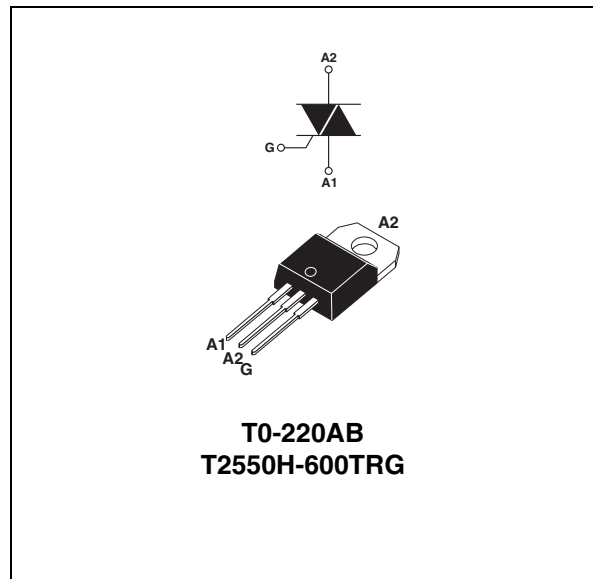
### Main features

Symbol	Value	Unit
$I_{T(RMS)}$	25	A
$V_{DRM}/V_{RRM}$	600	V
$I_{GT} (Q_i)$	50	mA

### Description

Specifically designed for use in high temperature environment (found in hot appliances such as cookers, ovens, hobs, electric heaters, coffee machines...), the new 25 A **T2550H** triacs provide an enhanced performance in terms of power loss and thermal dissipation. This allows for optimization of the heatsinking dimensioning, leading to space and cost effectiveness when compared to electro-mechanical solutions.

Based on ST snubberless technology, they offer high commutation switching capabilities and high noise immunity levels. And, thanks to their clip assembly technique, they provide a superior performance in surge current handling.



### Order code

Part Number	Marking
T2550H-600TRG	T2550H600T

**Table 1. Absolute maximum ratings**

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)		$T_c = 125^\circ\text{C}$ 25	A
$I_{TSM}$	Non repetitive surge peak on-state current (full cycle, $T_j$ initial = $25^\circ\text{C}$ )	F = 50 Hz $t = 20\text{ ms}$	250	A
		F = 60 Hz $t = 16.7\text{ ms}$	260	
$I^2t$	$I^2t$ Value for fusing	$t_p = 10\text{ ms}$	340	$\text{A}^2\text{s}$
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$	F = 120 Hz $T_j = 150^\circ\text{C}$	50	A/ $\mu\text{s}$
$V_{DSM}/V_{RSM}$	Non repetitive surge peak off-state voltage	$t_p = 10\text{ ms}$ $T_j = 25^\circ\text{C}$	700	V
$I_{GM}$	Peak gate current	$t_p = 20\ \mu\text{s}$ $T_j = 150^\circ\text{C}$	4	A
$P_{G(AV)}$	Average gate power dissipation	$T_j = 150^\circ\text{C}$	1	W
$T_{stg}$ $T_j$	Storage junction temperature range Operating junction temperature range		- 40 to + 150 - 40 to + 150	$^\circ\text{C}$

# 1 Characteristics

**Table 2. Electrical Characteristics** ( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions	Quadrant		Value	Unit
$I_{GT}^{(1)}$	$V_D = 12\text{ V}$ $R_L = 33\ \Omega$	I - II - III	MAX.	50	mA
$V_{GT}$		I - II - III	MAX.	1.3	V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3\ \text{k}\Omega$ $T_j = 150^\circ\text{C}$	I - II - III	MIN.	0.15	V
$I_H^{(2)}$	$I_T = 500\ \text{mA}$		MAX.	75	mA
$I_L$	$I_G = 1.2 I_{GT}$	I - II - III	MAX.	90	mA
$dV/dt^{(2)}$	$V_D = 67\% V_{DRM}$ gate open $T_j = 150^\circ\text{C}$		MIN.	500	V/ $\mu\text{s}$
$(di/dt)_c^{(2)}$	Without snubber $T_j = 150^\circ\text{C}$		MIN.	11.1	A/ms

1. minimum  $I_{GT}$  is guaranteed at 10% of  $I_{GT}$  max.
2. for both polarities of A2 referenced to A1.

**Table 3. Static Characteristics**

Symbol	Test Conditions			Value	Unit	
$V_T^{(1)}$	$I_{TM} = 35\ \text{A}$	$t_p = 380\ \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.5	V
$V_{to}^{(1)}$	Threshold voltage		$T_j = 150^\circ\text{C}$	MAX.	0.80	V
$R_d^{(1)}$	Dynamic resistance		$T_j = 150^\circ\text{C}$	MAX.	19	m $\Omega$
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$		$T_j = 25^\circ\text{C}$	MAX.	5	$\mu\text{A}$
			$T_j = 150^\circ\text{C}$		8.5	mA
	$V_{DRM}/V_{RRM} = 400\ \text{V}$ (at mains peak voltage)		$T_j = 150^\circ\text{C}$		5.5	

1. for both polarities of A2 referenced to A1.

**Table 4. Thermal resistance**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	0.8	$^\circ\text{C}/\text{W}$

Figure 1. Maximum power dissipation versus RMS on-state current (full cycle)

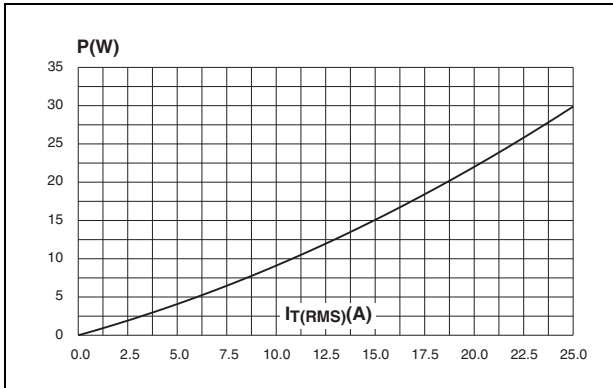


Figure 2. RMS on-state current versus case temperature (full cycle)

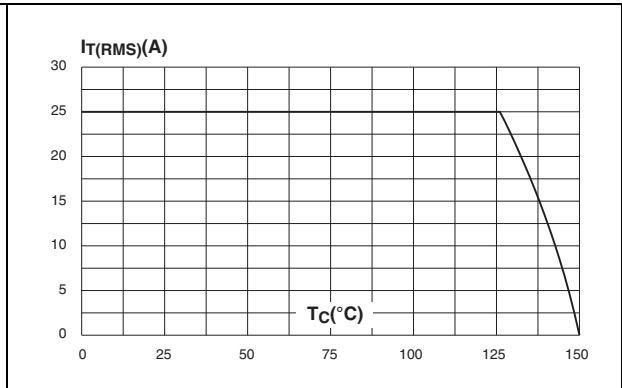


Figure 3. Relative variation of thermal impedance versus pulse duration

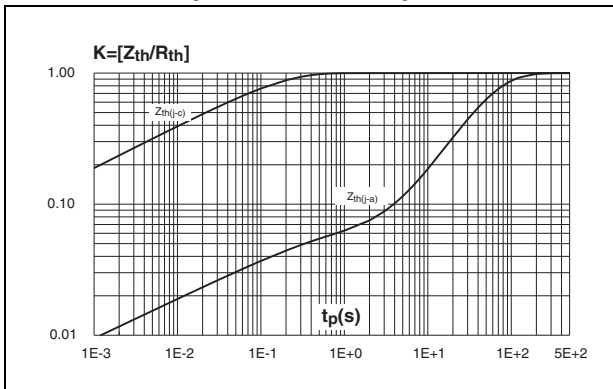


Figure 4. On-state characteristics (maximum values)

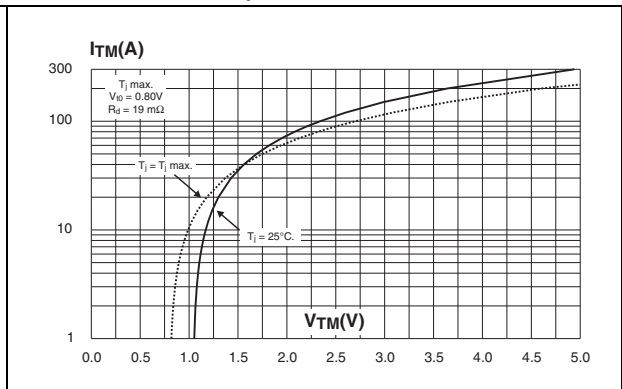


Figure 5. Surge peak on-state current versus number of cycles

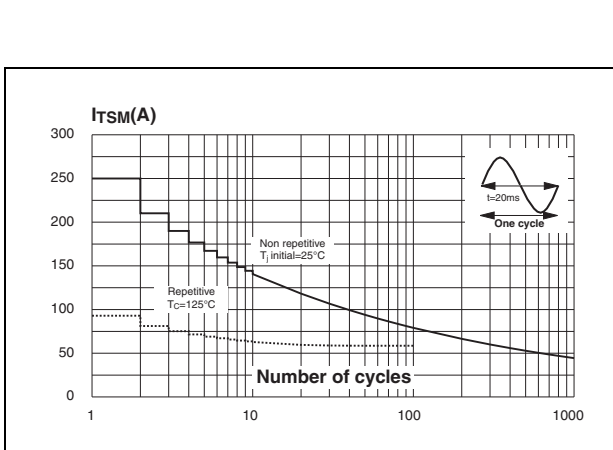
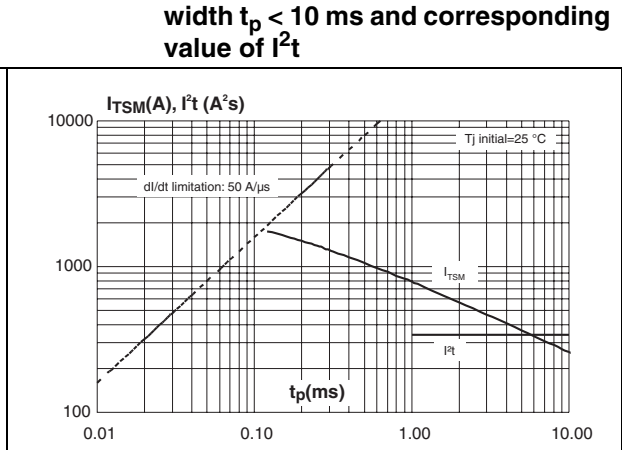
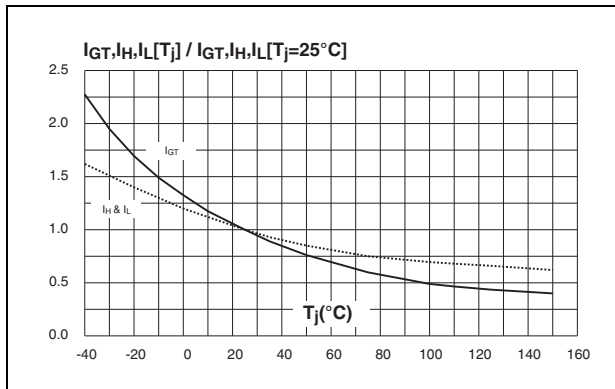


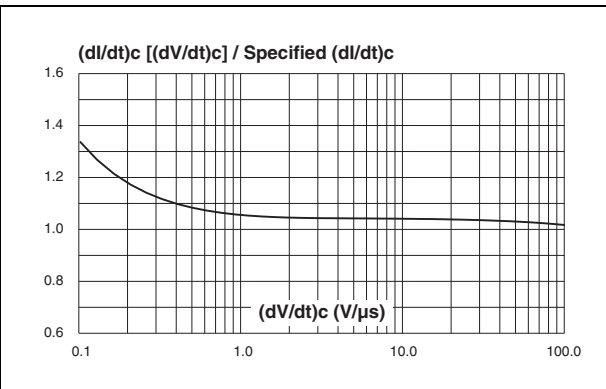
Figure 6. Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms and corresponding value of  $I^2t$



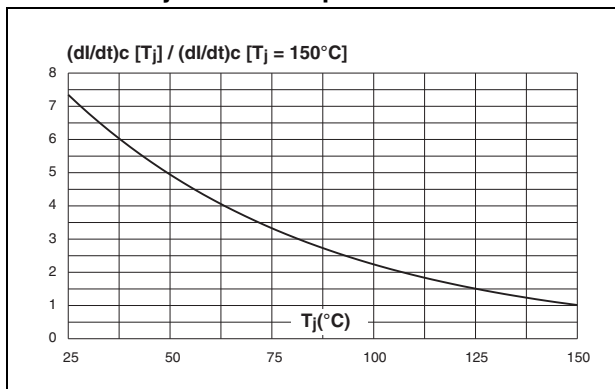
**Figure 7. Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)**



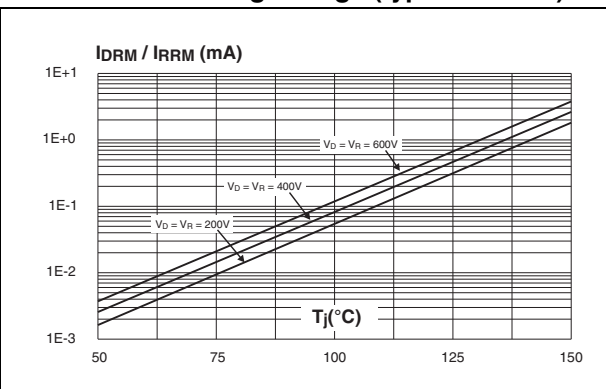
**Figure 8. Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values)**



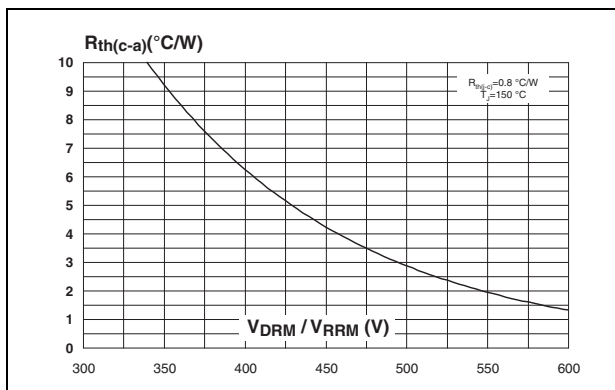
**Figure 9. Relative variation of critical rate of decrease of main current versus junction temperature**



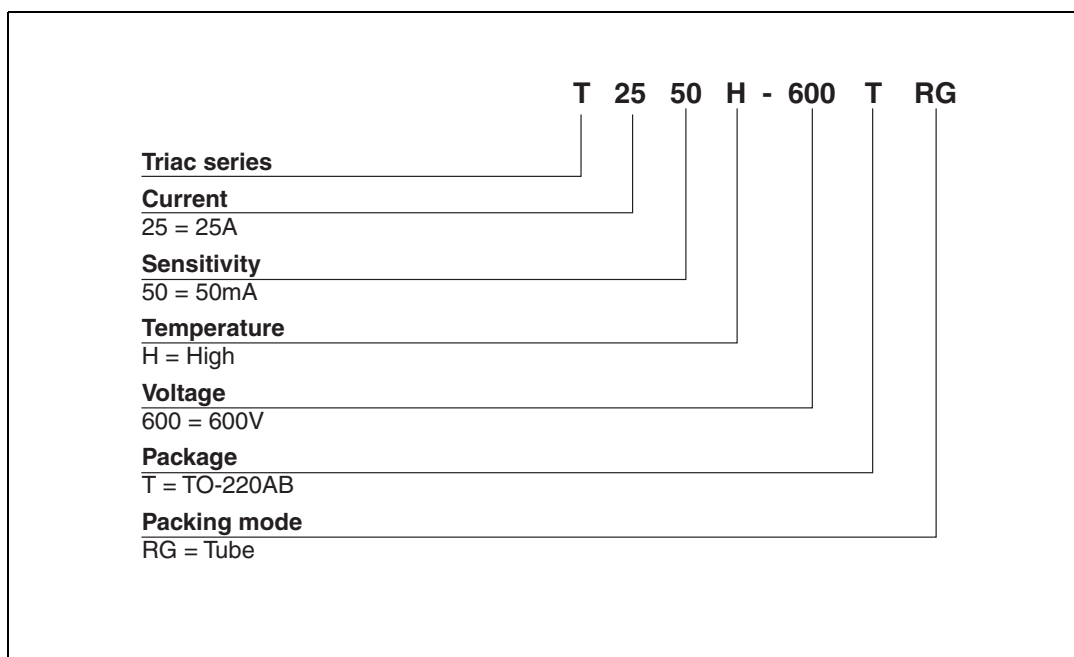
**Figure 10. Leakage current versus junction temperature for different values of blocking voltage (typical values)**



**Figure 11. Acceptable repetitive peak off-state voltage versus case-ambient thermal resistance**

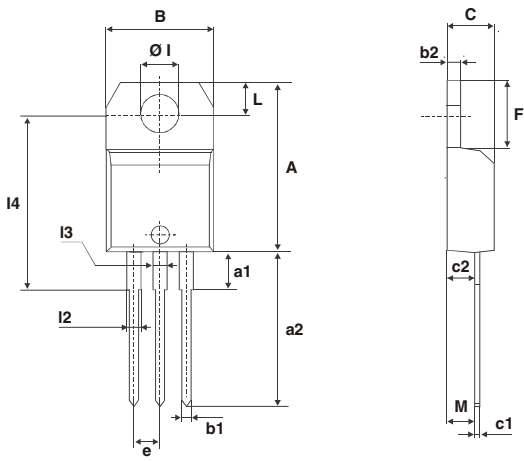


## 2 Ordering information scheme



### 3 Package information

Table 5. TO-220AB Dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com).

## 4 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
T2550H-600TRG	T2550H600T	TO-220AB	2.3 g	50	Tube

## 5 Revision history

Date	Revision	Changes
Apr-2002	5A	Last update.
13-Feb-2006	6	TO-220AB delivery mode changed from bulk to tube. ECOPACK statement added.
20-Jun-2006	7	Reformatted to current standards. Figures 6 and 11 replaced.

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