T2550H

High temperature 25 A Snubberless™ TRIAC

Features

- Medium current TRIAC
- 150 °C max. Tj turn-off commutation
- Low thermal resistance with clip bonding
- Very high 3 quadrant commutation capability
- RoHS (2002/95/EC) compliant package

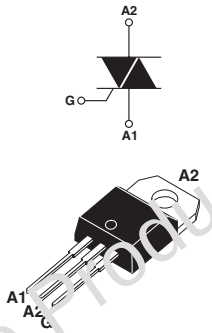
Applications

Specifically designed for use in high temperature environment (found in hot appliances such as cookers, ovens, hobs, electric heaters, coffee machines).

Description

This 25 A T2550H TRIAC provides an enhanced performance in terms of reduced power loss and thermal dissipation. This allows for the optimization of the heatsinking dimensions, leading to space and cost effectivness when compared to electro-mechanical solutions.

Based on ST snubberless technology, the T2550H offers high commutation switching capabilities and high noise immunity levels. Thanks to the clip assembly technique, it provides a superior performance in surge current handling.



T0-220AB
T2550H-600TRG

Table 1. Device summary

Symbol	Value	Unit
$I_{T(RMS)}$	25	A
V_{DRM}/V_{RRM}	600	V
$I_{GT\ (Q_1)}$	50	mA

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1 Characteristics

Table 2. Absolute maximum ratings

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

Table 3. Electrical characteristics (T_j = 25 °C, unless otherwise specified)

Symbol	Test Conditions	Quadrant		Value	Unit
I_{GT} (1)	V_D = 12 V R_L = 33 Ω	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 kΩ T_j = 150° C	I - II - III	MIN.	0.15	V
I_H (2)	I_T = 500 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° C		MIN.	500	V/µs
(dI/dt)c(2)	Without snubber T_j = 150° 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 4. Static Characteristics

Symbol	Test Conditions			Value	Unit
V_T (1)	I_{TM} = 35 A t_p = 380 µs	T_j = 25 °C	MAX.	1.5	V
V_{to} (1)	Threshold voltage	T_j = 150 °C	MAX.	0.80	V
R_d (1)	Dynamic resistance	T_j = 150 °C	MAX.	19	mΩ
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$	T_j = 25 °C	MAX.	5	µA
		T_j = 150 °C		8.5	mA
	V_{DRM}/V_{RRM} = 400 V (at mains peak voltage)	T_j = 150 °C		5.5	

1. for both polarities of A2 referenced to A1.

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Table 5. Thermal resistance

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

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

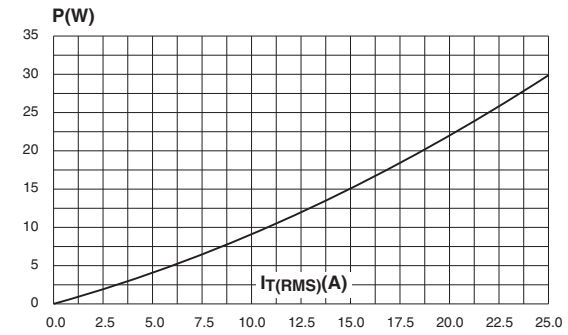

Figure 2. RMS on-state current versus case temperature (full cycle)

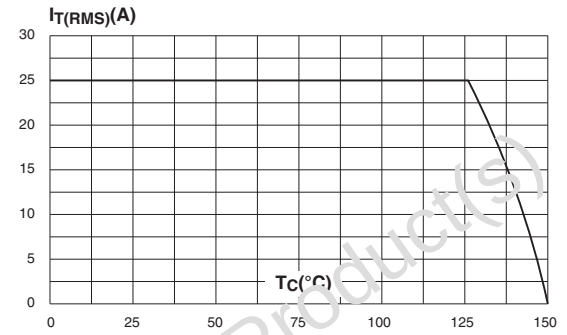

Figure 3. Relative variation of thermal impedance versus pulse duration

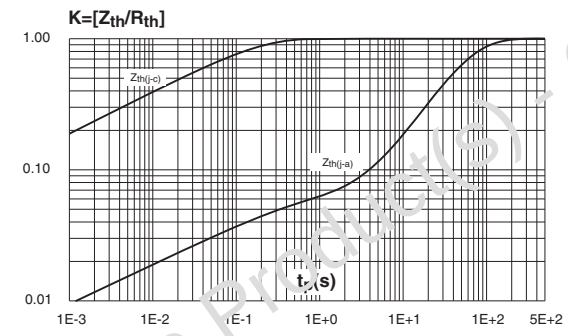

Figure 4. On-state characteristics (maximum values)

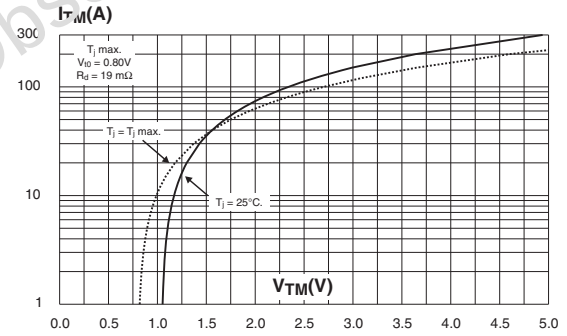

Figure 5. Surge peak on-state current versus number of cycles

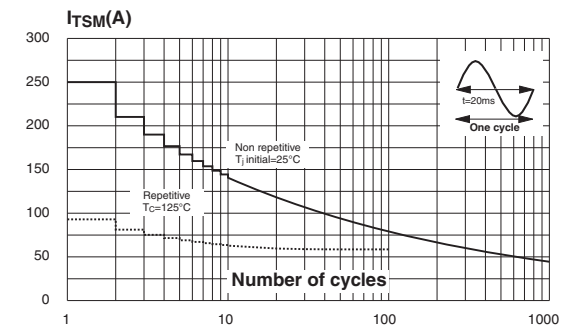

Figure 6. Non-repetitive surge peak on-state current for a sinusoidal pulse with width t_p < 10 ms and corresponding value of I^2t

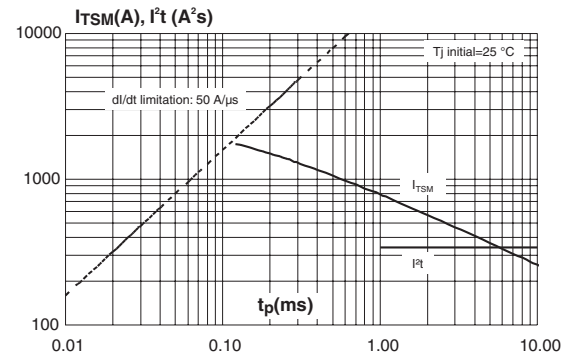

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Figure 7. Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

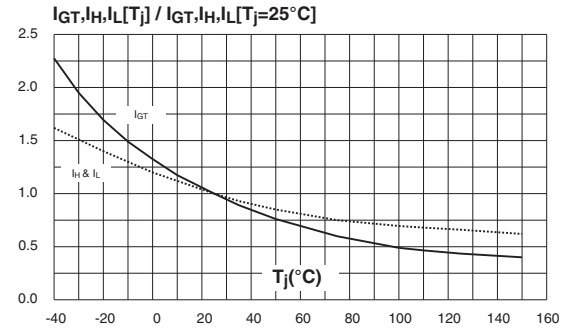


Figure 8. Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values)

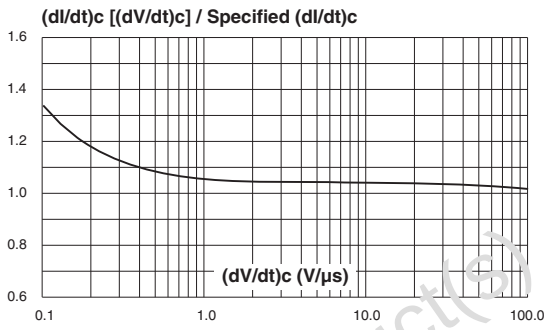


Figure 9. Relative variation of critical rate of decrease of main current versus junction temperature

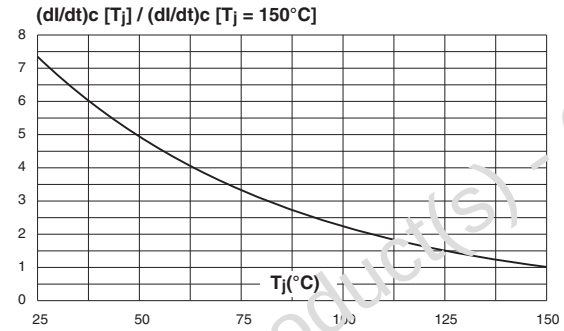


Figure 10. Leakage current versus junction temperature for different values of blocking voltage (typical values)

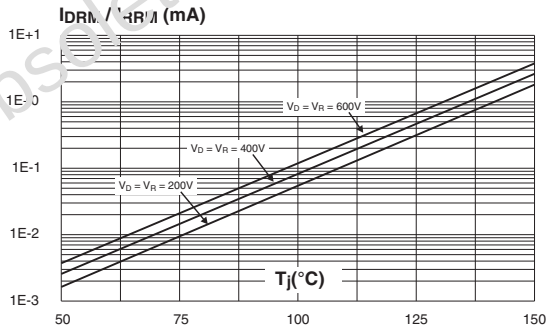
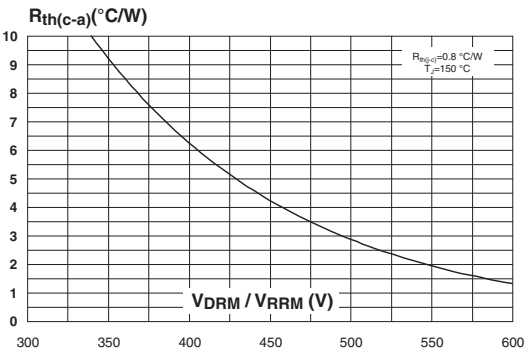


Figure 11. Acceptable repetitive peak off-state voltage versus case-ambient thermal resistance



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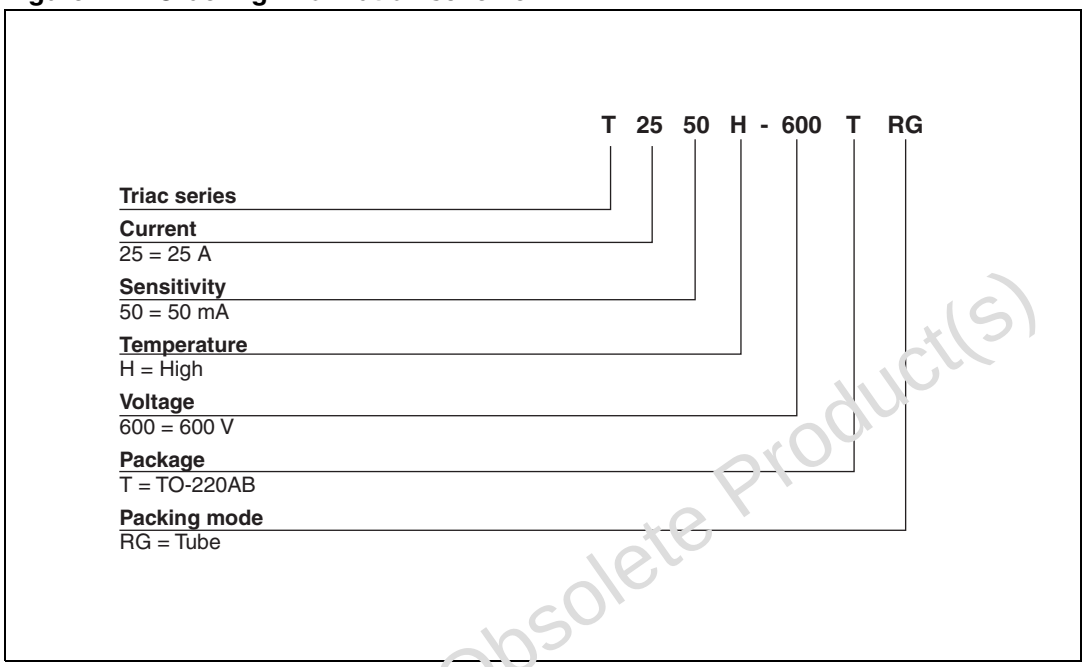
2 Ordering information scheme

Figure 12. Ordering information scheme



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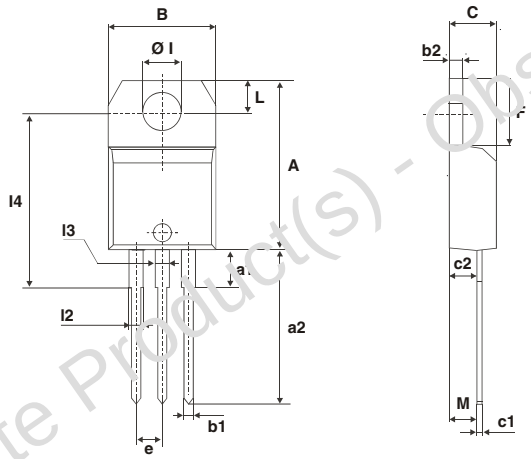
3 Package information

- Epoxy meets UL94, V0
- Recommended torque 0.4 to 0.6 N·m

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*.

Table 6. 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
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
M		2.60			0.102	

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4 Ordering information

Table 7. Ordering information

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

5 Revision history

Table 8. Document 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.
27-May-2008	8	Reformatted to current standards. ECOPACK statement updated.

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