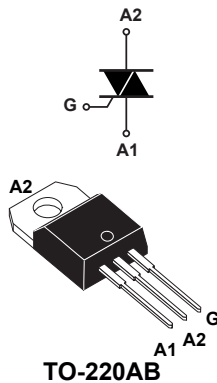


## 25 A - 800 V - T-series Triac in TO-220AB


**TO-220AB**


### Features

- 25 A medium current Triac
- 150 °C maximum junction temperature  $T_J$
- Surge capability  $V_{DSM}$ ,  $V_{RSM} = 900$  V
- Three triggering quadrants
- High noise immunity - static  $dV/dt$
- Robust dynamic turn-off commutation -  $(dI/dt)_c$
- **ECOPACK2** compliant component

### Applications

- General purpose AC line load control
- AC induction and universal motor control
- Heating: water heater, e-bidet
- Power tools
- Cooker, oven
- Lighting and automation I/O control
- Inrush current limiting circuits
- Overvoltage crowbar protection

### Description

The **T2535T-8T** Triac in TO-220AB can be used for the on/off or phase angle control function in general purpose AC switching.

Based on the ST Snubberless technology, it offers higher specified turn-off commutation and noise immunity levels up to 150 °C.

The **T2535T-8T** safely optimizes the control of the motors and heaters loads for the most constraining home appliances environments.

Product status link	
<a href="#">T2535T-8T</a>	
Product summary	
$I_{T(RMS)}$	25 A
$V_{DRM}$ , $V_{RRM}$	800 V
$V_{DSM}$ , $V_{RSM}$	900 V
$I_{GT}$	35 mA

# 1 Characteristics

**Table 1. Absolute maximum ratings (limiting values)**

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)		$T_c = 121\text{ °C}$ 25	A
$I_{TSM}$	Non repetitive surge peak on-state current (full cycle, $T_j$ initial = 25 °C)		$t = 16.7\text{ ms}$ 210	A
			$t = 20\text{ ms}$ 200	
$I^2t$	$I^2t$ value for fusing		$t_p = 10\text{ ms}$ 264	$A^2s$
$di/dt$	Critical rate of rise of on-state current, $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$ , $f = 100\text{ Hz}$		$f = 120\text{ Hz}$ 100	$A/\mu s$
$V_{DRM}/V_{RRM}$	Repetitive peak off-state voltage		$T_j = 125\text{ °C}$ 800	V
			$T_j = 150\text{ °C}$ 600	
$V_{DSM}/V_{RSM}$	Non Repetitive peak off-state voltage	$t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	900	V
$I_{GM}$	Peak gate current	$t_p = 20\text{ }\mu s$ $T_j = 150\text{ °C}$	4	A
$P_{GM}$	Maximum gate power dissipation	$t_p = 20\text{ }\mu s$ $T_j = 150\text{ °C}$	5	W
$P_{G(AV)}$	Average gate power dissipation	$T_j = 150\text{ °C}$	1	W
$T_{stg}$	Storage temperature range		-40 to +150	°C
$T_j$	Operating junction temperature range		-40 to +150	°C
$T_L$	Maximum lead temperature for soldering during 10 s		260	°C

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

Symbol	Test conditions	Quadrants		Value	Unit
$I_{GT}$	$V_D = 12\text{ V}$ , $R_L = 30\text{ }\Omega$	I - II - III	Min.	5	mA
			Max.	35	
$V_{GT}$			Max.	1	V
$V_{GD}$	$V_D = V_{DRM}$ , $R_L = 3.3\text{ k}\Omega$ , $T_j = 150\text{ °C}$	I - II - III	Min.	0.15	V
$I_L$	$I_G = 1.2 \times I_{GT}$	I - III	Max.	50	mA
		II	Max.	80	
$I_H^{(1)}$	$I_T = 500\text{ mA}$ , gate open		Max.	35	mA
$dV/dt^{(1)}$	$V_D = 536\text{ V}$ , gate open	$T_j = 125\text{ °C}$	Min.	1500	$V/\mu s$
	$V_D = 402\text{ V}$ , gate open	$T_j = 150\text{ °C}$	Min.	1000	$V/\mu s$
$(di/dt)_c^{(1)}$	Without snubber network	$T_j = 125\text{ °C}$	Min.	28	$A/ms$
		$T_j = 150\text{ °C}$	Min.	18	$A/ms$

1. For both polarities of A2 referenced to A1.

**Table 3. Static characteristics**

Symbol	Test conditions			Value	Unit
$V_{TM}^{(1)}$	$I_T = 35\text{ A}$ , $t_p = 380\ \mu\text{s}$	$T_j = 25\text{ }^\circ\text{C}$	Max.	1.5	V
$V_{TO}^{(1)}$	Threshold voltage	$T_j = 150\text{ }^\circ\text{C}$	Max.	0.80	V
$R_D^{(1)}$	Dynamic resistance	$T_j = 150\text{ }^\circ\text{C}$	Max.	17	m $\Omega$
$I_{DRM}/I_{RRM}$	$V_D = V_R = 800\text{ V}$ , peak voltage	$T_j = 25\text{ }^\circ\text{C}$	Max.	5	$\mu\text{A}$
		$T_j = 125\text{ }^\circ\text{C}$		5	mA
	$V_D = V_R = 600\text{ V}$ , peak voltage	$T_j = 150\text{ }^\circ\text{C}$	Max.	6	mA
		$T_j = 150\text{ }^\circ\text{C}$	Max.	5	

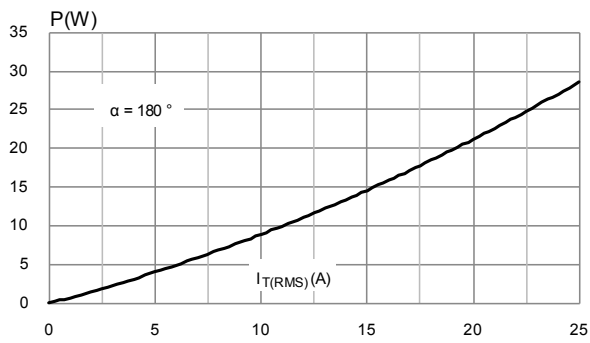
1. For both polarities of A2 referenced to A1.

**Table 4. Thermal resistance**

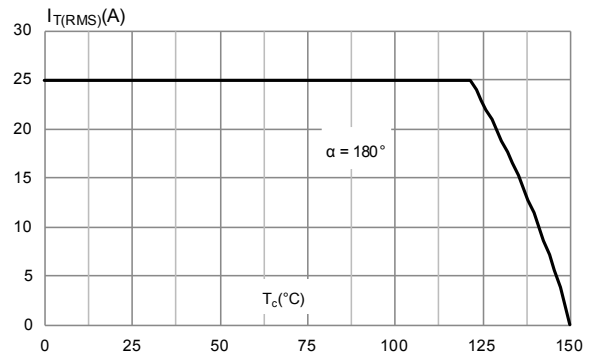
Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	Max.	1	$^\circ\text{C/W}$
$R_{th(j-a)}$	Junction to ambient	Typ.	60	

## 1.1 Characteristics (curves)

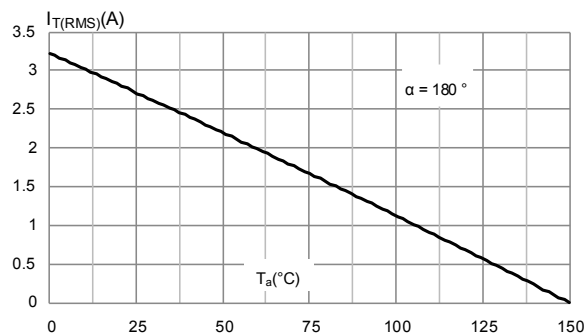
**Figure 1. Maximum power dissipation versus on-state RMS current (full cycle)**



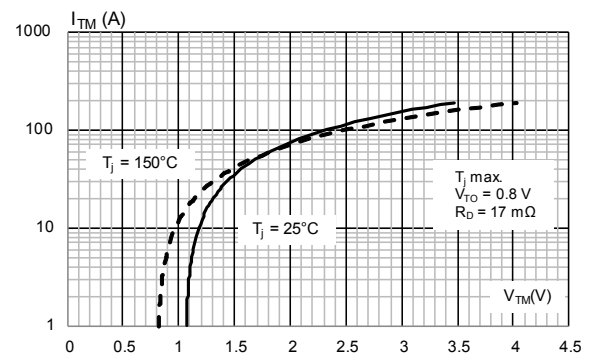
**Figure 2. On-state RMS current cycle versus case temperature (full cycle)**



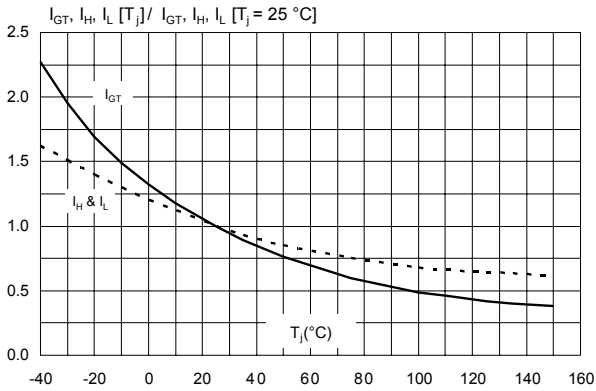
**Figure 3. On-state RMS current versus ambient temperature (free air convection)**



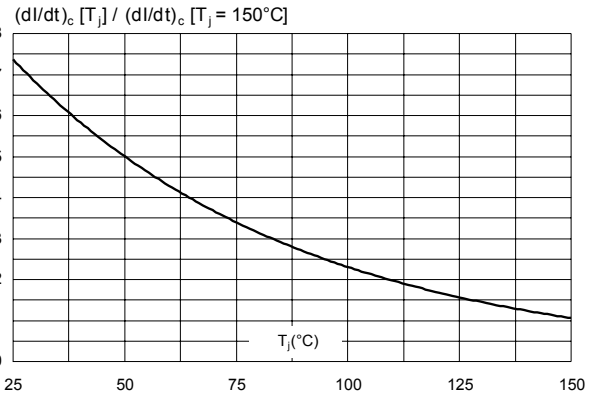
**Figure 4. On-state characteristics (maximum)**



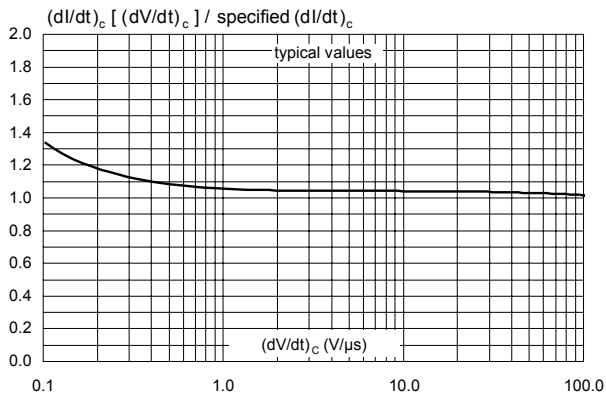
**Figure 5. Relative variation of  $I_{GT}, I_H, I_L$  vs junction temperature (typical values)**



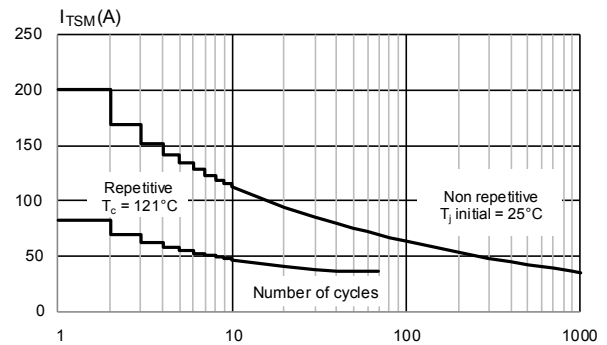
**Figure 6. Relative variation of critical rate of decrease of main current versus junction temperature**



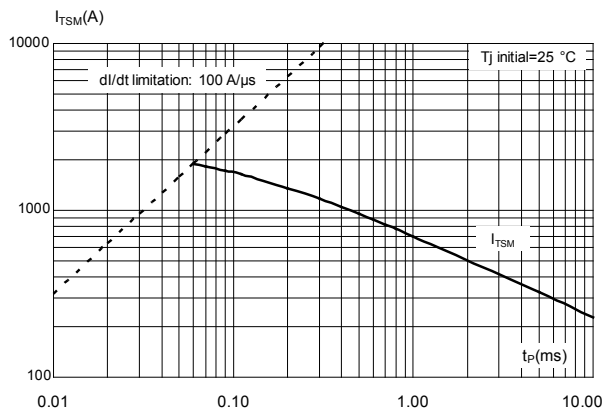
**Figure 7. Relative variation of critical rate of decrease of current  $(di/dt)_c$  versus reapplied  $(dV/dt)_c$**



**Figure 8. Surge peak on-state current versus number of cycles**



**Figure 9. Non repetitive surge peak on-state current for a sinusoidal pulse width  $t_p < 10$  ms**



**Figure 10. Relative variation of thermal impedance versus pulse duration**

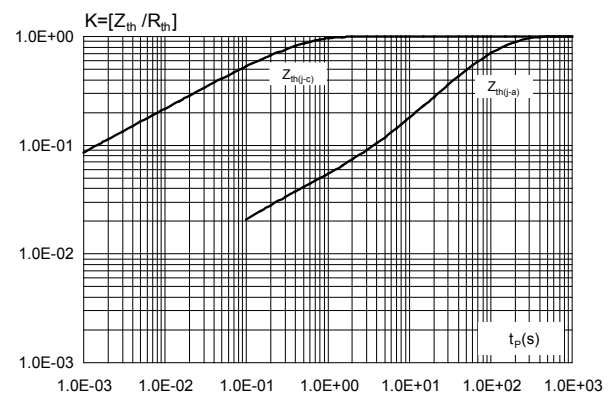
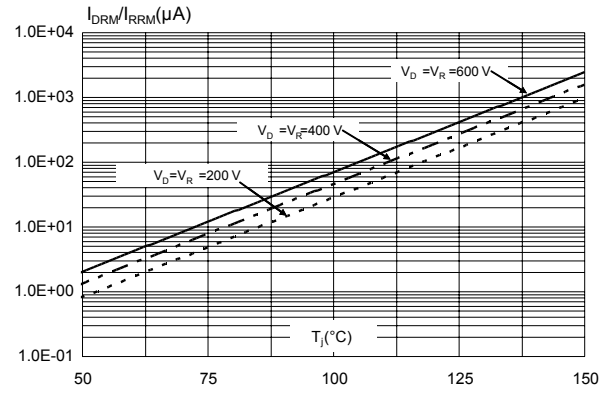


Figure 11. Leakage current versus junction temperature for different values of blocking voltage (typical values)



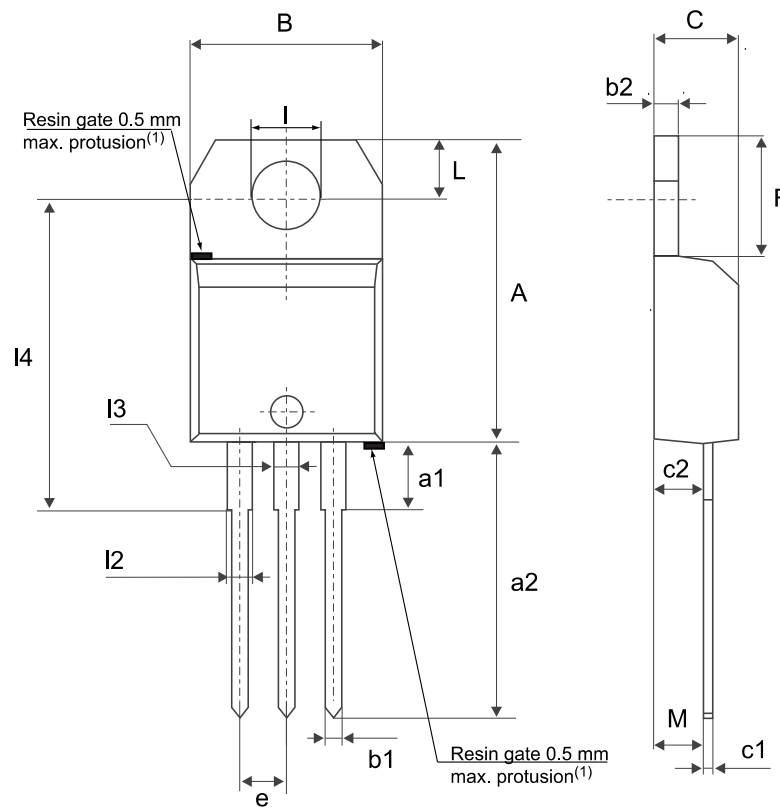
## 2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK is an ST trademark.

### 2.1 TO-220AB package information

- Molding compound resin is halogen free and meets UL94 flammability standard, level V0
- Lead-free plating package leads
- Recommended torque: 0.4 to 0.6 N·m

Figure 12. TO-220AB package outline



(1) Resin gate position accepted in one of the two positions or in the symmetrical opposites.

**Table 5. TO-220AB package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches <sup>(1)</sup>		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.5984		0.6260
a1		3.75			0.1476	
a2	13.00		14.00	0.5118		0.5512
B	10.00		10.40	0.3937		0.4094
b1	0.61		0.88	0.0240		0.0346
b2	1.23		1.32	0.0484		0.0520
C	4.40		4.60	0.1732		0.1811
c1	0.49		0.70	0.0193		0.0276
c2	2.40		2.72	0.0945		0.1071
e	2.40		2.70	0.0945		0.1063
F	6.20		6.60	0.2441		0.2598
l	3.73		3.88	0.1469		0.1528
L	2.65		2.95	0.1043		0.1161
l2	1.14		1.70	0.0449		0.0669
l3	1.14		1.70	0.0449		0.0669
l4	15.80	16.40	16.80	0.6220	0.6457	0.6614
M		2.6			0.1024	

1. Inch dimensions are for reference only.

### 3 Ordering information

Figure 13. Ordering information scheme

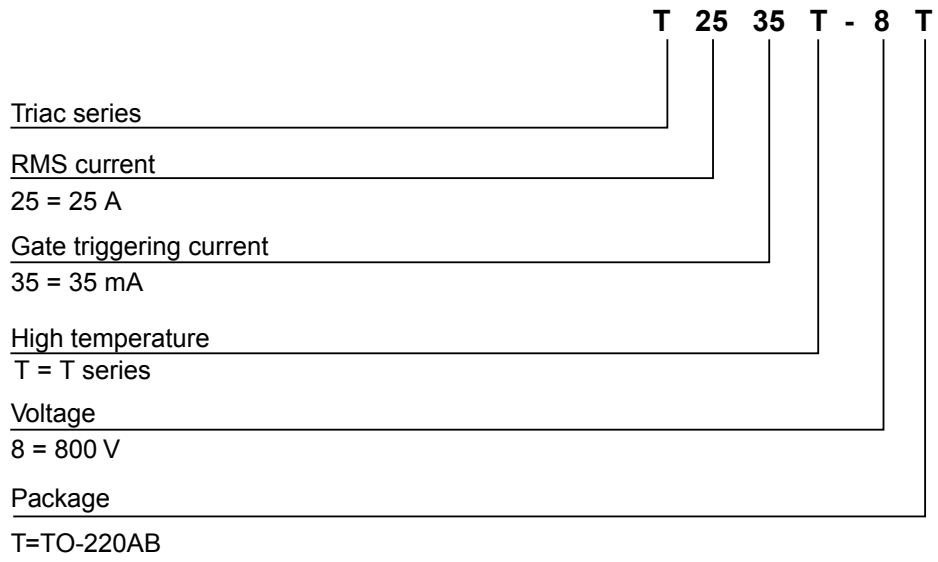


Table 6. Ordering information

Order code	Marking	Package	Weight	Base Qty.	Delivery mode
T2535T-8T	T2535T-8T	TO-220AB	2.1 g	50	Tube

## Revision history

**Table 7. Document revision history**

Date	Version	Changes
23-Sep-2020	1	Initial release.

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