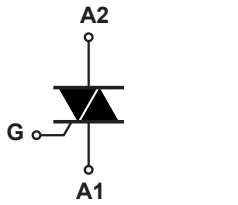
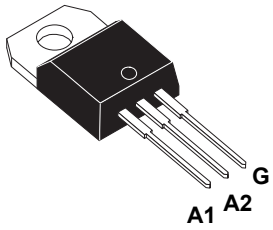
25 A - 800 V - T-series Triac in TO-220AB insulated





TO-220AB insulated

Product status link
T2535T-8I

Product summary	
$I_{T(RMS)}$	25 A
V_{DRM}, V_{RRM}	800 V
V_{DSM}, V_{RSM}	900 V
I_{GT}	35 mA

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
- Comply with UL1557 insulation:
  - 2.5 kV - reference file: E81734

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-8I Triac in TO-220AB package 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-8I safely optimizes the control of the motors and heaters loads for the most constraining home appliances environments.

By using an internal ceramic pad, the TO-220AB insulated package provides a UL recognized component isolation, rated at 2500 V_{RMS}.

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 = 101 °C	25	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25 °C)		t = 16.7 ms	210	A
			t = 20 ms	200	
I^2t	I^2t value for fusing		t_p = 10 ms	264	A^2s
dI/dt	Critical rate of rise of on-state current, I_G = 2 x I_{GT}, tr ≤ 100 ns, f = 100 Hz		f = 120 Hz	100	A/µs
V_{DRM}/ V_{RRM}	Repetitive peak off-state voltage		T_j = 125 °C	800	V
			T_j = 150 °C	600	
V_{DSM}/ V_{RSM}	Non Repetitive peak off-state voltage	t_p = 10 ms	T_j = 25 °C	900	V
I_{GM}	Peak gate current	t_p = 20 µs	T_j = 150 °C	4	A
P_{GM}	Maximum gate power dissipation	t_p = 20 µs	T_j = 150 °C	5	W
$P_{G(AV)}$	Average gate power dissipation		T_j = 150 °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
V_{INS}	Insulation RMS voltage, 1 minute			2.5	kV

Table 2. Electrical characteristics (T_j = 25 °C, unless otherwise specified)

Symbol	Test conditions	Quadrants		Value	Unit
I_{GT}	V_D = 12 V, R_L = 30 Ω	I - II - III	Min.	5	mA
			Max.	35	
V_{GT}			Max.	1	V
V_{GD}	V_D = V_{DRM}, R_L = 3.3 kΩ, T_j = 150 °C	I - II - III	Min.	0.15	V
I_L	I_G = 1.2 x I_{GT}	I - III	Max.	50	mA
		II	Max.	80	
I_H (1)	I_T = 500 mA, gate open		Max.	35	mA
dV/dt (1)	V_D = 536 V, gate open	T_j = 125 °C	Min.	1500	V/µs
	V_D = 402 V, gate open	T_j = 150 °C	Min.	1000	V/µs
(dI/dt)c (1)	Without snubber network	T_j = 125 °C	Min.	28	A/ms
		T_j = 150 °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 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.	17	mΩ
I_{DRM}/I_{RRM}	$V_D = V_R$ = 800 V, peak voltage	T_j = 25 °C	Max.	5	µA
		T_j = 125°C		5	mA
	$V_D = V_R$ = 600 V, peak voltage	T_j = 150 °C	Max.	6	mA
	$V_D = V_R$ = 400 V, peak voltage	T_j = 150 °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.	1.7	°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)

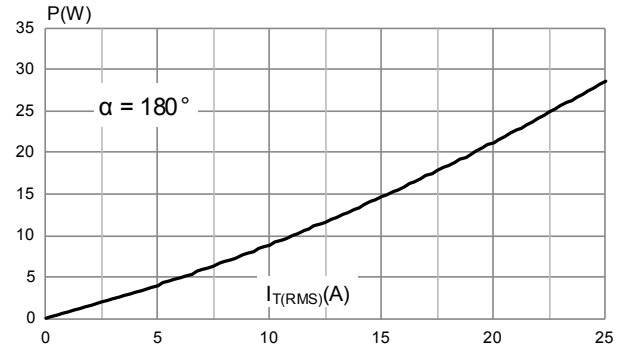


Figure 2. On-state RMS current versus case temperature (full cycle)

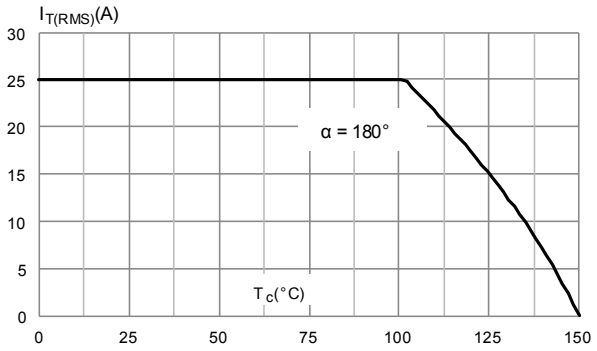


Figure 3. On-state RMS current versus ambient temperature (free air convection)

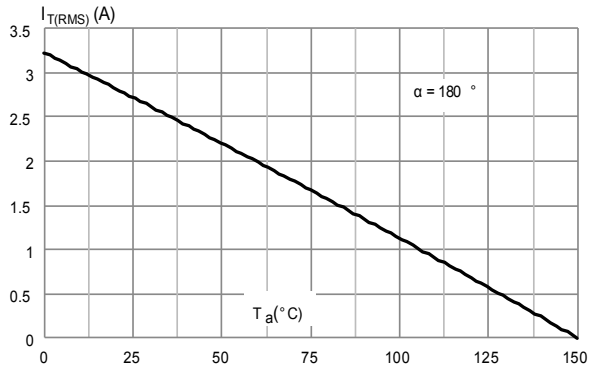


Figure 4. On-state characteristics (maximum)

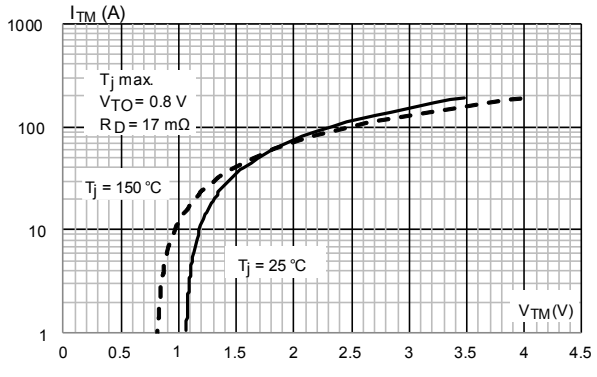


Figure 5. Relative variation of I_{GT},I_H, I_L vs junction temperature (typical values)

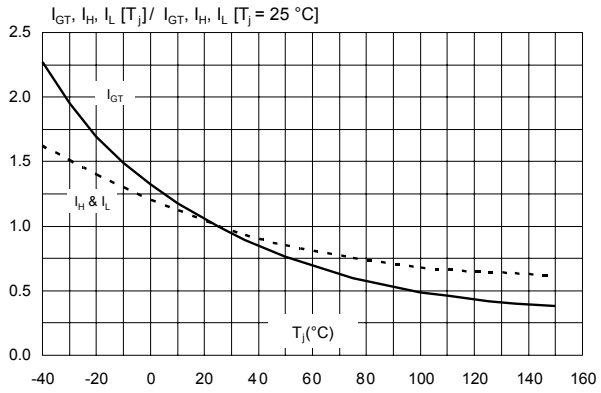


Figure 6. Relative variation of critical rate of decrease of main current versus junction temperature

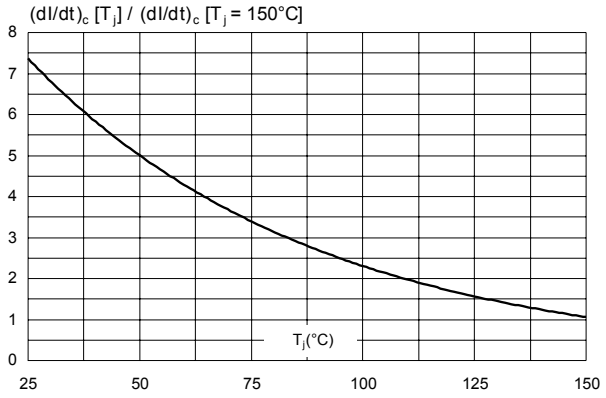


Figure 7. Relative variation of critical rate of decrease of current (dI/dt)c versus reapplied (dV/dt)c

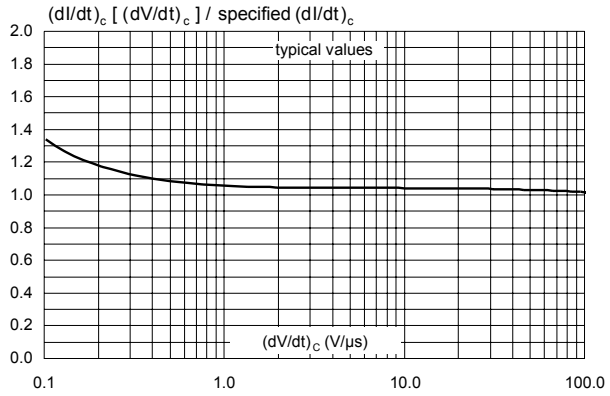


Figure 8. Surge peak on-state current versus number of cycles

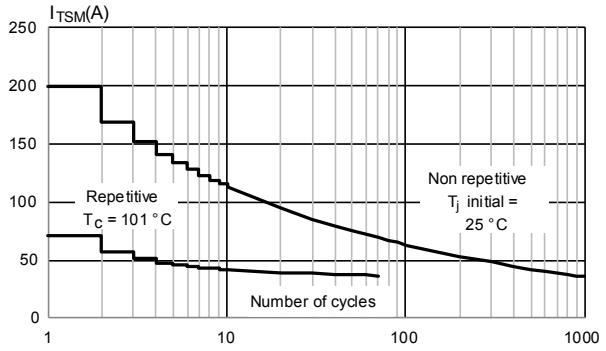


Figure 9. Non repetitive surge peak on-state current for a sinusoidal pulse width t_P < 10 ms

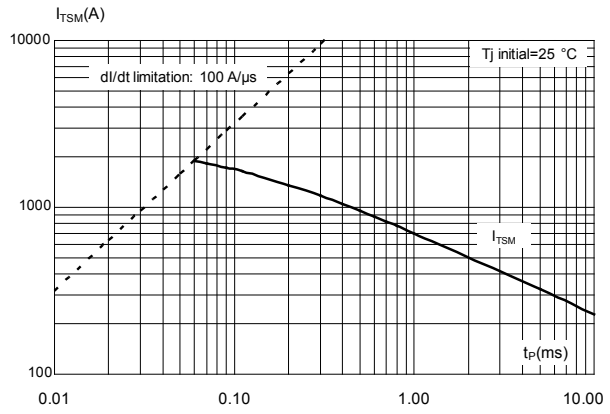


Figure 10. Relative variation of thermal impedance versus pulse duration

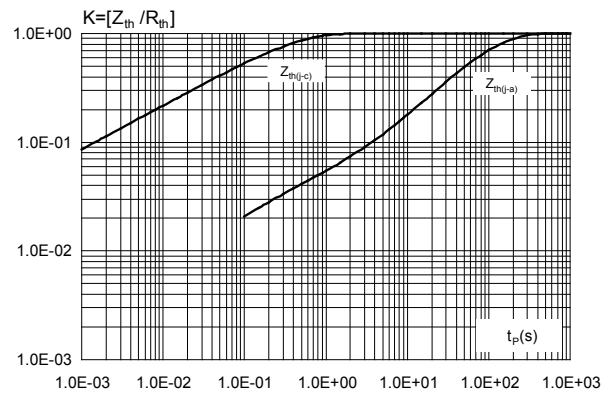
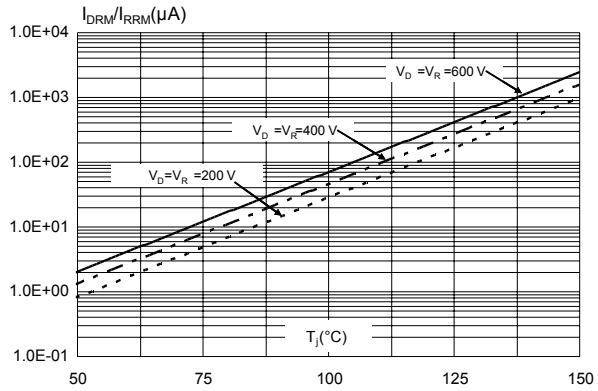


Figure 11. Leakage current versus junction temperature for different values of blocking voltage (typical values)



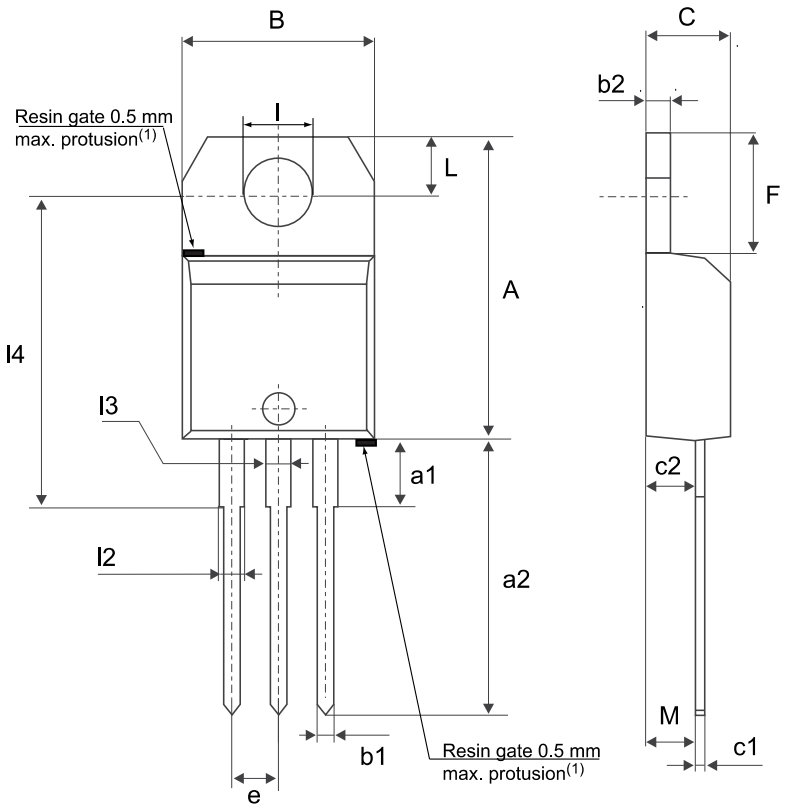
2 Package information

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. ECOPACK is an ST trademark.

2.1 TO-220AB Ins. 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 Insulated package outline



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

Table 5. TO-220AB Insulated package mechanical data

Ref.	Dimensions					
	Millimeters			Inches[1]		
	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
I	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**

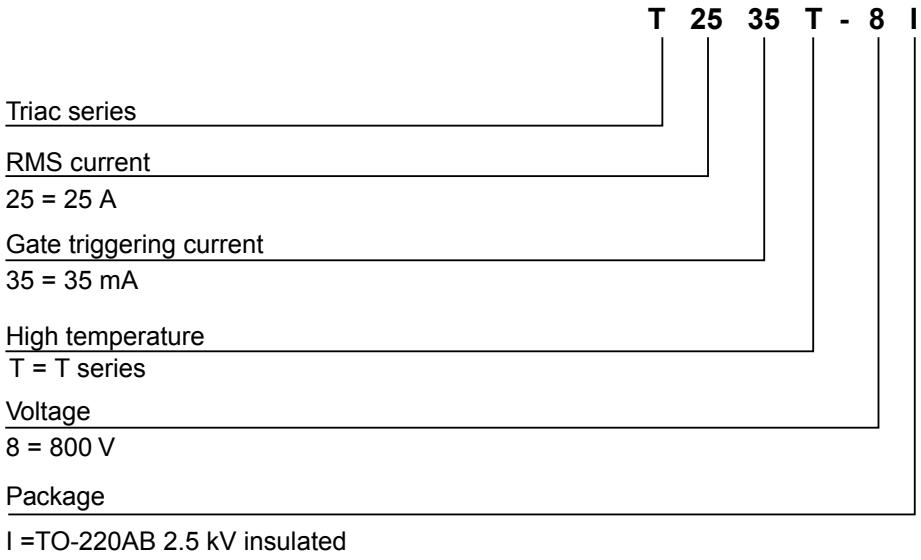


Table 6. **Ordering information**

Order code	Marking	Package	Weight	Base Qty.	Delivery mode
T2535T-8I	T2535T-8I	TO-220AB Ins.	2.3 g	50	Tube

Revision history

Table 7. **Document revision history**

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

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