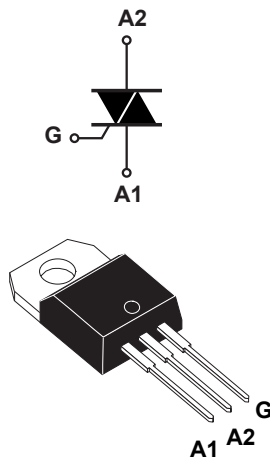


25 A - 800 V - T-series Triac in TO-220AB insulated



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) | | $T_c = 101\text{ °C}$ 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 |
| V_{INS} | Insulation RMS voltage, 1 minute | | 2.5 | kV |

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 Ω |
| I_{DRM}/I_{RRM} | $V_D = V_R = 800\text{ V}$, peak voltage | $T_j = 25\text{ }^\circ\text{C}$ | Max. | 5 | μA |
| | | $T_j = 125\text{ }^\circ\text{C}$ | | 5 | mA |
| | $V_D = V_R = 600\text{ V}$, peak voltage | $T_j = 150\text{ }^\circ\text{C}$ | Max. | 6 | mA |
| | $V_D = V_R = 400\text{ V}$, peak voltage | $T_j = 150\text{ }^\circ\text{C}$ | 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. | 1.7 | $^\circ\text{C/W}$ |
| $R_{th(j-a)}$ | Junction to ambient | Typ. | 60 | |

1.1 Characteristics (curves)

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

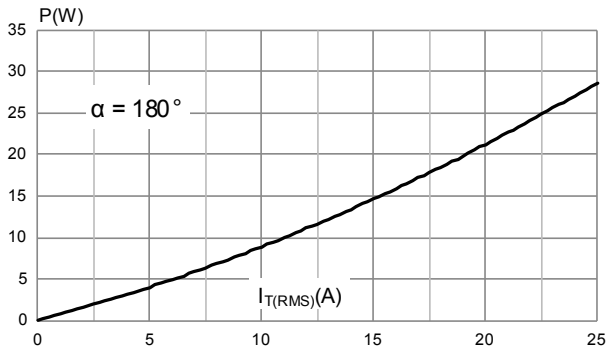


Figure 2. On-state RMS current cycle versus case temperature (full cycle)

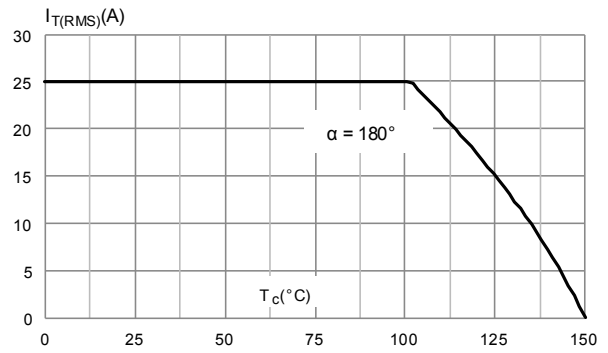


Figure 3. On-state RMS current versus ambient temperature (free air convection)

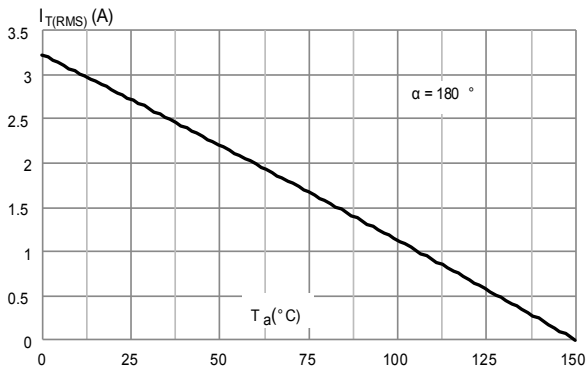


Figure 4. On-state characteristics (maximum)

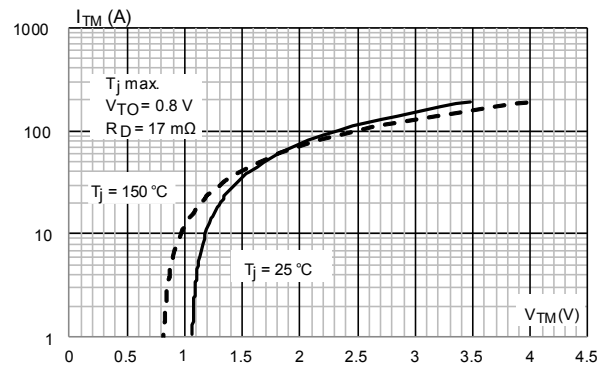


Figure 5. Relative variation of I_{GT}, I_H, I_L vs junction temperature (typical values)

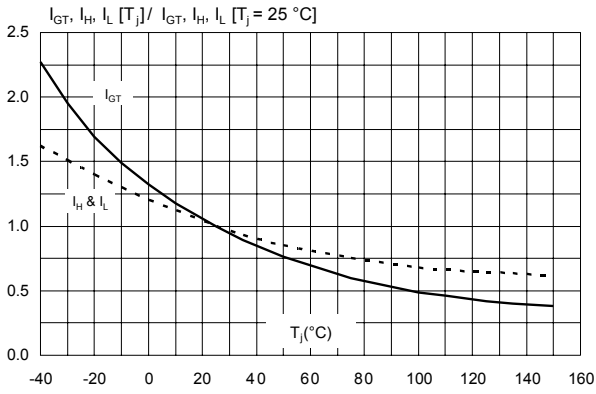


Figure 6. Relative variation of critical rate of decrease of main current versus junction temperature

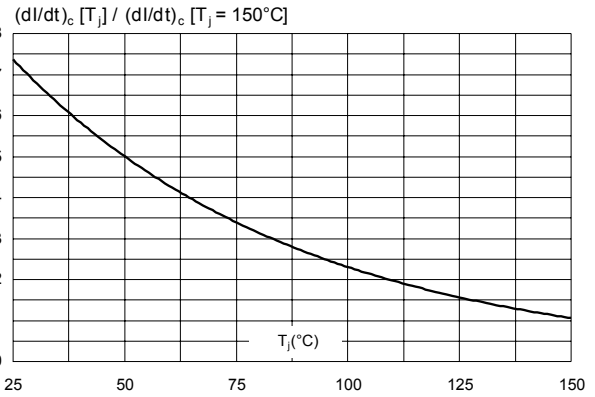


Figure 7. Relative variation of critical rate of decrease of current $(di/dt)_c$ versus reapplied $(dV/dt)_c$

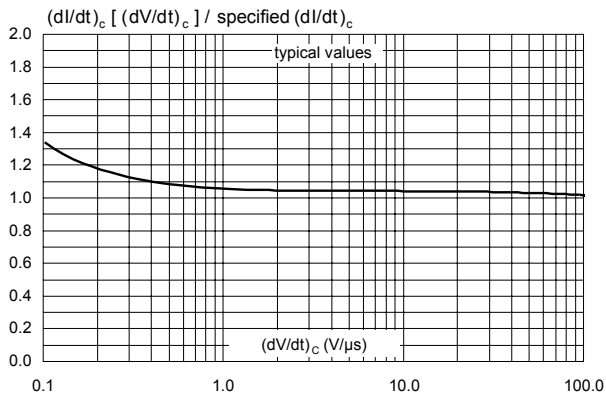


Figure 8. Surge peak on-state current versus number of cycles

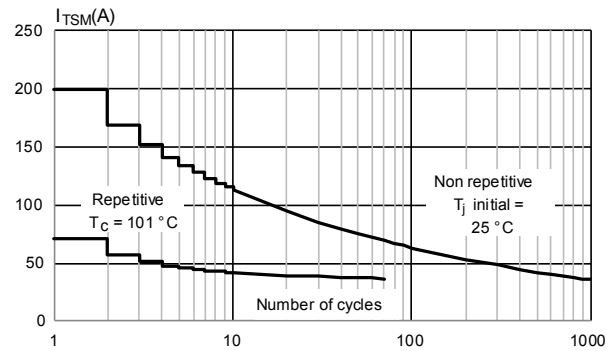


Figure 9. Non repetitive surge peak on-state current for a sinusoidal pulse width $t_p < 10$ ms

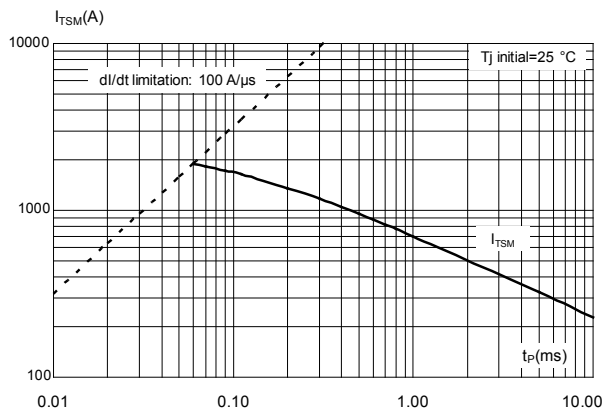


Figure 10. Relative variation of thermal impedance versus pulse duration

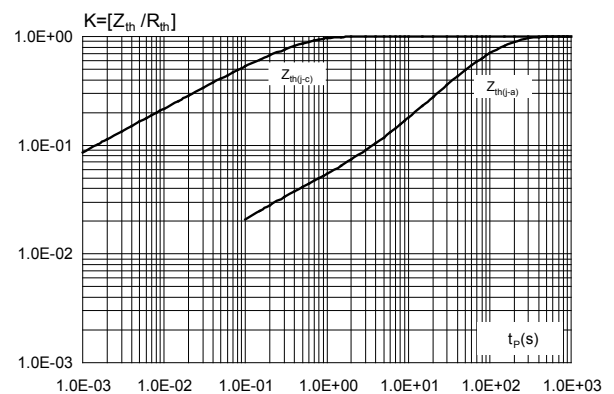
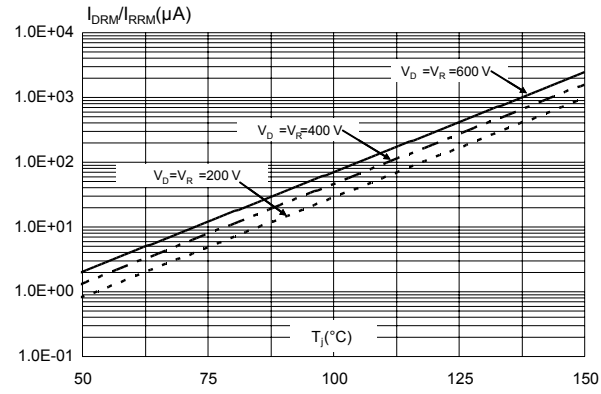


Figure 11. Leakage current versus junction temperature for different values of blocking voltage (typical values)



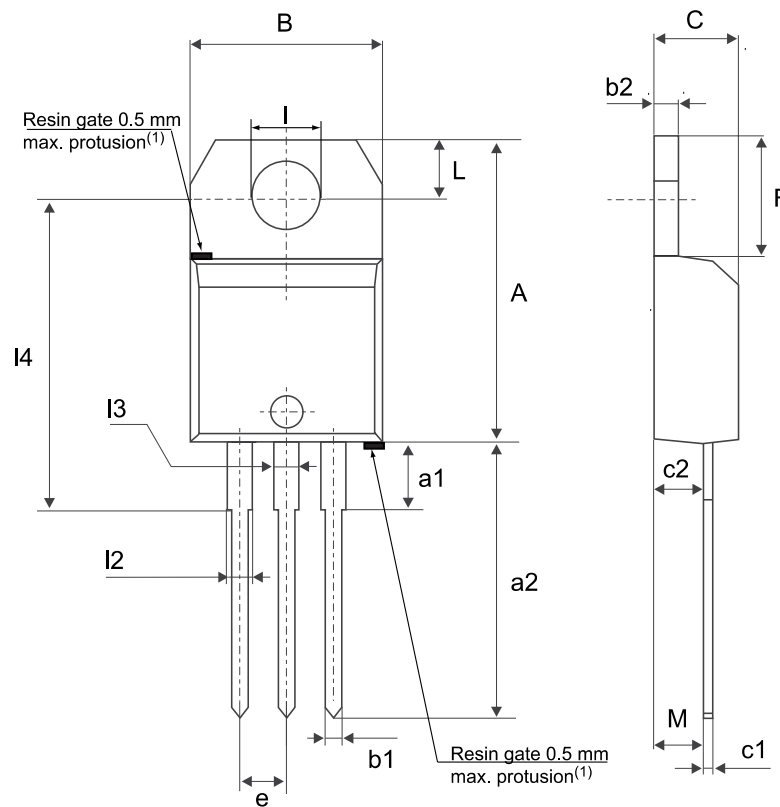
2 Package information

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. 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 |
| 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

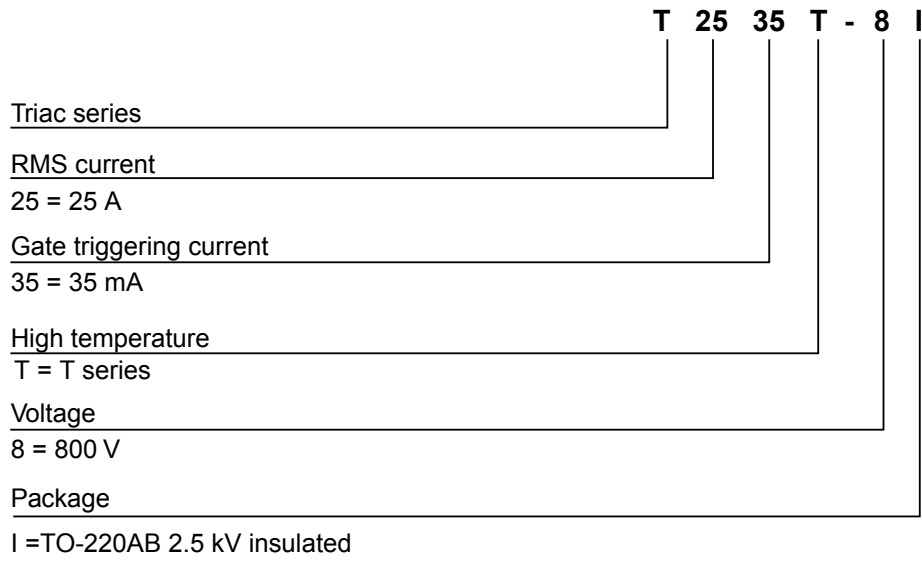


Table 6. Ordering information

| Order code | Marking | Package | Weight | Base Qty. | Delivery mode |
|------------|-----------|---------------|--------|-----------|---------------|
| T2535T-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. |