

## Bi-Directional Triode Thyristor

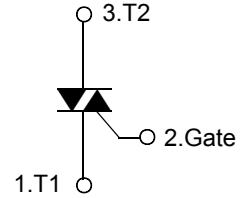
### Features

- ◆ Repetitive Peak Off-State Voltage : 600/800V
- ◆ R.M.S On-State Current (  $I_{T(RMS)} = 1\text{ A}$  )
- ◆ High Commutation  $dv/dt$

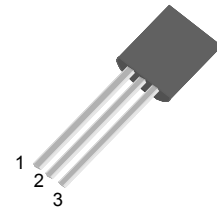
### General Description

This device is suitable for low power AC switching application, phase control application such as fan speed and temperature modulation control, lighting control and static switching relay.

Symbol



TO-92



### Absolute Maximum Ratings ( $T_J = 25^\circ\text{C}$ unless otherwise specified )

| Symbol       | Parameter                         | Condition                                  | Ratings    |     | Units                |
|--------------|-----------------------------------|--------------------------------------------|------------|-----|----------------------|
| $V_{DRM}$    | Repetitive Peak Off-State Voltage |                                            | 600        | 800 | V                    |
| $I_{T(RMS)}$ | R.M.S On-State Current            | $T_C = 58^\circ\text{C}$                   | 1.0        |     | A                    |
| $I_{TSM}$    | Surge On-State Current            | One Cycle, 50Hz/60Hz, Peak, Non-Repetitive | 9.1/10     |     | A                    |
| $I_t^2$      | $I_t^2$                           |                                            | 0.41       |     | $\text{A}^2\text{s}$ |
| $P_{GM}$     | Peak Gate Power Dissipation       |                                            | 1.0        |     | W                    |
| $P_{G(AV)}$  | Average Gate Power Dissipation    |                                            | 0.1        |     | W                    |
| $I_{GM}$     | Peak Gate Current                 |                                            | 0.5        |     | A                    |
| $V_{GM}$     | Peak Gate Voltage                 |                                            | 6.0        |     | V                    |
| $T_J$        | Operating Junction Temperature    |                                            | - 40 ~ 125 |     | $^\circ\text{C}$     |
| $T_{STG}$    | Storage Temperature               |                                            | - 40 ~ 150 |     | $^\circ\text{C}$     |
|              | Mass                              |                                            | 0.2        |     | g                    |

# STN1A60/80

## Electrical Characteristics

| Symbol                        | Items                                                  |                      | Conditions                                                                                      | Ratings |      |      | Unit |
|-------------------------------|--------------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------|---------|------|------|------|
|                               |                                                        |                      |                                                                                                 | Min.    | Typ. | Max. |      |
| I <sub>DRM</sub>              | Repetitive Peak Off-State Current                      |                      | V <sub>D</sub> = V <sub>DRM</sub> , Single Phase, Half Wave<br>T <sub>J</sub> = 125 °C          | -       | -    | 0.5  | mA   |
| V <sub>TM</sub>               | Peak On-State Voltage                                  |                      | I <sub>T</sub> = 1.5 A, Inst. Measurement                                                       | -       | -    | 1.6  | V    |
| I <sup>+</sup> <sub>GT1</sub> | I                                                      | Gate Trigger Current | V <sub>D</sub> = 6 V, R <sub>L</sub> =10 Ω                                                      | -       | -    | 5    | mA   |
| I <sup>-</sup> <sub>GT1</sub> | II                                                     |                      |                                                                                                 | -       | -    | 5    |      |
| I <sup>-</sup> <sub>GT3</sub> | III                                                    |                      |                                                                                                 | -       | -    | 5    |      |
| I <sup>+</sup> <sub>GT3</sub> | IV                                                     |                      |                                                                                                 | -       | 7    | 12   |      |
| V <sup>+</sup> <sub>GT1</sub> | I                                                      | Gate Trigger Voltage | V <sub>D</sub> = 6 V, R <sub>L</sub> =10 Ω                                                      | -       | -    | 1.8  | V    |
| V <sup>-</sup> <sub>GT1</sub> | II                                                     |                      |                                                                                                 | -       | -    | 1.8  |      |
| V <sub>GT3</sub>              | III                                                    |                      |                                                                                                 | -       | -    | 1.8  |      |
| V <sup>+</sup> <sub>GT3</sub> | IV                                                     |                      |                                                                                                 | -       | -    | 2.0  |      |
| V <sub>GD</sub>               | Non-Trigger Gate Voltage                               |                      | T <sub>J</sub> = 125 °C, V <sub>D</sub> = 1/2 V <sub>DRM</sub>                                  | 0.2     | -    | -    | V    |
| (dv/dt) <sub>c</sub>          | Critical Rate of Rise Off-State Voltage at Commutation |                      | T <sub>J</sub> = 125 °C, [di/dt] <sub>c</sub> = -0.5 A/ms, V <sub>D</sub> =2/3 V <sub>DRM</sub> | 2.0     | -    | -    | V/μs |
| I <sub>H</sub>                | Holding Current                                        |                      |                                                                                                 | -       | 4.0  | -    | mA   |
| R <sub>th(j-c)</sub>          | Thermal Resistance                                     |                      | Junction to case                                                                                | -       | -    | 50   | °C/W |
| R <sub>th(j-a)</sub>          | Thermal Resistance                                     |                      | Junction to Ambient                                                                             | -       | -    | 120  | °C/W |

Fig 1. Gate Characteristics

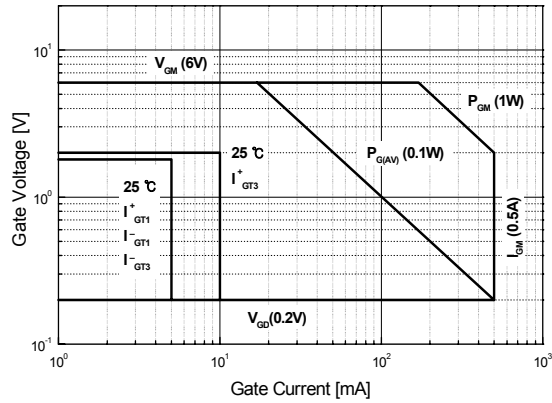


Fig 2. On-State Voltage

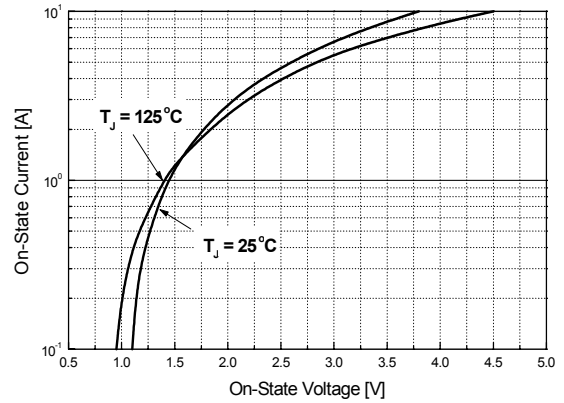


Fig 3. On State Current vs. Maximum Power Dissipation

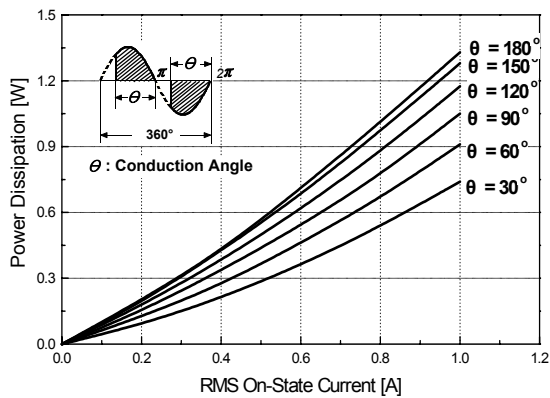


Fig 4. On State Current vs. Allowable Case Temperature

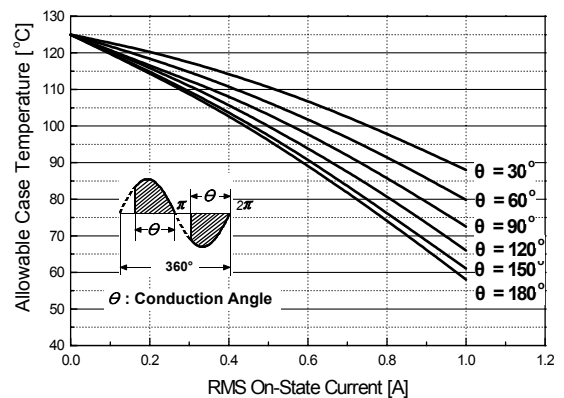


Fig 5. Surge On-State Current Rating ( Non-Repetitive )

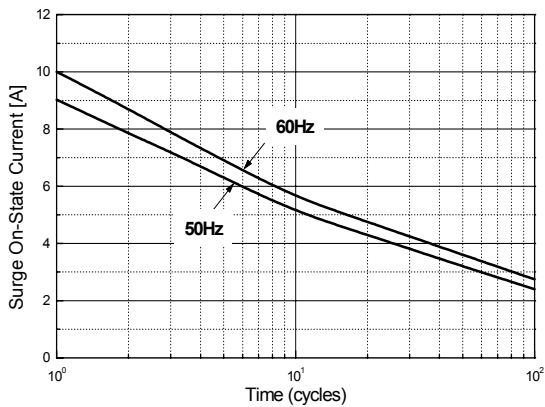
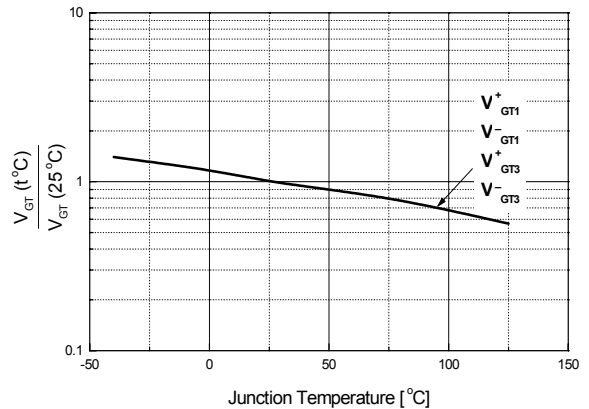
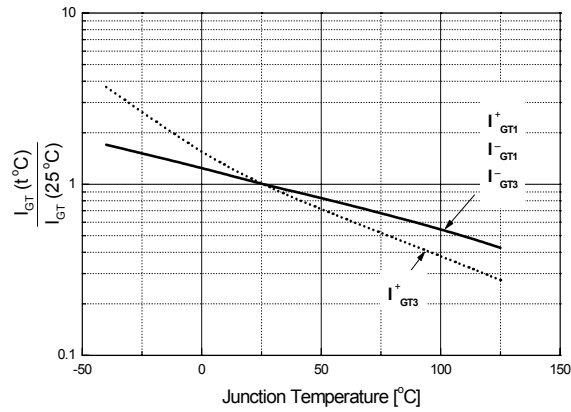


Fig 6. Gate Trigger Voltage vs. Junction Temperature

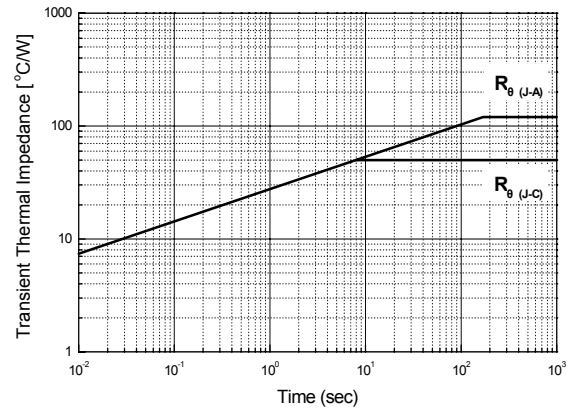


# STN1A60/80

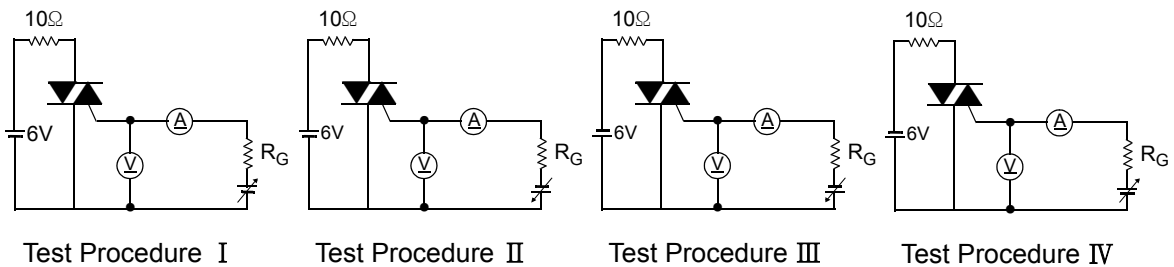
**Fig 7. Gate Trigger Current vs. Junction Temperature**



**Fig 8. Transient Thermal Impedance**



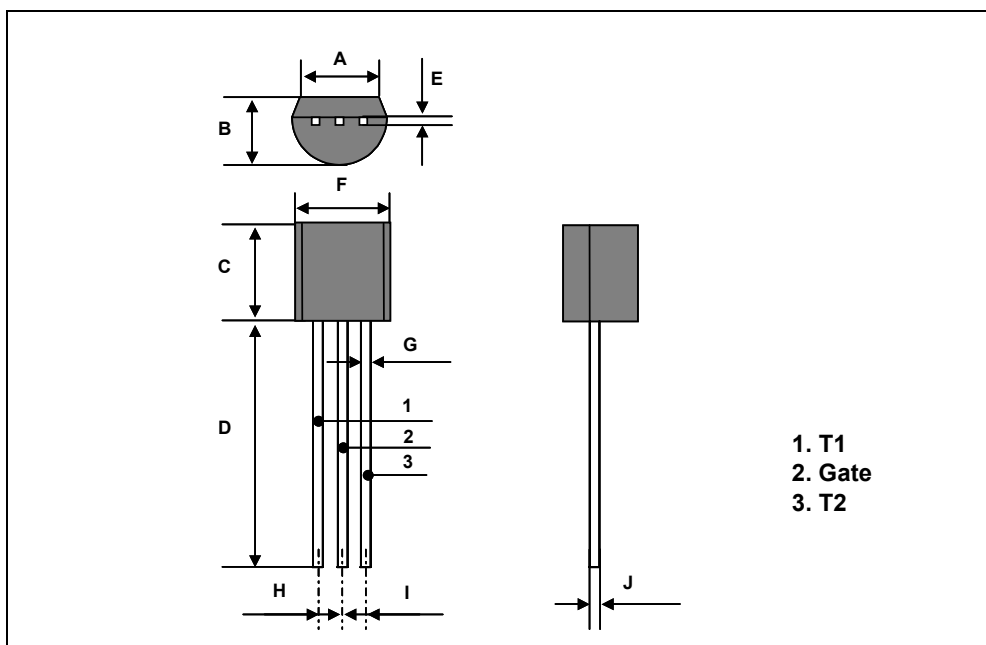
**Fig 9. Gate Trigger Characteristics Test Circuit**



# STN1A60/80

## TO-92 Package Dimension

| Dim. | mm    |      |       | Inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | Min.  | Typ. | Max.  | Min.  | Typ.  | Max.  |
| A    |       | 4.2  |       |       | 0.165 |       |
| B    |       |      | 3.7   |       |       | 0.146 |
| C    | 4.43  |      | 4.83  | 0.174 |       | 0.190 |
| D    | 14.07 |      | 14.87 | 0.554 |       | 0.585 |
| E    |       |      | 0.4   |       |       | 0.016 |
| F    | 4.43  |      | 4.83  | 0.174 |       | 0.190 |
| G    |       |      | 0.45  |       |       | 0.017 |
| H    |       | 2.54 |       |       | 0.100 |       |
| I    |       | 2.54 |       |       | 0.100 |       |
| J    | 0.33  |      | 0.48  | 0.013 |       | 0.019 |



# STN1A60/80

## TO-92 Package Dimension, Forming

| Dim. | mm    |      |       | Inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | Min.  | Typ. | Max.  | Min.  | Typ.  | Max.  |
| A    |       | 4.2  |       |       | 0.165 |       |
| B    |       |      | 3.7   |       |       | 0.146 |
| C    | 4.43  |      | 4.83  | 0.174 |       | 0.190 |
| D    | 14.07 |      | 14.87 | 0.554 |       | 0.585 |
| E    |       |      | 0.4   |       |       | 0.016 |
| F    | 4.43  |      | 4.83  | 0.174 |       | 0.190 |
| G    |       |      | 0.45  |       |       | 0.017 |
| H    |       | 2.54 |       |       | 0.100 |       |
| I    |       | 2.54 |       |       | 0.100 |       |
| J    | 0.33  |      | 0.48  | 0.013 |       | 0.019 |
| K    | 4.5   |      | 5.5   | 0.177 |       | 0.216 |
| L    | 7.8   |      | 8.2   | 0.295 |       | 0.323 |
| M    | 1.8   |      | 2.2   | 0.070 |       | 0.086 |
| N    | 1.3   |      | 1.7   | 0.051 |       | 0.067 |

