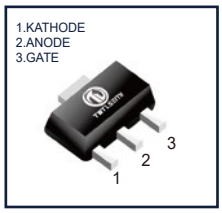
# TL-BT169

SOT-89-3L Silicon Controlled Rectifiers

## Features

- Repetitive Peak Off-State Voltage : 600V
- R.M.S On-State Current ( $I_{T(RMS)}$= 0.8 A )
- Low On-State Voltage (1.2V(Typ.)@ $I_{TM}$)
- Available with tape & reel




SOT-89-3L


Equivalent Circuit

## General Description

Sensitive triggering SCR is suitable for the application where gate current limited such as small motor control, gate driver for large SCR, sensing and detecting circuits.

## Absolute Maximum Ratings ($T_A$=25℃ unless otherwise noted)

| Symbol | Parameter | Condition | Ratings | Units |
|---|---|---|---|---|
| $V_{DRM}$ | Repetitive Peak Off-State Voltage | | 600 | V |
| $I_{T(AV)}$ | Average On-State Current | Half Sine Wave : $T_C$ = 112 ℃ | 0.5 | A |
| $I_{T(RMS)}$ | R.M.S On-State Current | All Conduction Angle | 0.8 | A |
| $I_{TSM}$ | Surge On-State Current | 1/2 Cycle, 60Hz, Sine Wave Non-Repetitive | 10 | A |
| $I^2t$ | $I^2t$ for Fusing | t = 8.3ms | 0.415 | $A^2s$ |
| $P_{GM}$ | Forward Peak Gate Power Dissipation | | 2 | W |
| $P_{G(AV)}$ | Forward Average Gate Power Dissipation | | 0.1 | W |
| $I_{FGM}$ | Forward Peak Gate Current | | 1 | A |
| $V_{RGM}$ | Reverse Peak Gate Voltage | | 5.0 | V |
| $T_J$ | Operating Junction Temperature | | -40 ~ 125 | ℃ |
| $T_{STG}$ | Storage Temperature | | -40 ~ 150 | ℃ |

## Ordering information

| Product ID | Marking | Naming rule | Pack | Qty(PCS) |
|---|---|---|---|---|
| BT169 | BT169 | BT169<br>产品名称<br>product name | SOT-89-3L | 1000 |

## Electrical Characteristics ($T_A$=25℃, unless otherwise noted)

| Symbol | Items | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $I_{DRM}$ | Repetitive Peak Off-State Current | $V_{AK}$=$V_{DRM}$ or $V_{RRM}$ ; $R_{GK}$=1000 Ω<br>$T_C$=25 °C<br>$T_C$=125 °C | —<br>— | —<br>— | 10<br>200 | μA |
| $V_{TM}$ | Peak On-State Voltage (1) | ( $I_{TM}$ = 1 A, Peak ) | — | 1.2 | 1.7 | V |
| $I_{GT}$ | Gate Trigger Current (2) | $V_{AK}$=6V, $R_L$=100Ω<br>$T_C$=25 °C<br>$T_C$=-40 °C | —<br>— | —<br>— | 200<br>500 | μA |
| $V_{GT}$ | Gate Trigger Voltage (2) | $V_D$=7V, $R_L$=100Ω<br>$T_C$=25 °C<br>$T_C$=-40 °C | —<br>— | —<br>— | 0.8<br>1.2 | V |
| $V_{GD}$ | Non-Trigger Gate Voltage (1) | $V_{AK}$=12V, $R_L$=100Ω $T_C$=125 °C | 0.2 | — | — | V |
| dv/dt | Critical Rate of Rise Off-State Voltage | $V_D$=Rated $V_{DRM}$ , Exponential wave-form , $R_{GK}$=1000Ω<br>$T_J$=125 °C | 500 | 800 | — | V/μA |
| di/dt | Critical Rate of Rise On-State Current | $I_{PK}$=20A ; $P_W$=10μA ; $di_G/dt$=1A/μA<br>$I_{gt}$=20mA | — | — | 50 | A/μA |
| $I_H$ | Holding Current | $V_{AK}$=12 V, Gate Open<br>Initiating Curent=20mA<br>$T_C$=25 °C<br>$T_C$=-40 °C | —<br>— | 2<br>— | 5.0<br>10 | mA |
| $R_{th(j-c)}$ | Thermal Impedance | Junction to case | — | — | 15 | °C/W |
| $R_{th(j-a)}$ | Thermal Impedance | Junction to Ambient | — | — | 125 | °C/W |

※ Notes :

1. Pulse Width ≤ 1.0 ms , Duty cycle ≤ 1%
2.Does not include RGK in measurement.

## Typical Characteristics

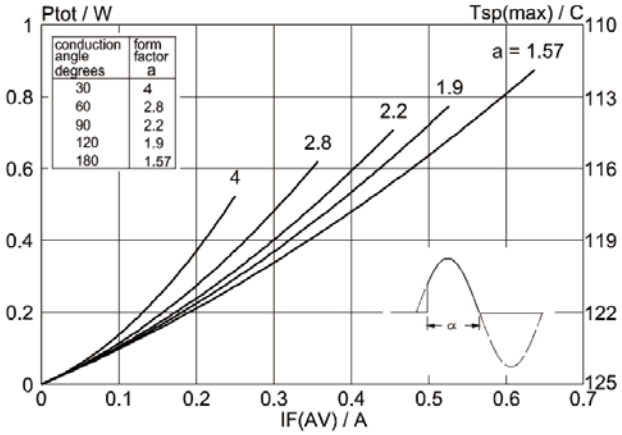



*Fig.1. Maximum on-state dissipation, $P_{tot}$, versus average on-state current, $I_{T(AV)}$, where a = form factor = $I_{T(RMS)}/I_{T(AV)}$.*

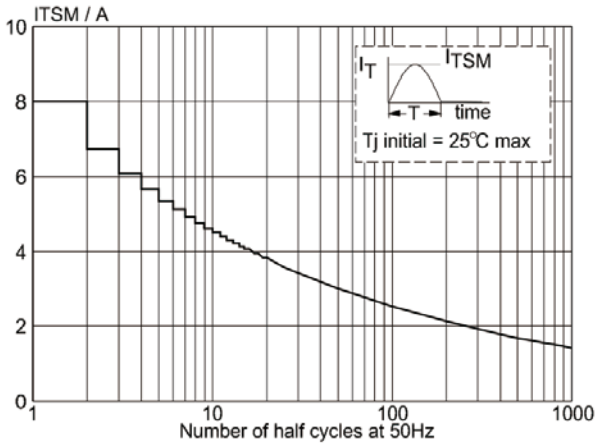



*Fig.4. Maximum permissible non-repetitive peak on-state current $I_{TSM}$, versus number of cycles, for sinusoidal currents, f = 50 Hz.*

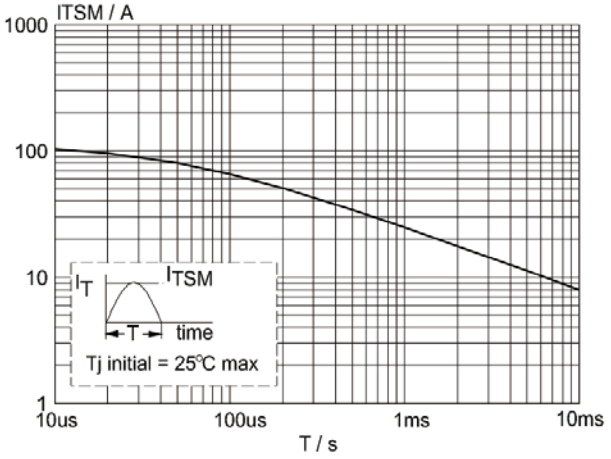



*Fig.2. Maximum permissible non-repetitive peak on-state current $I_{TSM}$, versus pulse width $t_p$, for sinusoidal currents, $t_p \leq 10ms$.*

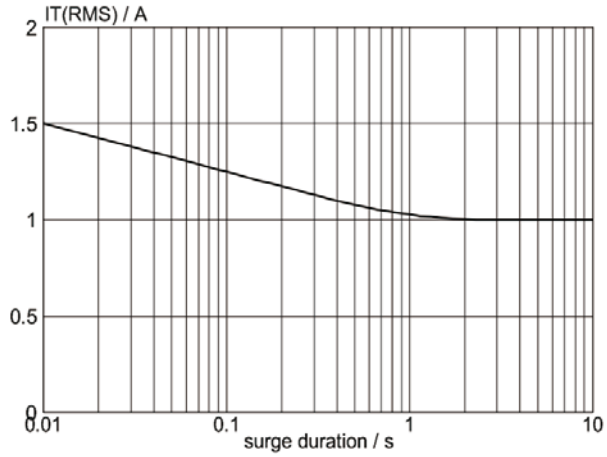



*Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{sp} \leq 112^{\circ}C$.*

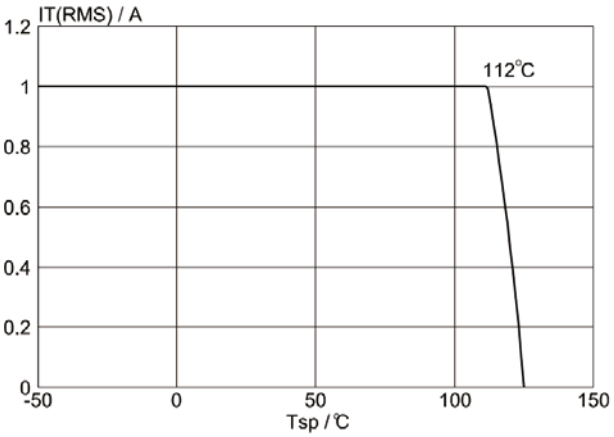



*Fig.3. Maximum permissible rms current $I_{T(RMS)}$, versus solder point temperature $T_{sp}$.*

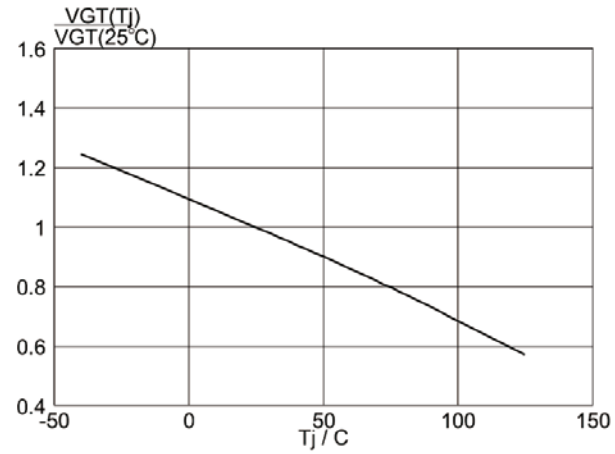



*Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/ V_{GT}(25^{\circ}C)$, versus junction temperature $T_j$.*

## Typical Characteristics

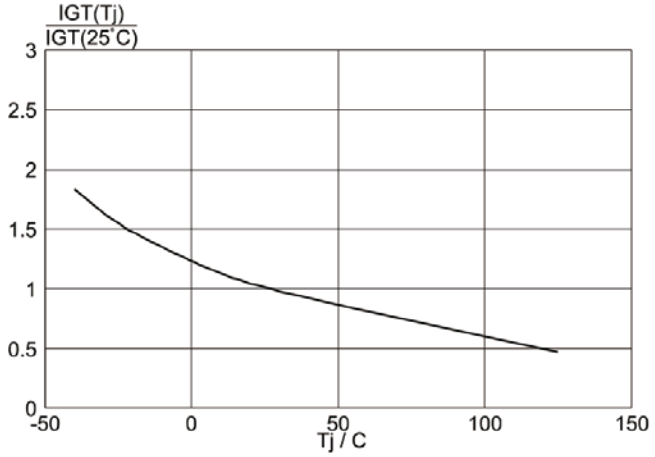



*Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25^{\circ}C)$, versus junction temperature $T_j$.*

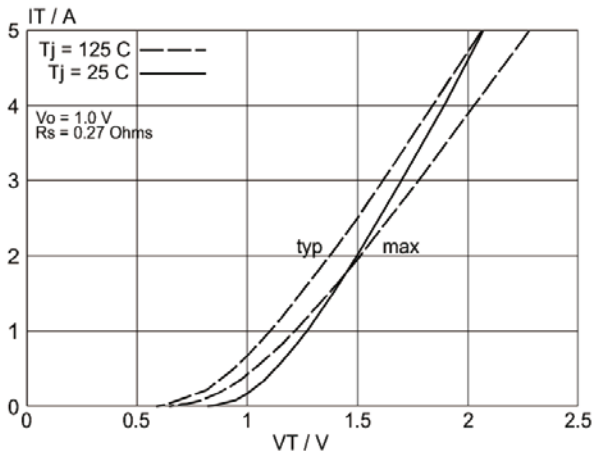



*Fig.10. Typical and maximum on-state characteristic.*

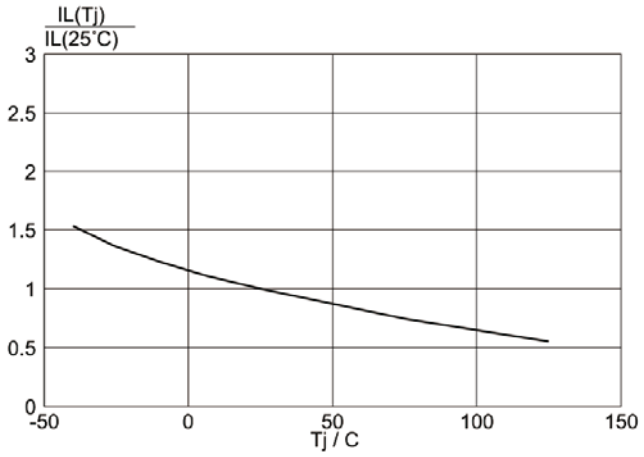



*Fig.8. Normalised latching current $I_L(T_j)/ I_L(25^{\circ}C)$, versus junction temperature $T_j$, $R_{GK}$ = 1 kΩ.*

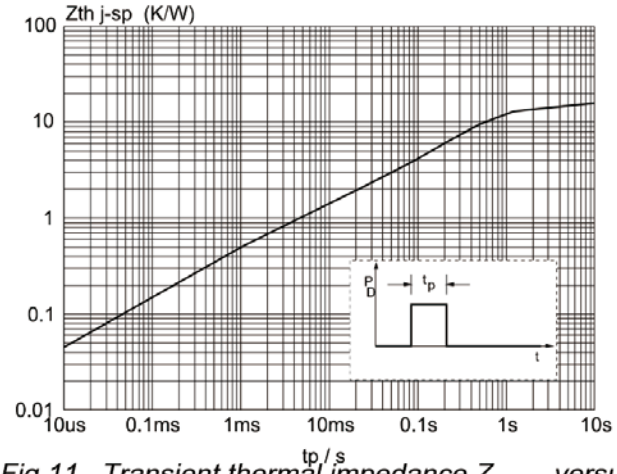



*Fig.11. Transient thermal impedance $Z_{th\ j\text{-}sp}$, versus pulse width $t_p$.*

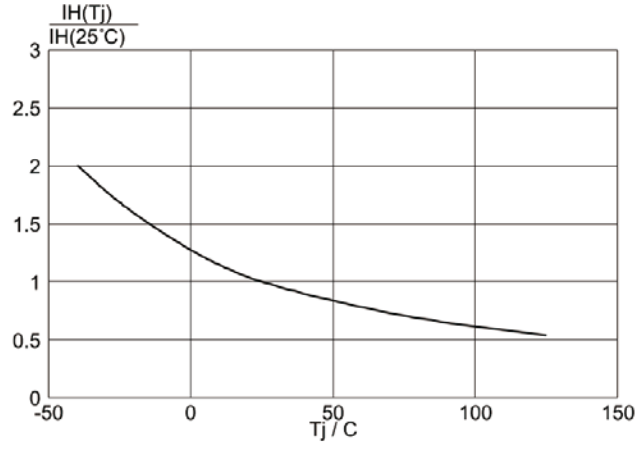



*Fig.9. Normalised holding current $I_H(T_j)/ I_H(25^{\circ}C)$, versus junction temperature $T_j$, $R_{GK}$ = 1 kΩ.*

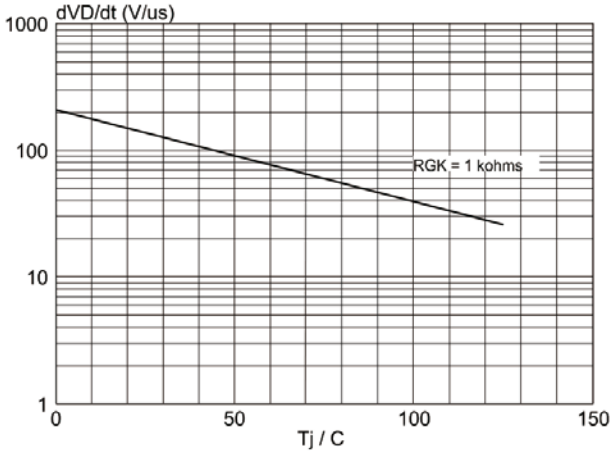
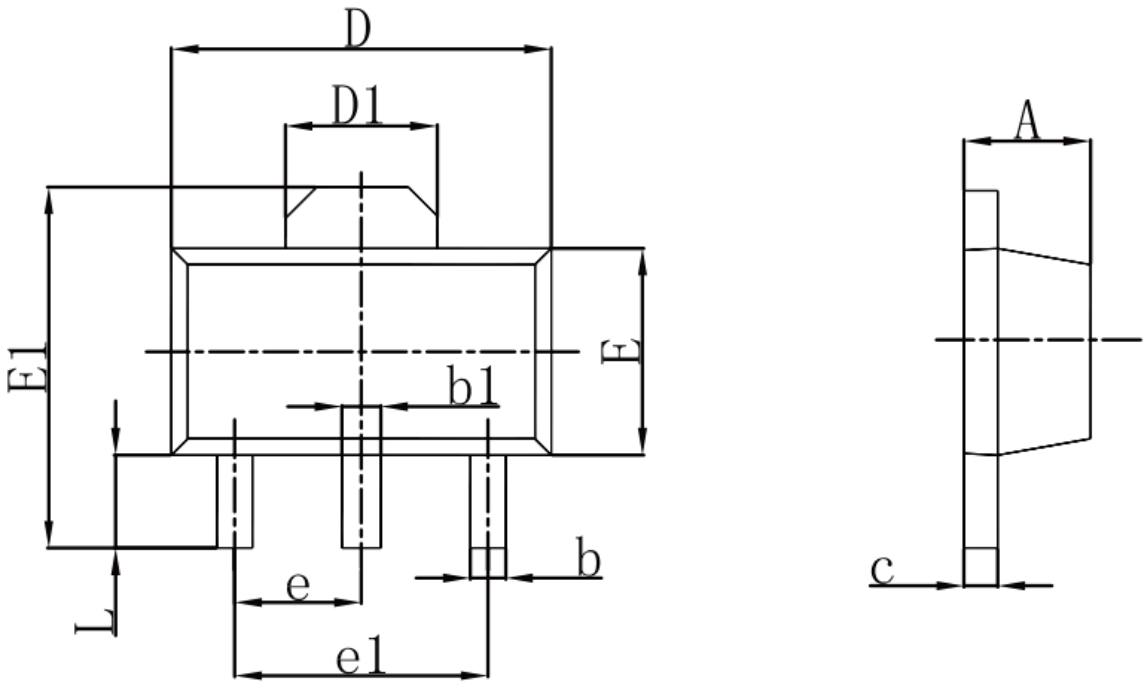



*Fig.12. Typical, critical rate of rise of off-state voltage, $dV_D/dt$ versus junction temperature $T_j$.*

## SOT-89-3L Package Outline Dimensions




| Symbol | Dimensions in Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF. | | 0.061 REF. | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP. | | 0.060 TYP. | |
| e1 | 3.000 TYP. | | 0.118 TYP. | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |