



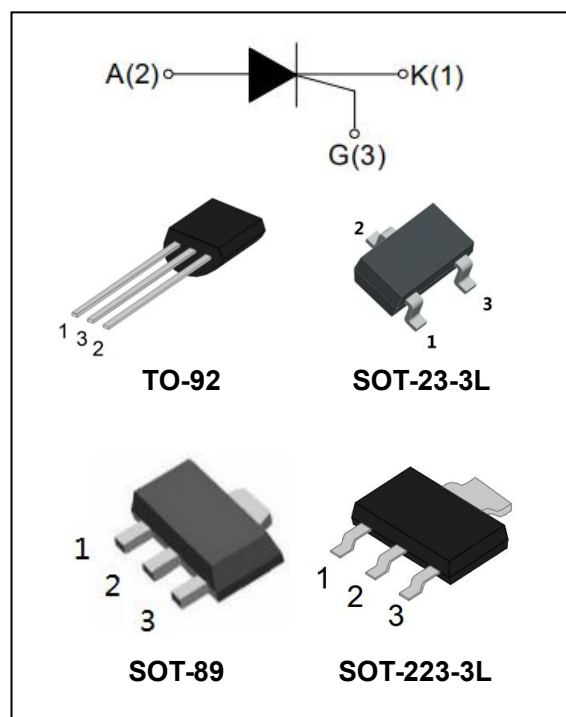
BT169 Series 1A Sensitive SCRs

DESCRIPTION:

The BT169 SCR series provide high dv/dt rate with strong resistance to electromagnetic interference. They are especially recommended for use on residual current circuit breaker, straight hair, igniter etc.

MAIN FEATURES:

| symbol | value | unit |
|-------------------|------------|------|
| $I_{T(RMS)}$ | 1 | A |
| V_{DRM}/V_{RRM} | 600 | V |
| V_{TM} | ≤ 1.5 | V |



ABSOLUTE MAXIMUM RATINGS:

| Parameter | Symbol | Value | Unit |
|---|--------------|---------|-------------|
| Storage junction temperature range | T_{stg} | -40~150 | $^{\circ}C$ |
| Operating junction temperature range | T_j | -40~110 | $^{\circ}C$ |
| Repetitive peak off-state voltage ($T_j=25^{\circ}C$) | V_{DRM} | 600 | V |
| Repetitive peak reverse voltage ($T_j=25^{\circ}C$) | V_{RRM} | 600 | V |
| RMS on-state current | $I_{T(RMS)}$ | 1 | A |
| Non repetitive surge peak on-state current (full cycle, $F=50Hz$) | I_{TSM} | 10 | A |
| I^2t value for fusing ($t_p=10ms$) | I^2t | 0.50 | A^2s |
| Critical rate of rise of on-state current ($I_G=2 \times I_{GT}$) | di/dt | 50 | $A/\mu s$ |
| Peak gate current | I_{GM} | 0.2 | A |
| Average gate power dissipation | $P_{G(AV)}$ | 0.1 | W |
| Peak gate power | P_{GM} | 0.5 | W |



ELECTRICAL CHARACTERISTICS ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

| Symbol | Test Condition | Value | | | Unit |
|----------|--|-------|------|-----|------------------|
| | | MIN | TYPE | MAX | |
| I_{GT} | $V_D=12\text{V}, R_L=33\Omega$ | - | 20 | 200 | μA |
| V_{GT} | | - | 0.6 | 0.8 | V |
| V_{GD} | $V_D=V_{DRM}, T_j=110^{\circ}\text{C}$ $R_L=3.3\text{k}\Omega$ | 0.2 | - | - | V |
| I_H | $I_T=50\text{mA}$ | - | - | 5 | mA |
| I_L | $I_G=1.2I_{GT}$ | - | - | 6 | mA |
| dV/dt | $V_D=0.66 \times V_{DRM}, T_j=110^{\circ}\text{C}$ G 极开路 $R_{GK}=1\text{k}\Omega$ | 10 | - | - | V/ μs |

STATIC CHARACTERISTICS

| Symbol | Test Condition | | Value | Unit |
|------------------------|---|---------------------------|-------|----------------------|
| V_{TM} | $I_{TM}=1.5\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$ | MAX | 1.5 V |
| I_{DRM} I_{RRM} | $V_{DRM}=V_{RRM}$ $R_{GK}=1\text{k}\Omega$ | $T_j=25^{\circ}\text{C}$ | MAX | 5 μA |
| | | $T_j=110^{\circ}\text{C}$ | | 100 μA |

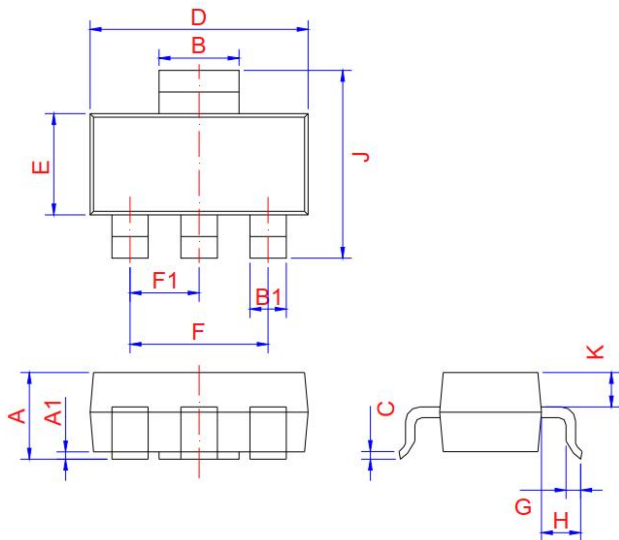
THERMAL RESISTANCES

| Symbol | Test Condition | | Value | Unit |
|---------------|----------------|-----------|-------|-----------------------------|
| $R_{th(j-c)}$ | 结到外壳(AC) | SOT-223 | 31 | $^{\circ}\text{C}/\text{W}$ |
| | | TO-92 | 75 | |
| | | SOT-23-3L | | |
| | | SOT-89 | 45 | |



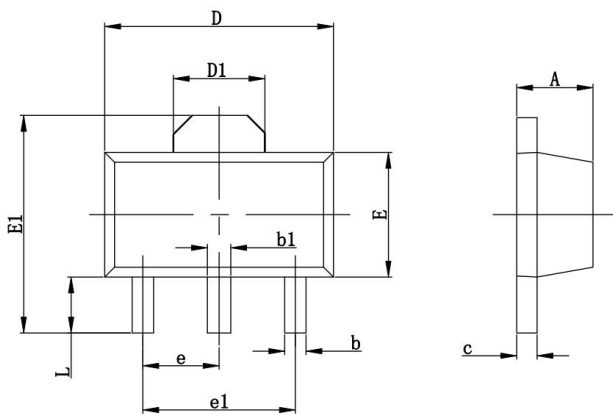
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PACKAGE MECHANICAL DATA



SOT-223-3L

| Ref. | Dimensions | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 1.5 | 1.6 | 1.8 | 0.059 | 0.063 | 0.071 |
| A1 | 0.01 | 0.06 | 0.10 | 0.001 | 0.002 | 0.004 |
| B | 2.9 | 3.0 | 3.1 | 0.114 | 0.118 | 0.122 |
| B1 | 0.6 | 0.7 | 0.8 | 0.024 | 0.028 | 0.031 |
| C | 0.22 | 0.25 | 0.32 | 0.009 | 0.010 | 0.013 |
| D | 6.3 | 6.5 | 6.7 | 0.248 | 0.256 | 0.264 |
| E | 3.3 | 3.5 | 3.7 | 0.130 | 0.138 | 0.146 |
| F | | 4.6 | 6.8 | 0.252 | 0.181 | |
| F1 | | 2.3 | | | 0.091 | |
| G | 0.7 | 0.9 | 1.1 | 0.028 | 0.035 | 0.043 |
| H | 1.5 | 1.75 | 2.0 | 0.059 | 0.069 | 0.079 |
| J | 6.7 | 7.0 | 7.3 | 0.264 | 0.276 | 0.287 |
| K | 0.8 | 0.9 | 1.0 | 0.031 | 0.035 | 0.039 |

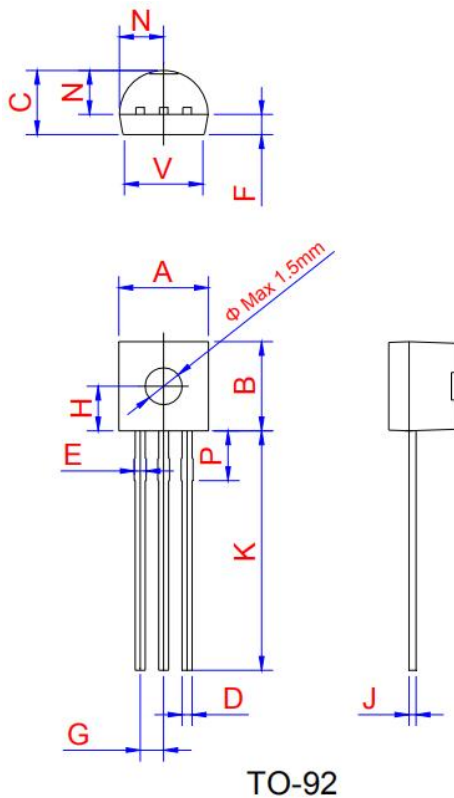


SOT-89-3L

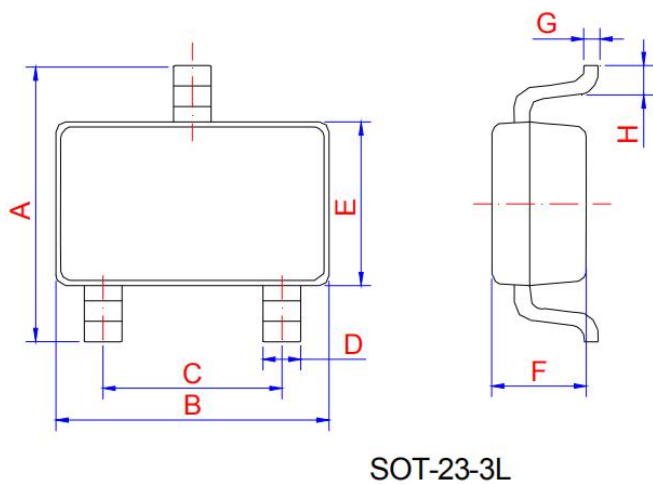
| Ref. | Dimensions | | | | | |
|------|-------------|-------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 1.4 | | 1.6 | 0.055 | | 0.063 |
| b | 0.35 | | 0.52 | 0.013 | | 0.197 |
| b1 | 0.4 | | 0.58 | 0.016 | | 0.023 |
| c | 0.35 | | 0.44 | 0.014 | | 0.017 |
| D | 4.4 | | 4.6 | 0.173 | | 0.181 |
| D1 | | 1.55 | | | 0.061 | |
| E | 2.35 | | 2.55 | 0.091 | | 0.102 |
| E1 | 3.94 | | 4.25 | 0.155 | | 0.167 |
| e | | 1.500 | | | 0.060 | |
| e1 | | 3.000 | | | 0.118 | |
| L | 0.9 | | 1.1 | 0.035 | | 0.047 |



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| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.45 | 4.6 | 5.2 | 0.175 | 0.181 | 0.205 |
| B | 4.32 | 4.6 | 5.33 | 0.17 | 0.181 | 0.21 |
| C | 3.18 | 3.55 | 4.19 | 0.125 | 0.14 | 0.165 |
| D | 0.407 | | 0.533 | 0.016 | | 0.021 |
| E | 0.6 | | 0.8 | 0.024 | 0 | 0.031 |
| F | - | 1.1 | - | - | 0.043 | - |
| G | - | 1.27 | - | - | 0.05 | - |
| H | - | 2.3 | - | - | 0.091 | - |
| J | 0.36 | 0.38 | 0.5 | 0.014 | 0.015 | 0.02 |
| K | 12.7 | | 15 | 0.5 | | 0.591 |
| N | 2.04 | 2.3 | 2.66 | 0.08 | 0.091 | 0.105 |
| P | 1.86 | | 2.06 | 0.073 | | 0.081 |
| V | - | | 4.3 | - | | 0.169 |



| Ref. | Dimensions | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.65 | 2.8 | 2.95 | 0.104 | 0.11 | 0.116 |
| B | 2.82 | 2.92 | 3.02 | 0.111 | 0.115 | 0.119 |
| C | 1.8 | 1.9 | 2 | 0.071 | 0.075 | 0.079 |
| D | 0.3 | 0.35 | 0.5 | 0.012 | 0.014 | 0.02 |
| E | 1.5 | 1.6 | 1.7 | 0.059 | 0.063 | 0.067 |
| F | 1.07 | 1.17 | 1.27 | 0.042 | 0.046 | 0.05 |
| G | 0.05 | 0.15 | 0.25 | 0.002 | 0.006 | 0.01 |
| H | 0.25 | 0.4 | 0.55 | 0.01 | 0.016 | 0.022 |



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FIG.1: Maximum power dissipation versus RMS on-state current

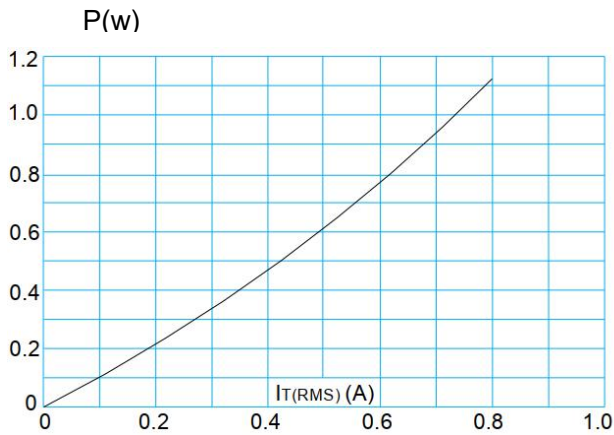


FIG.2: RMS on-state current versus case temperature

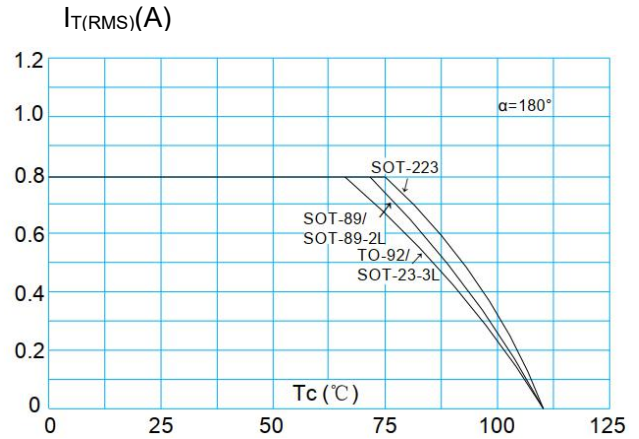


FIG.3: Surge peak on-state current versus number of cycles

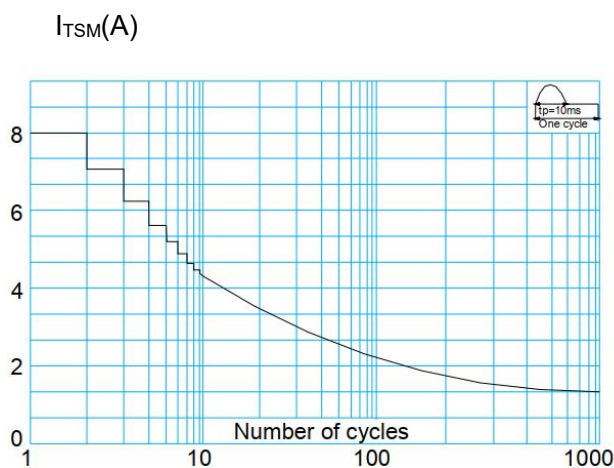


FIG.4: On-state characteristics (maximum values)

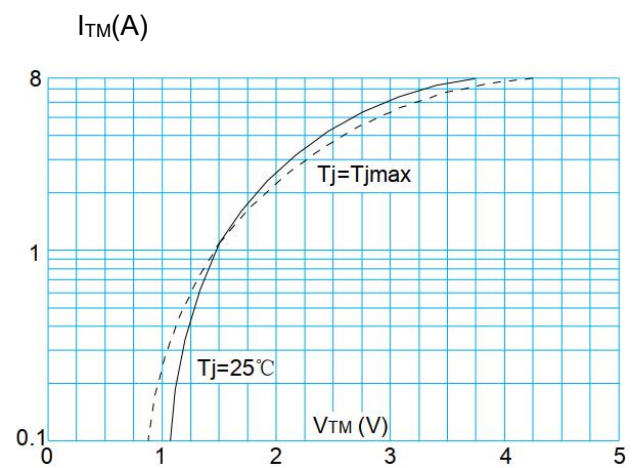


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of $I^2 t$ ($di/dt < 50\text{A}/\mu\text{s}$)

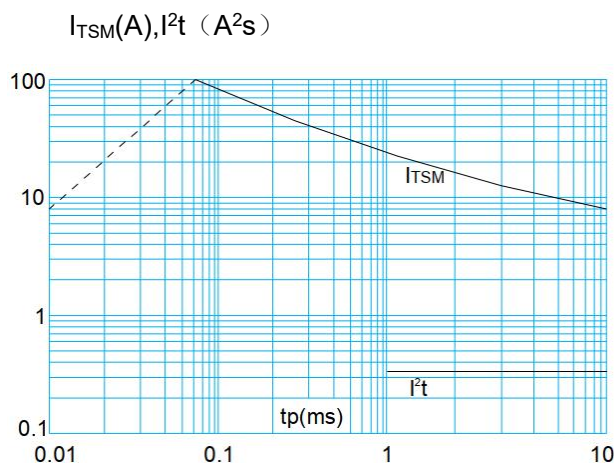
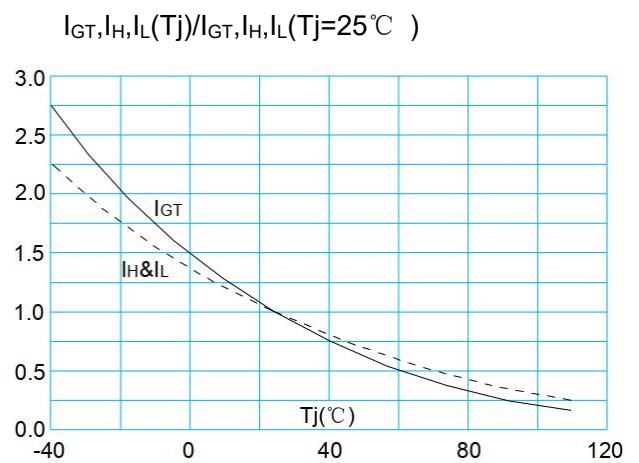


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature





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