# Product Manual

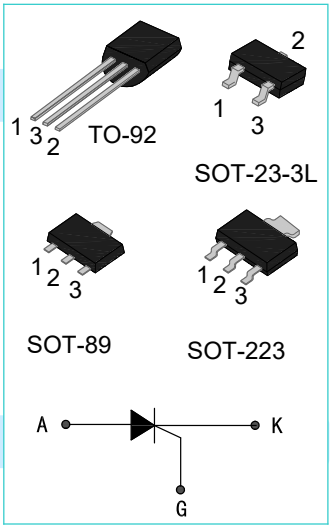
EKWIN ELECTRONICS CO.,LTD

**EK BT169**

www.ekwin.net

# 0.8A SCRs

## BT169 Serial




## Main Features:

| IT(RMS) | VDRM/VRRM | IGT |
|---|---|---|
| 0.8A | 600 V | ≤200uA |

## Description:

High sensitive triggering levels.The BT169 Series SCRs is suitable for all applications, where the available gate cuttent is limited,such as capacitive discharge ignitions,motor contol in kitchen aids,overvoltage crowbar protection in low power supplies...

## Absolute Ratings(limiting values) :

| Symbol | Parameter | | value | Unit |
|---|---|---|---|---|
| $I_{T(RMS)}$ | on-state RMS current (180°C conduction angle) | SOT-23-3L/TO-92 (TC=50℃) | 0.8 | A |
| | | SOT-223(TC=70℃) | | |
| | | SOT-89-2L(TC=61℃) | | |
| $I_{TSM}$ | Non repetitive surge peak on-state current (Tj= 25 ˚C) | tp= 8.3 ms | 9 | A |
| | | tp = 10 ms | 8 | |
| $V_{DRM}$ | Repetitive peak off-state voltage(Tj =25℃) | | 600 | V |
| $V_{RRM}$ | Repetitive peak reverse voltage(Tj =25℃) | | 600 | V |
| Tstg<br>Tj | Storage and operating junction temperature range | | - 40 to + 150<br>- 40 to + 110 | °C |
| $I^2t$ | $I^2t$ value for fusing $T_j$ = 125°C | tp = 10 ms | 0.32 | $A^2s$ |
| $d_I/d_t$ | Critical rate of rise of on-state current $I_G$=2x$I_{GT}$, tr≤100ns | | 50 | A/µs |
| IGM | Peak gate current tp=20us Tj=125℃ | | 0.2 | A |
| PGM | Peak gate power tp=20us Tj=125℃ | | - | W |
| PG(av) | Average gate power dissipation Tj=125℃ | | 0.1 | W |

## Electrical Characteristics :

| Symbol | Test Condition | | range | Value | Unit |
|---|---|---|---|---|---|
| $I_{GT}$ | $V_D$=6V $R_L$=100Ω | $T_j$=25°C | MAX | 200 | uA |
| $V_{GT}$ | | $T_j$=25°C | MAX | 0.8 | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $R_L$=3.3kΩ | $T_j$=125°C | MIN | 0.2 | V |
| $t_{gt}$ | $V_D$=$V_{DRM}$ $I_G$= 500uA dIG/dt = 0.2A/μs | $T_j$=25°C | TYP | - | μs |
| $I_L$ | RGK= 1KΩ $I_{GT}$ = 1 mA | $T_j$=25°C | MAX | 6 | mA |
| $I_H$ | $I_T$= 50mA RGK= 1KΩ | $T_j$=25°C | MAX | 5 | mA |
| $V_{TM}$ | IT= 1 A tp=380μs | $T_j$=25°C | MAX | 1.35 | V |
| $I_{DRM}$ $I_{RRM}$ | $V_D$=$V_{DRM}$ ,$V_R$=$V_{RRM}$ | $T_j$=110°C | MAX | 0.1 | μA |
| | | $T_j$=110°C | MAX | 0.1 | mA |
| $dV_D/dt$ | $V_D$=67%$V_{DR}$ exponential waveform; $R_{GK}$ = 100 Ω | $T_j$=125°C | MIN | 10 | V/μs |

## Thermal Resistances :

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ (j-c)}$ | junction to mounting base | SOT-89 | 45 | °C/W |
| | | SOT-223 | 31 | |
| | | SOT-23-3L/TO-92 | 75 | |

Fig.1:Maximum average power dissipation versus average on-state current

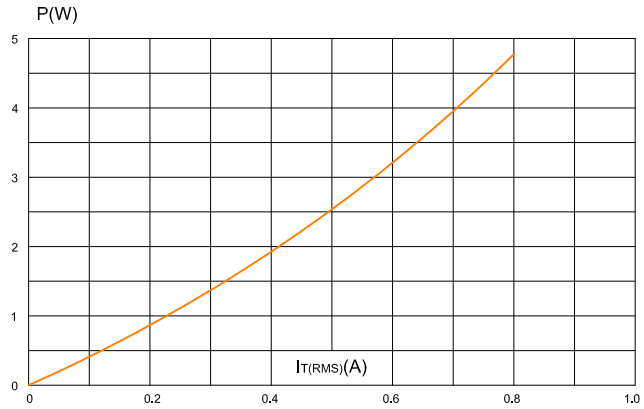



Fig.2 : RMS on-state current versus case temperature

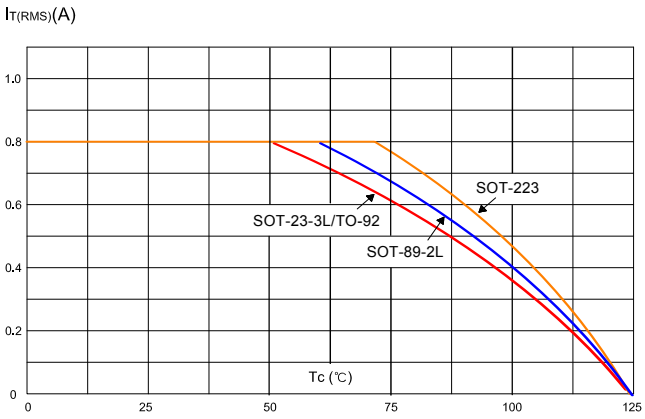



Fig.3 : On-state characteristics

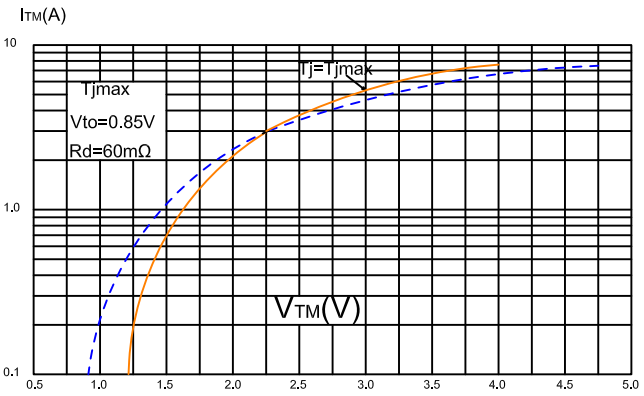



Fig.4 : Surge peak on-state current versus number of cycles

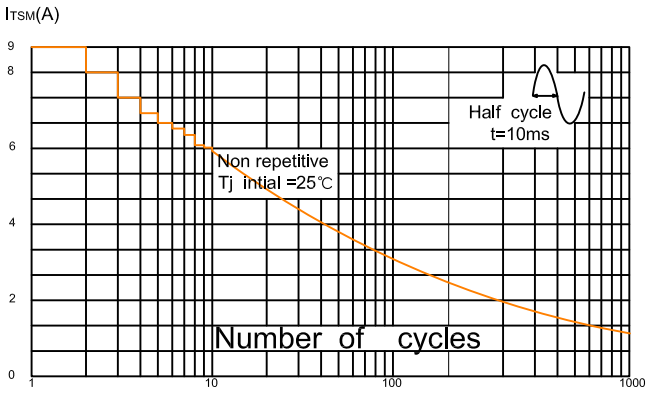



Fig.5 :Non repetitive surge peak on-state current for a sinusoidal pulse with width : tp ≤ 10ms, and corresponding value of $I^2t$.

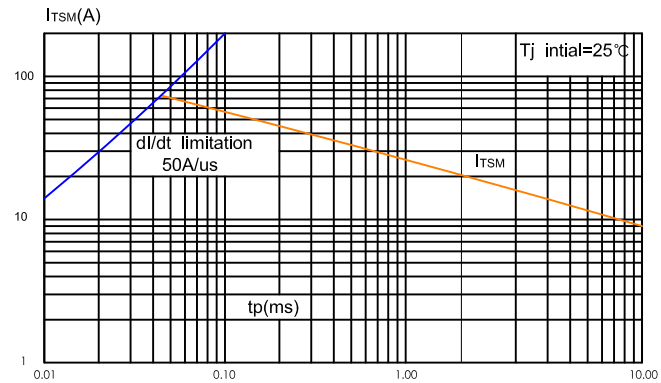
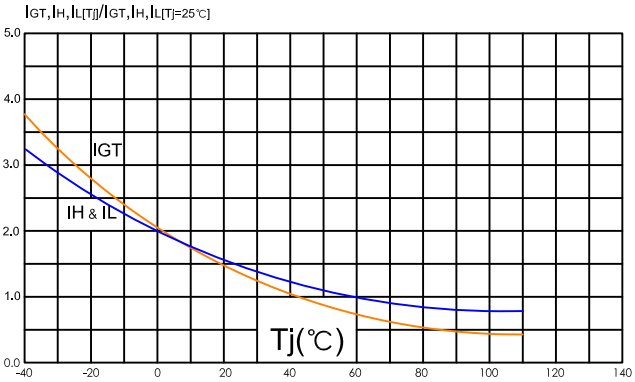
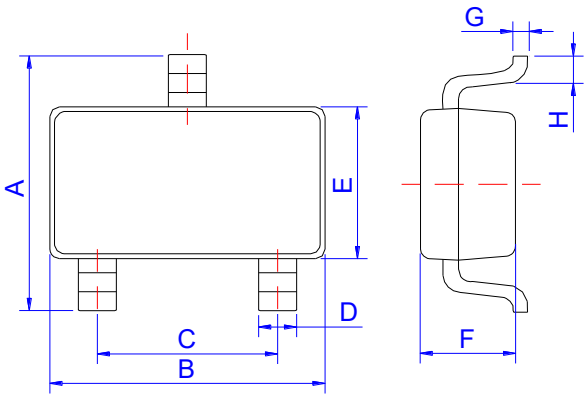



Fig.6 :Relative variation of gate trigger current and holding current and latching current versus junction temperature

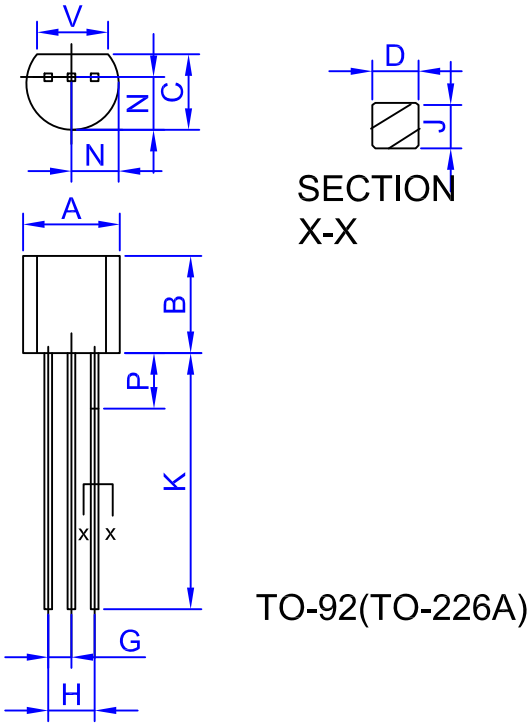


## Package Mechanical Data :



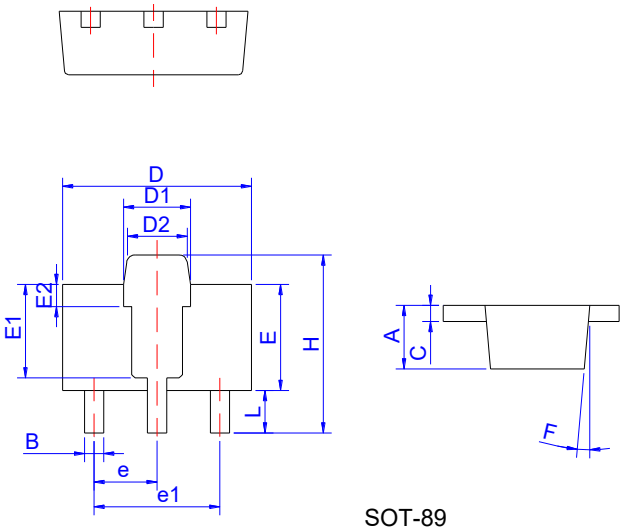

SOT-23-3L

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.65 | | 2.95 | 0.104 | | 0.116 |
| B | | 2.92 | | | 0.115 | |
| C | | 1.90 | | | 0.075 | |
| D | 0.34 | | 0.36 | 0.013 | | 0.014 |
| E | | 1.60 | | | 0.063 | |
| F | | 1.17 | | | 0.046 | |
| G | | 0.15 | | | 0.006 | |
| H | 0.25 | | 0.55 | 0.010 | | 0.022 |



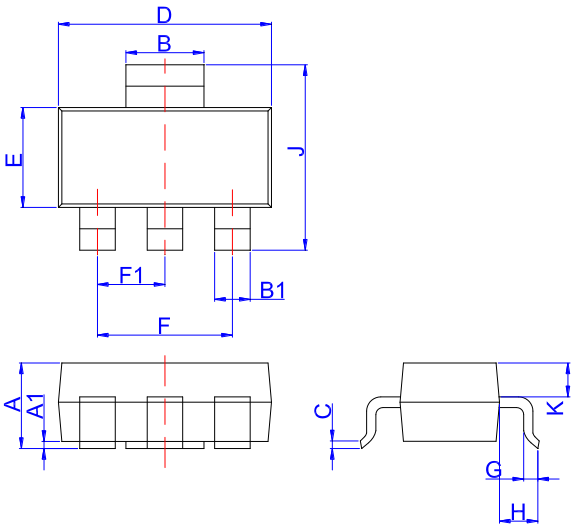

TO-92(TO-226A)

| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.45 | 5.2 | 0.175 | 0.205 |
| B | 4.32 | 5.33 | 0.170 | 0.210 |
| C | 3.18 | 4.19 | 0.125 | 0.165 |
| D | 0.407 | 0.533 | 0.016 | 0.021 |
| G | 1.15 | 1.39 | 0.045 | 0.055 |
| H | 2.42 | 2.66 | 0.095 | 0.105 |
| J | 0.39 | 0.50 | 0.015 | 0.020 |
| K | 12.70 | - | 0.500 | - |
| N | 2.04 | 2.66 | 0.080 | 0.105 |
| P | - | 2.54 | - | 0.100 |
| V | 3.43 | - | 0.135 | - |




SOT-89

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 1.40 | | 1.60 | 0.055 | | 0.063 |
| B | 0.40 | | 0.52 | 0.016 | | 0.020 |
| C | 0.35 | | 0.41 | 0.014 | | 0.016 |
| D | 4.40 | | 4.60 | 0.173 | | 0.181 |
| D1 | 1.50 | | 1.70 | 0.059 | | 0.067 |
| D2 | 1.30 | | 1.50 | 0.051 | | 0.059 |
| E | 2.40 | | 2.60 | 0.094 | | 0.102 |
| E1 | | 2.20 | | | 0.087 | |
| E2 | | 0.52 | | | 0.020 | |
| e | | 1.50 | | | 0.059 | |
| e1 | | 3.00 | | | 0.118 | |
| F | | 5° | | | 0.197° | |
| H | 4.05 | | 4.25 | 0.159 | | 0.167 |
| L | 0.89 | | 1.20 | 0.035 | | 0.047 |




SOT-223

| 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 | 0.06 | 0.10 | 0 | 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 | 0.26 | 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 | | | 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 |