

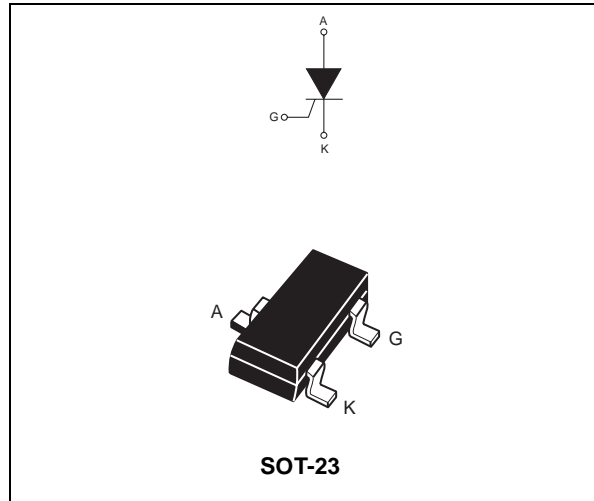
### MAIN FEATURES:

| Symbol            | Value | Unit    |
|-------------------|-------|---------|
| $I_{T(RMS)}$      | 0.25  | A       |
| $V_{DRM}/V_{RRM}$ | 200   | V       |
| $I_{GT}$          | 200   | $\mu A$ |

### DESCRIPTION

Thanks to highly sensitive triggering levels, the PO102BL SCR is suitable for all applications where the available gate current is limited such as stand-by mode power supplies, smoke and alarm detectors...

Available in SOT-23, it provides optimized space saving on high density printed circuit boards.



### ABSOLUTE RATINGS (limiting values)

| Symbol             | Parameter   |                        | Value                   | Unit                                       |
|--------------------|---|------------------------|-------------------------|--|
| $I_{T(RMS)}$       | RMS on-state current (180° conduction angle)  |                        | $T_{amb} = 30^{\circ}C$ | 0.25 A                                     |
| $I_{T(AV)}$        | Average on-state current (180° conduction angle)  |                        | $T_{amb} = 30^{\circ}C$ | 0.17 A                                     |
| $I_{TSM}$          | Non repetitive surge peak on-state current  | $t_p = 8.3 \text{ ms}$ | $T_j = 25^{\circ}C$     | 7  |
|                    |   | $t_p = 10 \text{ ms}$  |                         | 6  |
| $I^2t$             | $I^2t$ Value for fusing   | $t_p = 10 \text{ ms}$  | $T_j = 25^{\circ}C$     | 0.18 $A^2s$                                |
| $di/dt$            | Critical rate of rise of on-state current<br>$I_G = 2 \times I_{GT}$ , $t_r \leq 100ns$ | $F = 60 \text{ Hz}$    | $T_j = 125^{\circ}C$    | 50 $A/\mu s$                               |
| $I_{GM}$           | Peak gate current   | $t_p = 20 \mu s$       | $T_j = 125^{\circ}C$    | 0.5 A                                      |
| $P_{G(AV)}$        | Average gate power dissipation  |                        | $T_j = 125^{\circ}C$    | 0.02 W                                     |
| $T_{stg}$<br>$T_j$ | Storage junction temperature range<br>Operating junction temperature range              |                        |                         | - 40 to + 150<br>- 40 to + 125 $^{\circ}C$ |

**ELECTRICAL CHARACTERISTICS** (T<sub>j</sub> = 25°C, unless otherwise specified)

| Symbol           | Test Conditions  |                        | P0102BL | Unit |      |
|------------------|--|------------------------|---------|------|------|
| I <sub>GT</sub>  | V <sub>D</sub> = 12 V R <sub>L</sub> = 140 Ω                                     | MAX.                   | 200     | μA   |      |
| V <sub>GT</sub>  |  | MAX.                   | 0.8     | V    |      |
| V <sub>GD</sub>  | V <sub>D</sub> = V <sub>DRM</sub> R <sub>L</sub> = 3.3 kΩ R <sub>GK</sub> = 1 kΩ | T <sub>j</sub> = 125°C | MIN.    | 0.1  | V    |
| V <sub>RG</sub>  | I <sub>RG</sub> = 10 μA  |                        | MIN.    | 8    | V    |
| I <sub>H</sub>   | I <sub>T</sub> = 50 mA R <sub>GK</sub> = 1kΩ                                     |                        | MAX.    | 6    | mA   |
| I <sub>L</sub>   | I <sub>G</sub> = 1 mA R <sub>GK</sub> = 1kΩ                                      |                        | MAX.    | 7    | mA   |
| dV/dt            | V <sub>D</sub> = 67 % V <sub>DRM</sub> R <sub>GK</sub> = 1kΩ                     | T <sub>j</sub> = 125°C | MIN.    | 200  | V/μs |
| V <sub>TM</sub>  | I <sub>TM</sub> = 0.4 A tp = 380 μs  | T <sub>j</sub> = 25°C  | MAX.    | 1.7  | V    |
| V <sub>T0</sub>  | Threshold voltage  | T <sub>j</sub> = 125°C | MAX.    | 1.0  | V    |
| R <sub>d</sub>   | Dynamic resistance   | T <sub>j</sub> = 125°C | MAX.    | 1000 | mΩ   |
| I <sub>DRM</sub> | V <sub>DRM</sub> = V <sub>RRM</sub>  | T <sub>j</sub> = 25°C  | MAX.    | 1    | μA   |
| I <sub>RRM</sub> |  | T <sub>j</sub> = 125°C |         | 100  |      |

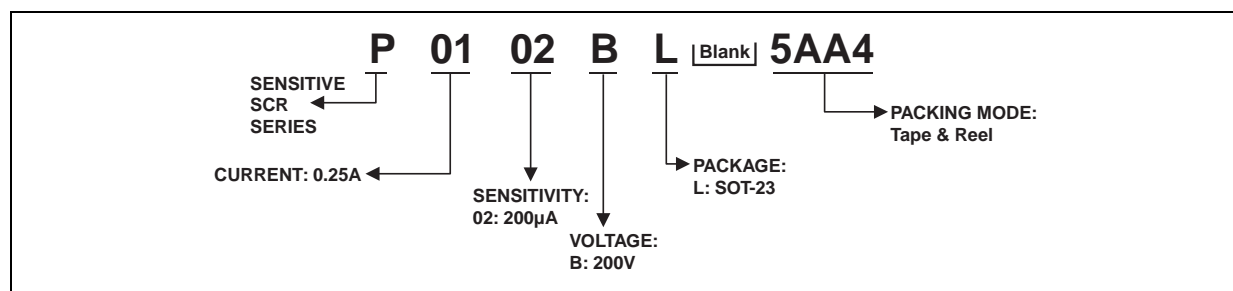
**THERMAL RESISTANCES**

| Symbol               | Parameter  | Value | Unit |
|----------------------|--|-------|------|
| R <sub>th(j-a)</sub> | Junction to ambient (mounted on FR4 with recommended pad layout) | 400   | °C/W |

**PRODUCT SELECTOR**

| Part Number | Voltage | Sensitivity | Package |
|-------------|---------|-------------|---------|
| P0102BL     | 200 V   | 200 μA      | SOT-23  |

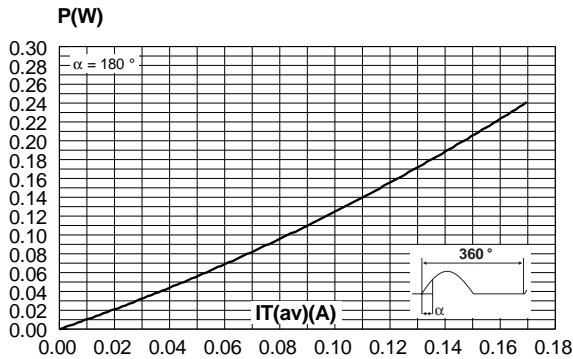
**ORDERING INFORMATION**



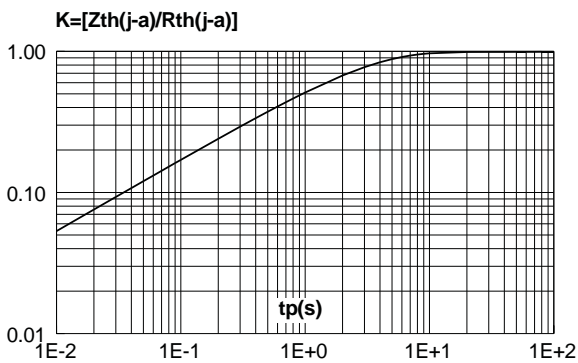
**OTHER INFORMATION**

| Part Number | Marking | Weight | Base quantity | Packing mode |
|-------------|---------|--------|---------------|--------------|
| P0102BL     | P2B     | 0.01 g | 3000          | Tape & reel  |

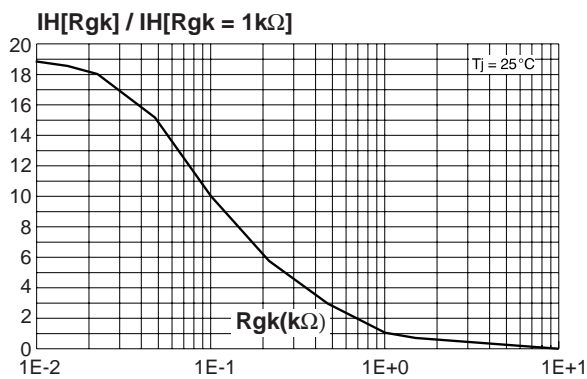
**Fig. 1:** Maximum average power dissipation versus average on-state current.



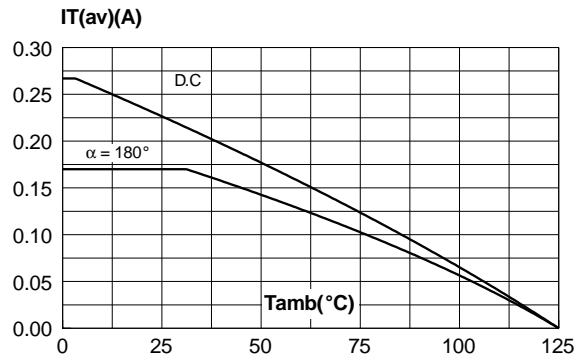
**Fig. 3:** Relative variation of thermal impedance junction to ambient versus pulse duration.



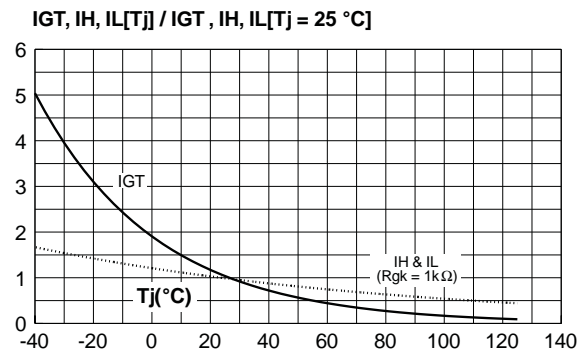
**Fig. 5:** Relative variation of holding current versus gate-cathode resistance (typical values).



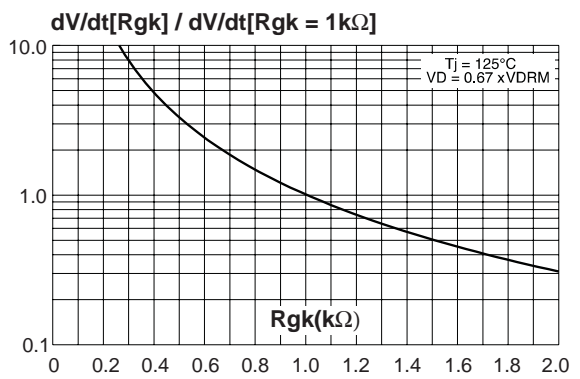
**Fig. 2:** Average and D.C. on-state current versus ambient temperature.



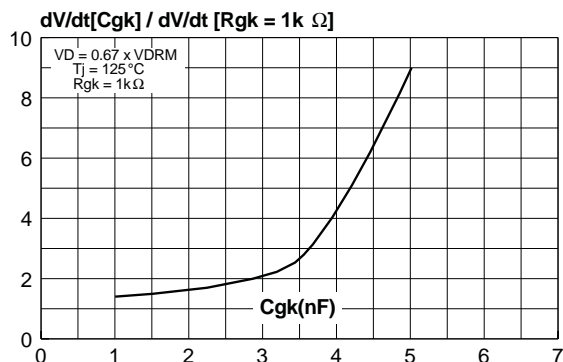
**Fig. 4:** Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).



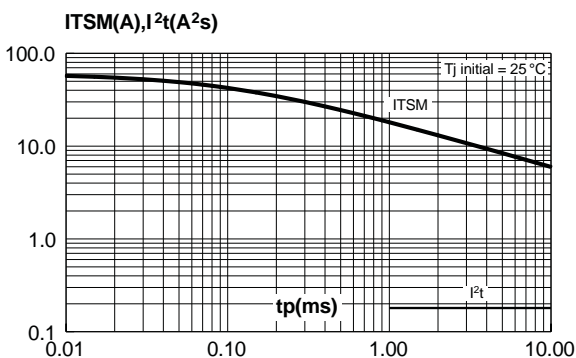
**Fig. 6:** Relative variation of dV/dt immunity versus gate-cathode resistance (typical values).



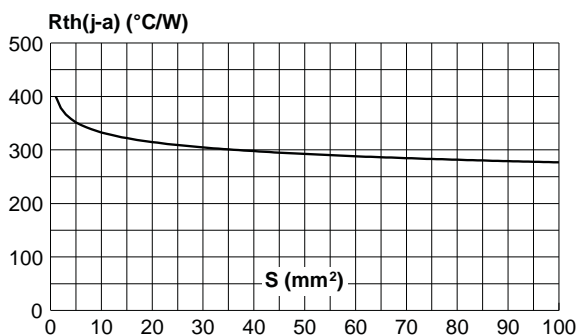
**Fig. 7:** Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values).



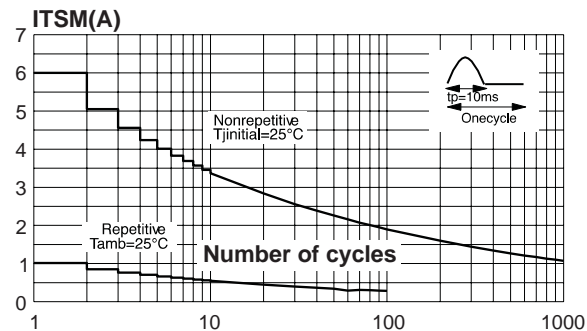
**Fig. 9:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10ms$ , and corresponding value of  $I^2t$ .



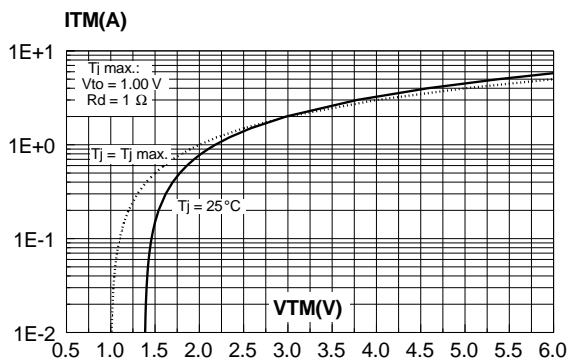
**Fig. 11:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness:  $35 \mu m$ ).



**Fig. 8:** Surge peak on-state current versus number of cycles.

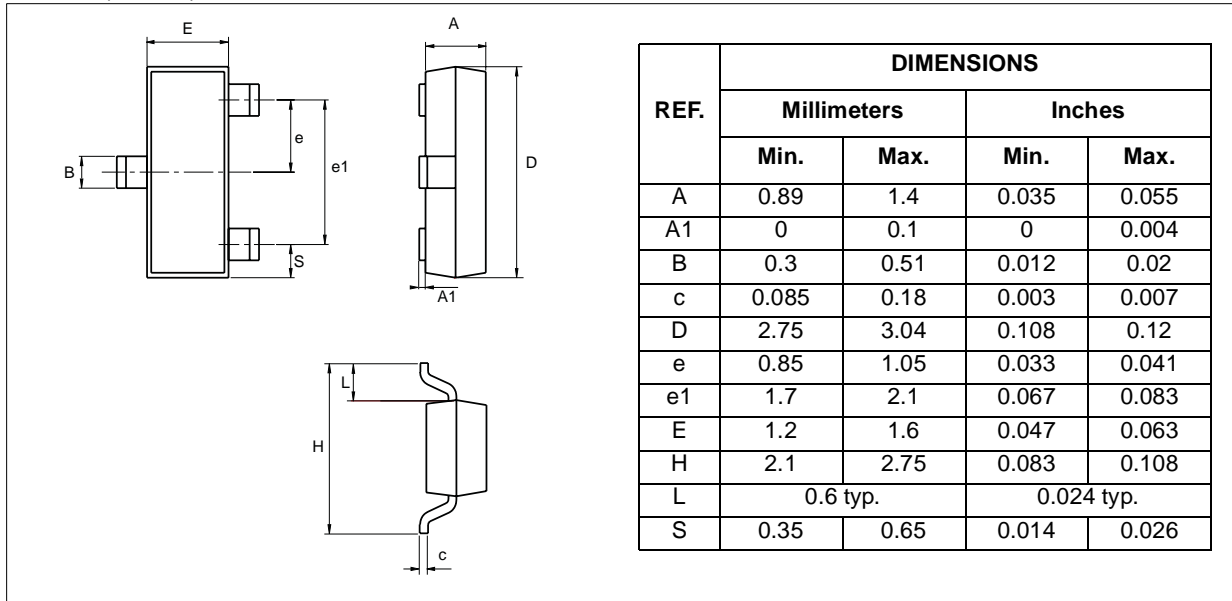


**Fig. 10:** On-state characteristics (maximum values).



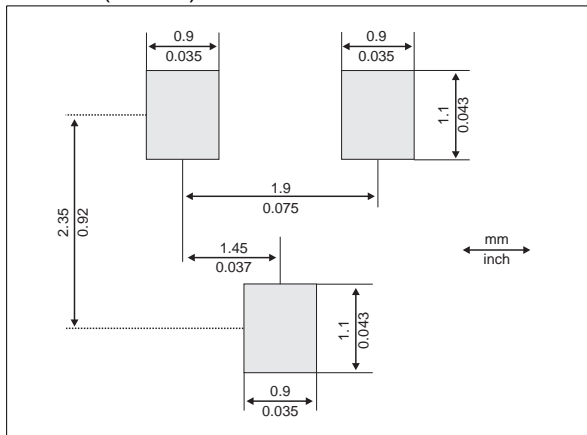
**PACKAGE MECHANICAL DATA**

SOT-23 (Plastic)



**FOOTPRINT DIMENSIONS (in millimeters)**

SOT-23 (Plastic)



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