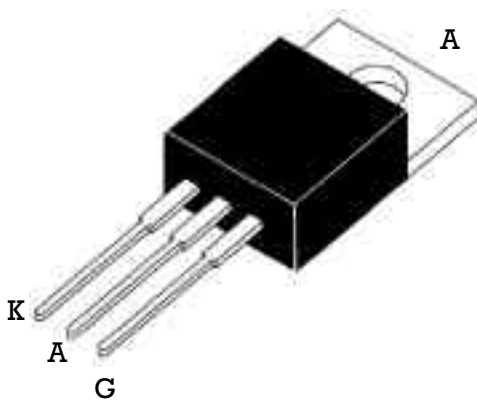


## SENSITIVE GATE SCR

|  |  |
|--|--|
| <p><b>TO220-AB</b></p>   | <p><b>On-State Current</b><br/>4 Amp</p> <p><b>Gate Trigger Current</b><br/>&lt; 200 <math>\mu</math>A</p> <p><b>Off-State Voltage</b><br/>200 V ÷ 600 V</p> |
| <p>These series of <b>Silicon C</b>ontrolled <b>R</b>ectifier use a high performance PNP technology.</p> <p>These parts are intended for general purpose applications where high gate sensitivity is required.</p> |  |

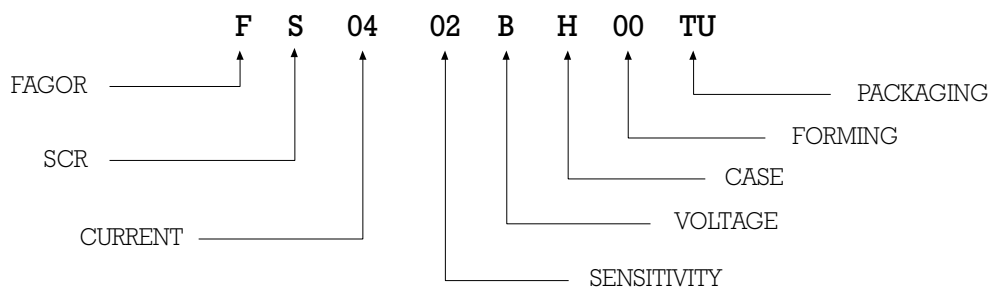
## Absolute Maximum Ratings, according to IEC publication No. 134

| SYMBOL       | PARAMETER                       | CONDITIONS  | Min. | Max. | Unit                 |
|--------------|---------------------------------|---|------|------|----------------------|
| $I_{T(RMS)}$ | On-state Current                | 180° Conduction Angle, $T_c = 115^\circ\text{C}$      |      | 4    | A                    |
| $I_{T(AV)}$  | Average On-state Current        | Half Cycle, $= 180^\circ$ , $T_c = 115^\circ\text{C}$ |      | 2.5  | A                    |
| $I_{TSM}$    | Non-repetitive On-State Current | Half Cycle, 60 Hz                                     |      | 33   | A                    |
| $I_{TSM}$    | Non-repetitive On-State Current | Half Cycle, 50 Hz                                     |      | 30   | A                    |
| $I^2t$       | Fusing Current                  | $t_p = 10\text{ms}$ , Half Cycle                      |      | 4.5  | $\text{A}^2\text{s}$ |
| $V_{GRM}$    | Peak Reverse Gate Voltage       | $I_{GR} = 10 \mu\text{A}$                             |      | 8    | V                    |
| $I_{GM}$     | Peak Gate Current               | 20 $\mu\text{s}$ max.                                 |      | 4    | A                    |
| $P_{GM}$     | Peak Gate Dissipation           | 20 $\mu\text{s}$ max.                                 |      | 5    | W                    |
| $P_{G(AV)}$  | Gate Dissipation                | 20ms max.   |      | 0.5  | W                    |
| $T_j$        | Operating Temperature           |   | -40  | +125 | $^\circ\text{C}$     |
| $T_{stg}$    | Storage Temperature             |   | -40  | +150 | $^\circ\text{C}$     |
| $T_{sld}$    | Soldering Temperature           | 10s max.  |      | 260  | $^\circ\text{C}$     |

| SYMBOL                 | PARAMETER                         | CONDITIONS             | VOLTAGE |     |     | Unit |
|------------------------|-----------------------------------|------------------------|---------|-----|-----|------|
|                        |                                   |                        | B       | D   | M   |      |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive Peak Off State Voltage | $R_{CK} = 1 \text{ K}$ | 200     | 400 | 600 | V    |

**SENSITIVE GATE SCR**
**Electrical Characteristics**

| SYMBOL              | PARAMETER                               | CONDITIONS  | SENSITIVITY |      | Unit         |
|---------------------|---|---|-------------|------|--------------|
|                     |   |   |             | 02   |              |
| $I_{GT}$            | Gate Trigger Current                    | $V_D = 12 V_{DC}, R_L = 33 \Omega, T_j = 25^\circ C$                                | MAX         | 200  | $\mu A$      |
| $I_{DRM} / I_{RRM}$ | Off-State Leakage Current               | $V_D = V_{DRM}, R_{GK} = 220 \Omega, T_j = 125^\circ C$                             | MAX         | 1    | mA           |
|                     |   | $V_R = V_{RRM}, T_j = 25^\circ C$   | MAX         | 5    | $\mu A$      |
| $V_{TM}$            | On-state Voltage                        | at $I_T = 8 \text{ Amp}, t_p = 380 \mu s, T_j = 25^\circ C$                         | MAX         | 1.6  | V            |
| $V_{GT}$            | Gate Trigger Voltage                    | $V_D = 12 V_{DC}, R_L = 33 \Omega, T_j = 25^\circ C$                                | MAX         | 0.8  | V            |
| $V_{GD}$            | Gate Non Trigger Voltage                | $V_D = V_{DRM}, R_L = 3.3K \Omega, R_{GK} = 220 \Omega, T_j = 125^\circ C$          | MIN         | 0.1  | V            |
| $I_H$               | Holding Current                         | $I_T = 50 \text{ mA}, R_{GK} = 220 \Omega, T_j = 25^\circ C$                        | MAX         | 5    | mA           |
| $I_L$               | Latching Current                        | $I_G = 1 \text{ mA}, R_{GK} = 1 K \Omega$   | MAX         | 6    | mA           |
| $dv / dt$           | Critical Rate of Voltage Rise           | $V_D = 0.65 \times V_{DRM}, R_{GK} = 220 \Omega, T_j = 125^\circ C$                 | MIN         | 5    | V/ $\mu s$   |
| $di / dt$           | Critical Rate of Current Rise           | $I_G = 2 \times I_{GT}, T_r = 100 \text{ ns}, f = 60 \text{ Hz}, T_j = 125^\circ C$ | MIN         | 50   | A/ $\mu s$   |
| $R_{th(j-c)}$       | Thermal Resistance Junction-Case for DC |   |             | 3    | $^\circ C/W$ |
| $R_{th(j-a)}$       | Thermal Resistance Junction-Amb for DC  |   |             | 60   | $^\circ C/W$ |
| $V_{t0}$            | Threshold Voltage                       | $T_j = 125^\circ C$   | MAX         | 0.85 | V            |
| $R_d$               | Dynamic resistance                      | $T_j = 125^\circ C$   | MAX         | 90   | m            |

**PART NUMBER INFORMATION**


## SENSITIVE GATE SCR

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

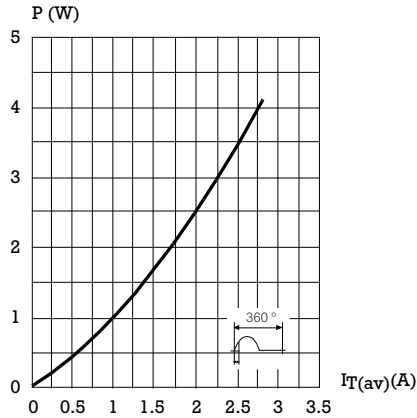


Fig. 3: Relative variation of thermal impedance junction to case pulse duration.

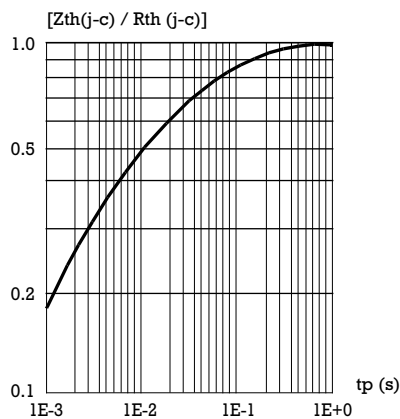


Fig. 5: Non repetitive surge peak on-state current versus number of cycles.

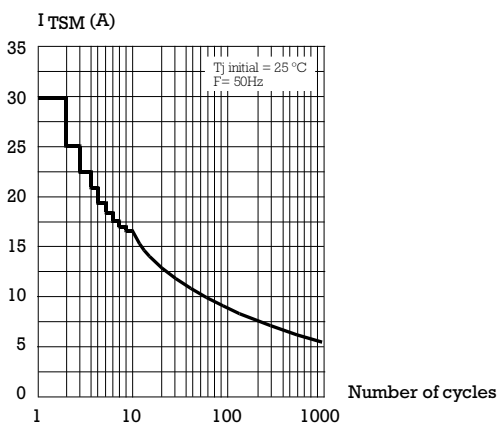


Fig. 2: Average and D.C. on-state current versus case temperature.

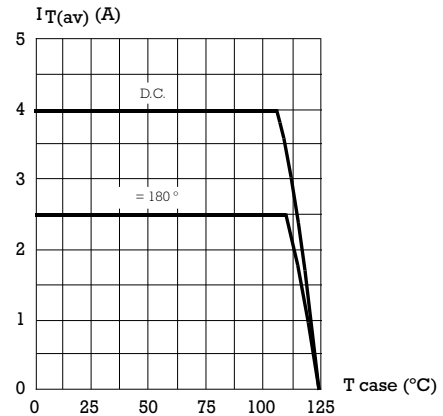
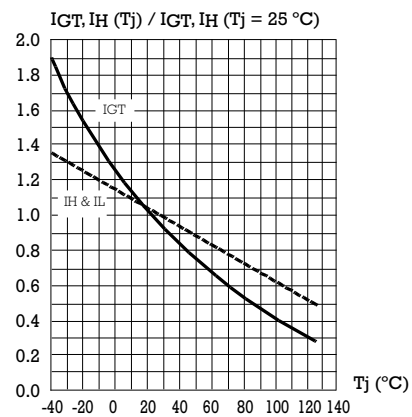
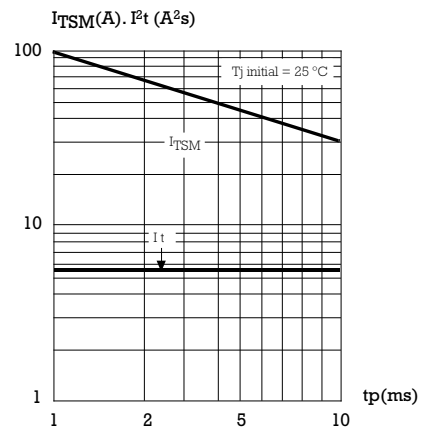
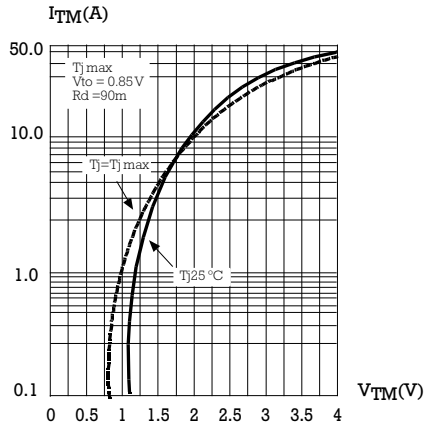


Fig. 4: Relative variation of gate trigger current, holding and latching current versus junction temperature.


 Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width:  $t_p < 10$  ms, and corresponding value of  $I^2t$ .


**SENSITIVE GATE SCR**

Fig. 7: On-state characteristics (maximum values).



**PACKAGE MECHANICAL DATA TO-220AB**

| REF. | DIMENSIONS |         |       |
|------|------------|---------|-------|
|      | Milimeters |         |       |
|      | Min.       | Nominal | Max.  |
| A    | 15.20      |         | 15.90 |
| a1   |            | 3.75    |       |
| a2   | 13.00      |         | 14.00 |
| B    | 10.00      |         | 10.40 |
| b1   | 0.61       |         | 0.88  |
| b2   | 1.23       |         | 1.32  |
| C    | 4.40       |         | 4.60  |
| c1   | 0.49       |         | 0.70  |
| c2   | 2.40       |         | 2.72  |
| e    | 2.40       |         | 2.70  |
| F    | 6.20       |         | 6.60  |
| I    | 3.75       |         | 3.85  |
| I4   | 15.80      | 16.40   | 16.80 |
| L    | 2.65       |         | 2.95  |
| I2   | 1.14       |         | 1.70  |
| I3   | 1.14       |         | 1.70  |
| M    |            | 2.60    |       |