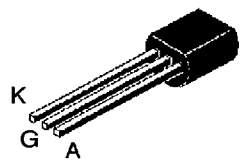
SGS-THOMSON MICROELECTRONICS

# P01xxxA/B

## SENSITIVE GATE SCR

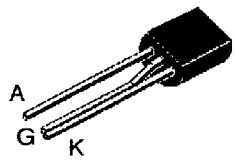
### FEATURES

- $I_{T(RMS)}$ = 0.8A
- $V_{DRM}$ = 100V to 400V
- Low $I_{GT}$ < 1µA max to < 200µA




**TO92**
(Plastic)

**P01xxxA**




**RD26**
(Plastic)

**P01xxxB**

### DESCRIPTION

The P01xxxA/B series of SCRs uses a high performance planar PNPN technology. These parts are intended for general purpose applications where low gate sensitivity is required.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (180° conduction angle) | Tl= 55°C | 0.8 | A |
| $I_{T(AV)}$ | Mean on-state current (180° conduction angle) | Tl= 55°C | 0.5 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current ($T_j$ initial = 25°C ) | tp = 8.3 ms | 8 | A |
| | | tp = 10 ms | 7 | |
| $I^2t$ | $I^2t$ Value for fusing | tp = 10 ms | 0.24 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current $I_G$ = 10 mA $di_G/dt$ = 0.1 A/µs. | | 30 | A/µs |
| $T_{stg}$ $T_j$ | Storage and operating junction temperature range | | - 40, +150 - 40, +125 | °C |
| Tl | Maximum lead temperature for soldering during 10s at 2mm from case | | 260 | °C |

| Symbol | Parameter | Voltage | | | | Unit |
|---|---|---|---|---|---|---|
| | | A | B | C | D | |
| $V_{DRM}$ $V_{RRM}$ | Repetitive peak off-state voltage $T_j$ = 125°C $R_{GK}$ = 1KΩ | 100 | 200 | 300 | 400 | V |

## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| Rth(j-a) | Junction to ambient | 150 | °C/W |
| Rth(j-l) | Junction to leads for DC | 80 | °C/W |

## GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$= 0.1 W $P_{GM}$ = 2 W (tp = 20 µs) $I_{GM}$ = 1 A (tp = 20 µs)

## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Sensitivity | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 02 | 09 | 11 | 15 | 18 | |
| $I_{GT}$ | $V_D$=12V (DC) $R_L$=140Ω | Tj= 25°C | MIN | | | 4 | 15 | 0.5 | µA |
| | | | MAX | 200 | 1 | 25 | 50 | 5 | |
| $V_{GT}$ | $V_D$=12V (DC) $R_L$=140Ω | Tj= 25°C | MAX | 0.8 | | | | | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $R_L$=3.3kΩ $R_{GK}$ = 1 KΩ | Tj= 125°C | MIN | 0.1 | | | | | V |
| $V_{RGM}$ | $I_{RG}$ =10µA | Tj= 25°C | MIN | 8 | | | | | V |
| tgd | $V_D$=$V_{DRM}$ $I_{TM}$= 3 x $I_{T(AV)}$ $dI_G/dt$ = 0.1A/µs $I_G$ = 10mA | Tj= 25°C | TYP | 0.5 | | | | | µs |
| $I_H$ | $I_T$= 50mA $R_{GK}$ = 1 KΩ | Tj= 25°C | MAX | 5 | | | | | mA |
| $I_L$ | $I_G$=1mA $R_{GK}$ = 1 KΩ | Tj= 25°C | MAX | 6 | | | | | mA |
| $V_{TM}$ | $I_{TM}$= 1.6A tp= 380µs | Tj= 25°C | MAX | 1.93 | | | | | V |
| $I_{DRM}$ $I_{RRM}$ | $V_D$ = $V_{DRM}$ $R_{GK}$ = 1 KΩ $V_R$ = $V_{RRM}$ | Tj= 25°C | MAX | 1 | | | | | µA |
| | | Tj= 125°C | MAX | 100 | | | | | µA |
| dV/dt | $V_D$=67%$V_{DRM}$ $R_{GK}$ = 1 KΩ | Tj= 125°C | MIN | 25 | 25 | 50 | 100 | 30 | V/µs |
| tq | $I_{TM}$= 3 x $I_{T(AV)}$ $V_R$=35V dI/dt=10A/µs tp=100µs dV/dt=10V/µs $V_D$= 67%$V_{DRM}$ $R_{GK}$ = 1 KΩ | Tj= 125°C | MAX | 200 | | | | | µs |

## ORDERING INFORMATION

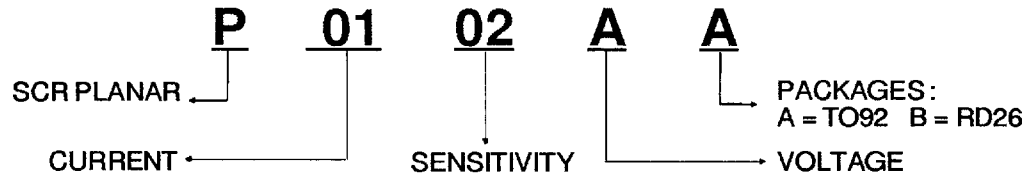


**Fig.1 :** Maximum average power dissipation versus average on-state current.

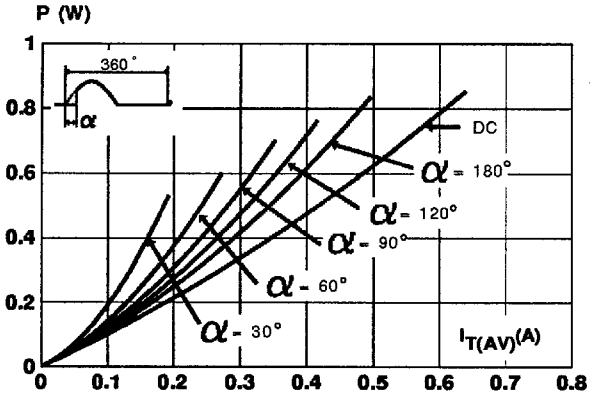



**Fig.2 :** Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tlead).

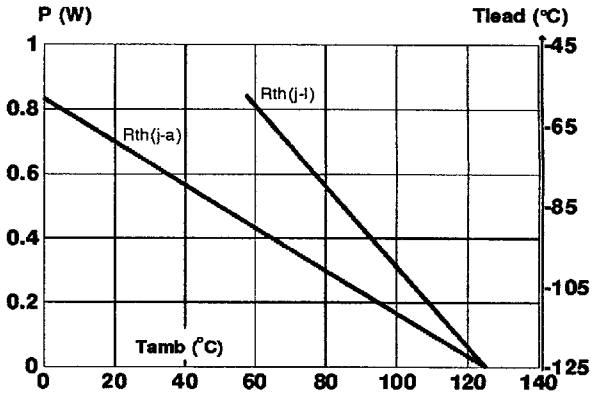



**Fig.3 :** Average on-state current versus lead temperature.

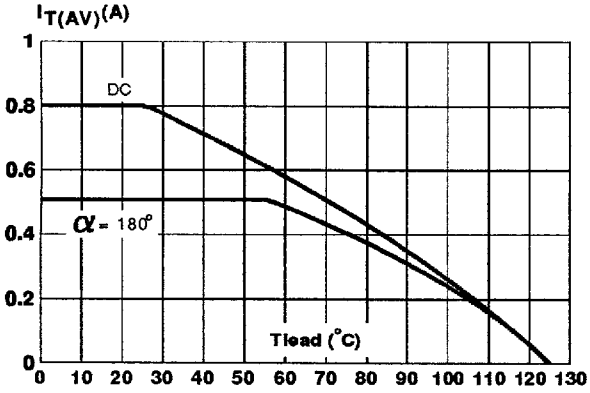



**Fig.4 :** Relative variation of thermal impedance junction to ambient versus pulse duration.

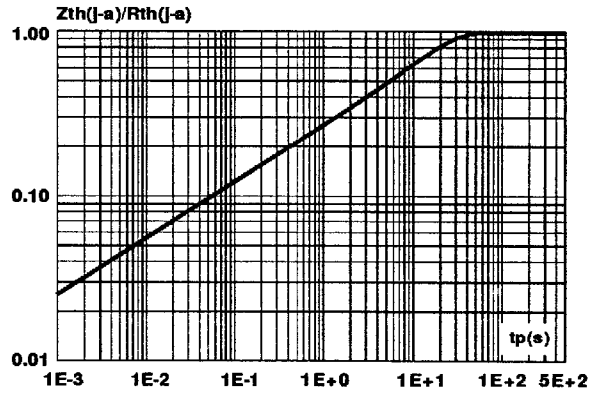



**Fig.5 :** Relative variation of gate trigger current and holding current versus junction temperature.

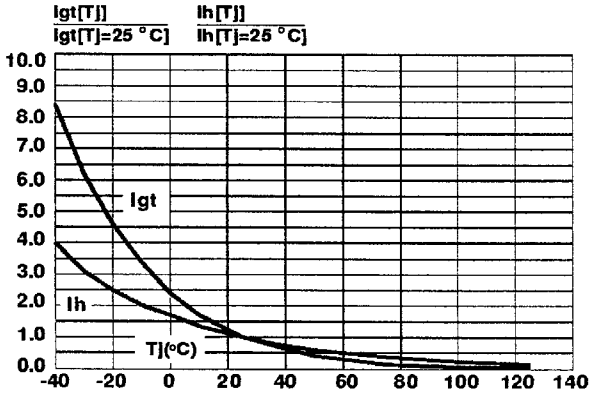



**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

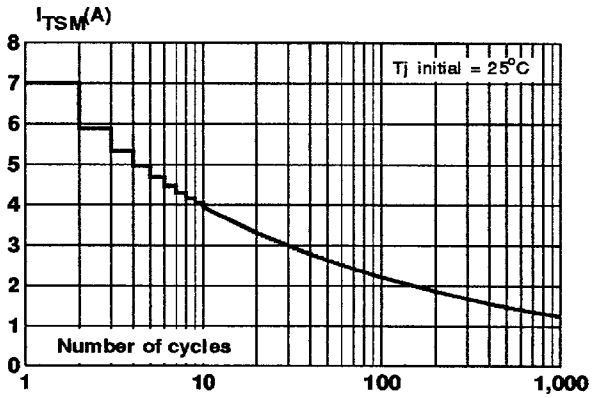


**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width : tp ≤ 10ms, and corresponding value of $I^2t$.

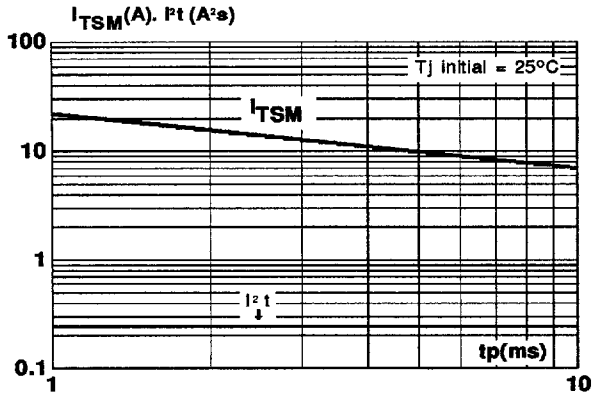



**Fig.8 :** On-state characteristics (maximum values).

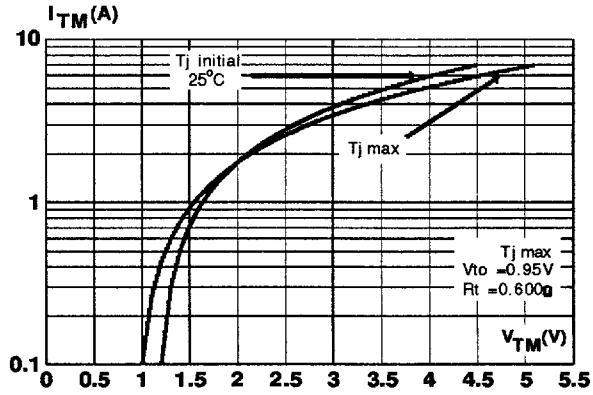
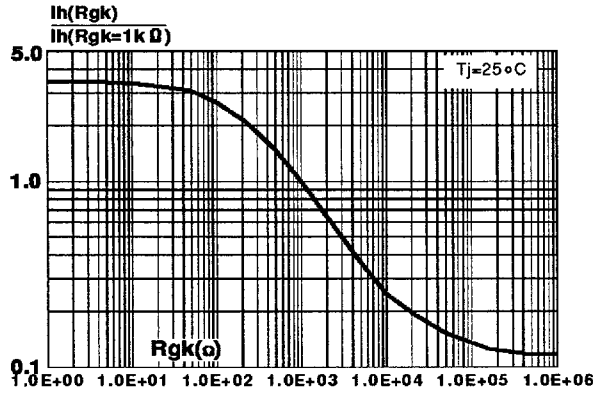
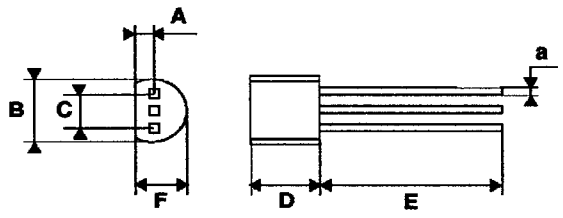



**Fig.9 :** Relative variation of holding current versus gate-cathode resistance (typical values).



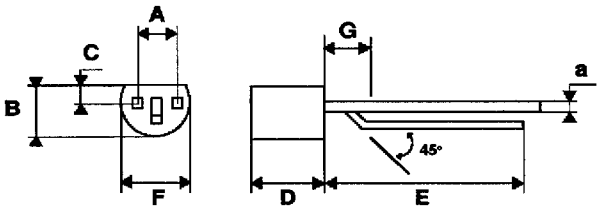
## PACKAGE MECHANICAL DATA
TO92 (Plastic)




| REF. | DIMENSIONS | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Typ. | Min. | Max. | Typ. | Min. | Max. |
| A | 1.35 | | | 0.053 | | |
| B | | | 4.7 | | | 0.185 |
| C | 2.54 | | | 0.100 | | |
| D | | 4.4 | 4.8 | | 0.173 | 0.189 |
| E | | 12.7 | | | 0.500 | |
| F | | | 3.7 | | | 0.146 |
| a | | | 0.45 | | | 0.017 |

Marking : type number
Weight : 0.2 g

## PACKAGE MECHANICAL DATA
RD26 (Plastic)




| REF. | DIMENSIONS | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Typ. | Min. | Max. | Typ. | Min. | Max. |
| A | 2.54 | | | 0.100 | | |
| B | | | 3.7 | | | 0.146 |
| C | 1.35 | | | 0.053 | | |
| D | | 4.4 | 4.8 | | 0.173 | 0.189 |
| E | | 12.7 | | | 0.500 | |
| F | | | 4.7 | | | 0.185 |
| G | | | 3.0 | | | 0.118 |
| a | | | 0.45 | | | 0.177 |

Marking : type number
Weight : 0.2 g