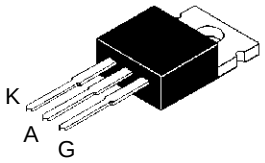
SGS-THOMSON MICROELECTRONICS

# S25xxxH

## SCR

### FEATURES

- $I_{T(RMS)}$ = 25A
- $V_{DRM}$ = 200V to 800V
- High surge current capability




**TO220**
**non-insulated**
(Plastic)

### DESCRIPTION

The S25xxxH series of SCRs uses a high performance MESA GLASS PNPN technology. These parts are intended for general purpose applications.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (180° conduction angle) | Tc= 85°C | 25 | A |
| $I_{T(AV)}$ | Average on-state current (180° conduction angle) | Tc= 85°C | 16 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current ($T_j$ initial = 25°C ) | tp = 8.3 ms | 270 | A |
| | | tp = 10 ms | 250 | |
| $I^2t$ | $I^2t$ Value for fusing | tp = 10 ms | 310 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current $I_G$ = 100 mA $di_G/dt$ = 1 A/µs. | | 100 | 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 4.5mm from case | | 260 | °C |

| Symbol | Parameter | Voltage | | | | Unit |
|---|---|---|---|---|---|---|
| | | B | D | M | N | |
| $V_{DRM}$ $V_{RRM}$ | Repetitive peak off-state voltage $T_j$ = 125°C | 200 | 400 | 600 | 800 | V |

## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| Rth(j-a) | Junction to ambient | 60 | °C/W |
| Rth(j-c) | Junction to case for DC | 1.6 | °C/W |

## GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$= 1 W $P_{GM}$ = 10 W (tp = 20 µs) $I_{GM}$ = 4A (tp = 20 µs)

## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Sensitivity | | Unit |
|---|---|---|---|---|---|---|
| | | | | 14 | 16 | |
| $I_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj= 25°C | MIN | 30 | 20 | mA |
| | | | MAX | 75 | 50 | |
| $V_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj= 25°C | MAX | 1.5 | | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $R_L$=3.3kΩ | Tj= 125°C | MIN | 0.2 | | V |
| tgt | $V_D$=$V_{DRM}$ $I_{TM}$= 3 x $I_{T(AV)}$<br>$dI_G/dt$ = 1.5A/µs $I_G$ = 200mA | Tj= 25°C | TYP | 2 | | µs |
| $I_H$ | $I_T$= 500mA Gate open | Tj= 25°C | MAX | 115 | 100 | mA |
| $I_L$ | $I_G$=1.2 $I_{GT}$ | Tj= 25°C | MAX | 230 | 200 | mA |
| $V_{TM}$ | $I_{TM}$= 50A tp= 380µs | Tj= 25°C | MAX | 1.6 | | V |
| $I_{DRM}$<br>$I_{RRM}$ | $V_D$ = $V_{DRM}$<br>$V_R$ = $V_{RRM}$ | Tj= 25°C | MAX | 10 | | µA |
| | | Tj= 110°C | MAX | 2.5 | | mA |
| dV/dt | $V_D$=67%$V_{DRM}$ Gate open | Tj= 110°C | MIN | 750 | 500 | V/µs |
| tq | $I_{TM}$= 3 x $I_{T(AV)}$ $V_R$=35V<br>dI/dt=25A/µs tp=100µs<br>dV/dt=25V/µs<br>$V_D$= 67%$V_{DRM}$ | Tj= 110°C | MAX | 100 | | µs |

## ORDERING INFORMATION

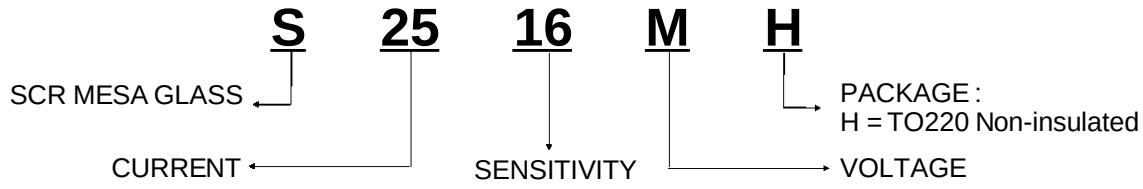


**Fig.1 :** Maximum average power dissipation versus average on-state current.

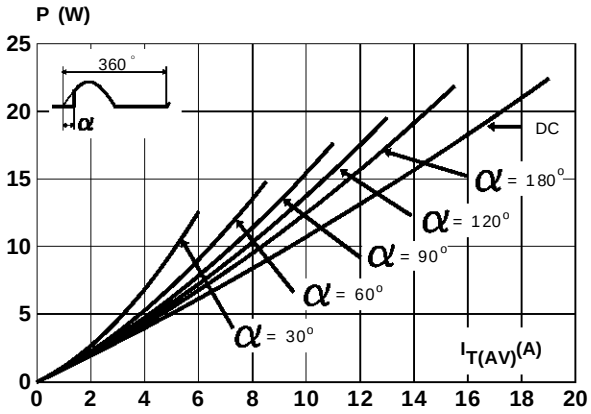



**Fig.2 :** Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact.

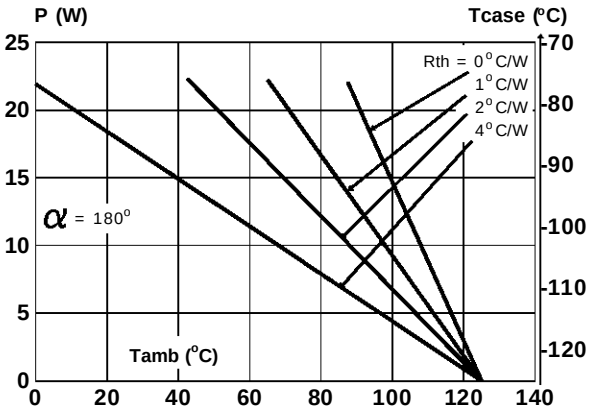



**Fig.3 :** Average on-state current versus case temperature.

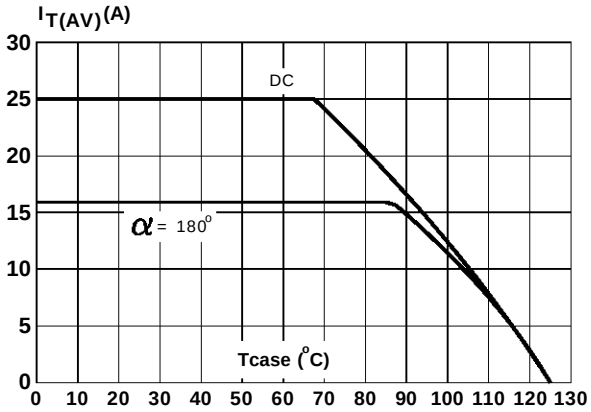



**Fig.4 :** Relative variation of thermal impedance versus pulse duration.

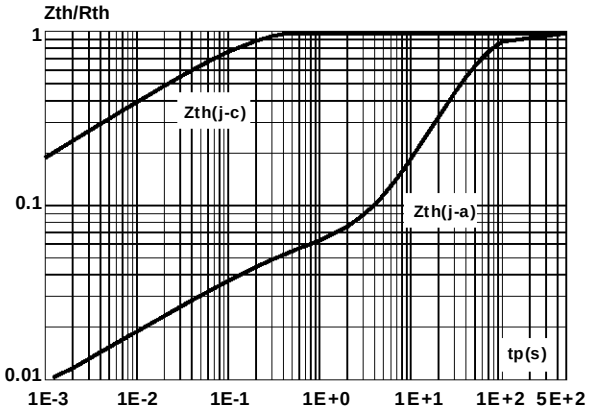



**Fig.5 :** Relative variation of gate trigger current and holding current versus junction temperature.

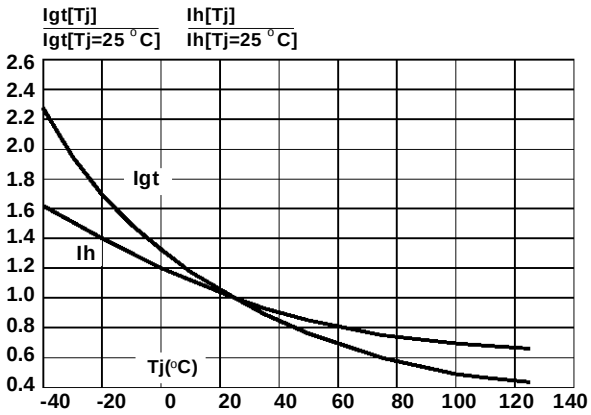



**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

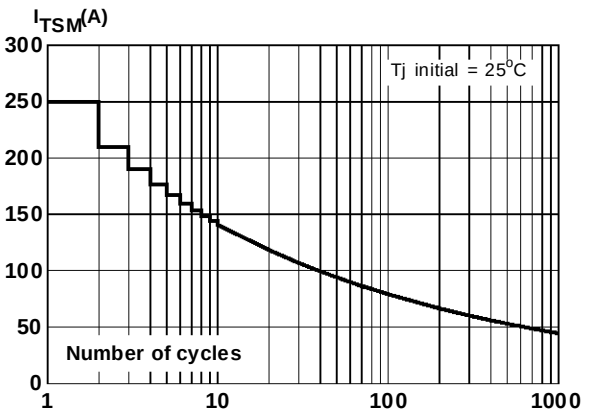


**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width : tp ≤ 10ms, and corresponding value of $I^2t$.

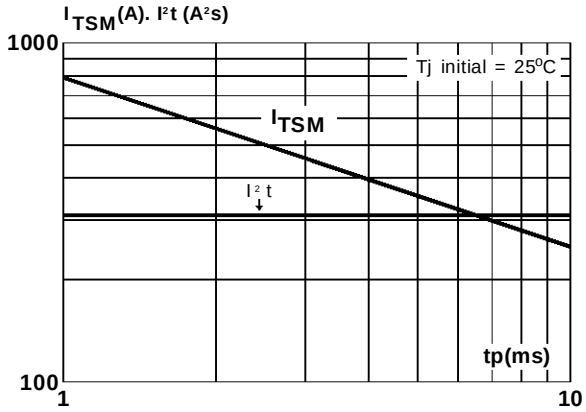
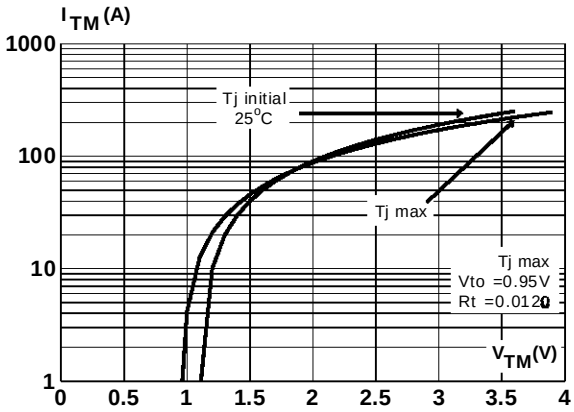
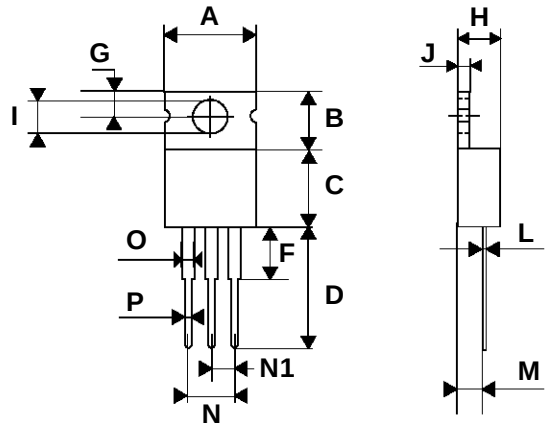



**Fig.8 :** On-state characteristics (maximum values).



**PACKAGE MECHANICAL DATA**
TO220 Non-insulated (Plastic)




| REF. | DIMENSIONS | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Typ. | Min. | Max. | Typ. | Min. | Max. |
| A | | | 10.3 | | | 0.406 |
| B | | 6.3 | 6.5 | 0.248 | 0.256 | |
| C | | | 9.1 | | | 0.358 |
| D | | 12.7 | | | 0.500 | |
| F | | | 4.2 | | | 0.165 |
| G | | | 3.0 | | | 0.118 |
| H | | 4.5 | 4.7 | | 0.177 | 0.185 |
| I | | 3.53 | 3.66 | | 0.139 | 0.144 |
| J | | 1.2 | 1.3 | | 0.047 | 0.051 |
| L | | | 0.9 | | | 0.035 |
| M | 2.7 | | | 0.106 | | |
| N | | | 5.3 | | | 0.209 |
| N1 | 2.54 | | | 0.100 | | |
| O | | 1.2 | 1.4 | | 0.047 | 0.055 |
| P | | | 1.15 | | | 0.045 |

Marking : type number
Weight : 1.8 g