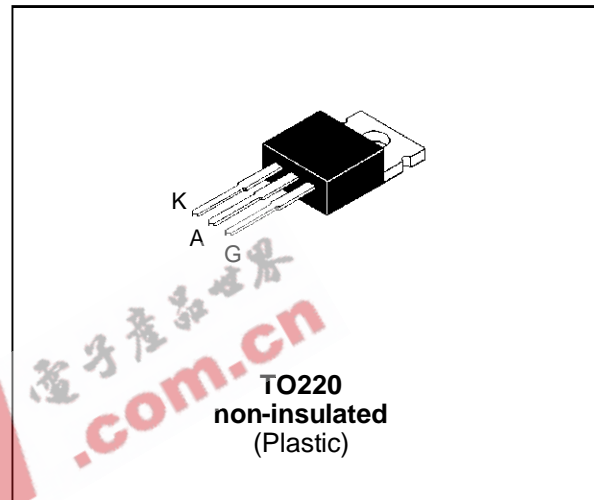


FEATURES

- $I_{T(RMS)} = 12A$
- $V_{DRM} = 200V$ to $800V$
- High surge current capability

DESCRIPTION

The S12xxxH series of SCRs uses a high performance MESA GLASS PNP 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) | $T_c = 90^\circ C$ | 12 | A |
| $I_{T(AV)}$ | Average on-state current (180° conduction angle) | $T_c = 90^\circ C$ | 7.6 | A |
| I_{TSM} | Non repetitive surge peak on-state current (T_j initial = $25^\circ C$) | $t_p = 8.3$ ms | 132 | A |
| | | $t_p = 10$ ms | 120 | |
| I^2t | I^2t Value for fusing | $t_p = 10$ ms | 72 | 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 | $^\circ C$ |
| TI | Maximum lead temperature for soldering during 10s at 4.5mm from case | | 260 | $^\circ C$ |

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

S12xxxH

THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|----------|-------------------------|-------|------|
| Rth(j-a) | Junction to ambient | 60 | °C/W |
| Rth(j-c) | Junction to case for DC | 3 | °C/W |

GATE CHARACTERISTICS (maximum values)

$P_{G(AV)} = 1\text{ W}$ $P_{GM} = 10\text{ W}$ ($t_p = 20\ \mu\text{s}$) $I_{GM} = 4\text{ A}$ ($t_p = 20\ \mu\text{s}$)

ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Sensitivity | | | Unit |
|------------------------|---|---------------------------|-----|-------------|-----|-----|------------------|
| | | | | 06 | 10 | 17 | |
| I_{GT} | $V_D = 12\text{ V (DC)}$ $R_L = 33\ \Omega$ | $T_j = 25^\circ\text{C}$ | MIN | 0.5 | 10 | 4 | mA |
| | | | MAX | 5 | 25 | 15 | |
| V_{GT} | $V_D = 12\text{ V (DC)}$ $R_L = 33\ \Omega$ | $T_j = 25^\circ\text{C}$ | MAX | 1.5 | | | V |
| V_{GD} | $V_D = V_{DRM}$ $R_L = 3.3\text{ k}\Omega$ | $T_j = 125^\circ\text{C}$ | MIN | 0.2 | | | V |
| tgt | $V_D = V_{DRM}$ $I_{TM} = 3 \times I_{T(AV)}$ $dl/dt = 0.5\text{ A}/\mu\text{s}$ $I_G = 40\text{ mA}$ | $T_j = 25^\circ\text{C}$ | TYP | 2 | | | μs |
| I_H | $I_T = 250\text{ mA}$ Gate open | $T_j = 25^\circ\text{C}$ | MAX | 15 | 50 | 30 | mA |
| I_L | $I_G = 1.2 I_{GT}$ | $T_j = 25^\circ\text{C}$ | MAX | 30 | 100 | 60 | mA |
| V_{TM} | $I_{TM} = 24\text{ A}$ $t_p = 380\ \mu\text{s}$ | $T_j = 25^\circ\text{C}$ | MAX | 1.6 | | | V |
| I_{DRM} I_{RRM} | $V_D = V_{DRM}$ $V_R = V_{RRM}$ | $T_j = 25^\circ\text{C}$ | MAX | 5 | | | μA |
| | | $T_j = 110^\circ\text{C}$ | MAX | 1.5 | | | mA |
| dV/dt | $V_D = 67\% V_{DRM}$ Gate open | $T_j = 110^\circ\text{C}$ | MIN | | 200 | 100 | V/ μs |
| | | $T_j = 110^\circ\text{C}$ | TYP | 10 | | | |
| tq | $I_{TM} = 3 \times I_{T(AV)}$ $V_R = 35\text{ V}$ $dl/dt = 10\text{ A}/\mu\text{s}$ $t_p = 100\ \mu\text{s}$ $dV/dt = 5\text{ V}/\mu\text{s}$ $V_D = 67\% V_{DRM}$ | $T_j = 110^\circ\text{C}$ | MAX | 100 | | | μs |

ORDERING INFORMATION

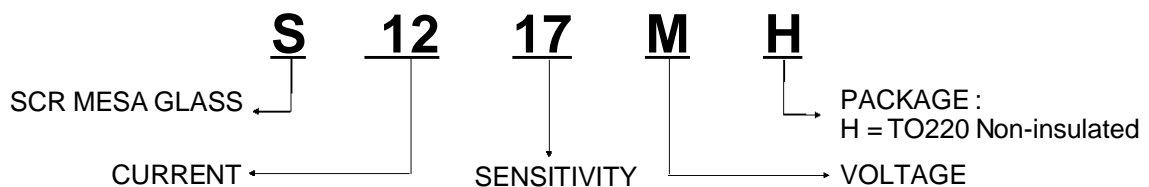


Fig.1 : Maximum average power dissipation versus average on-state current.

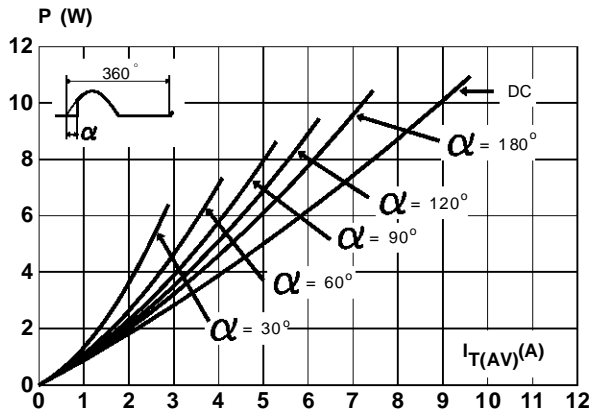


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact.

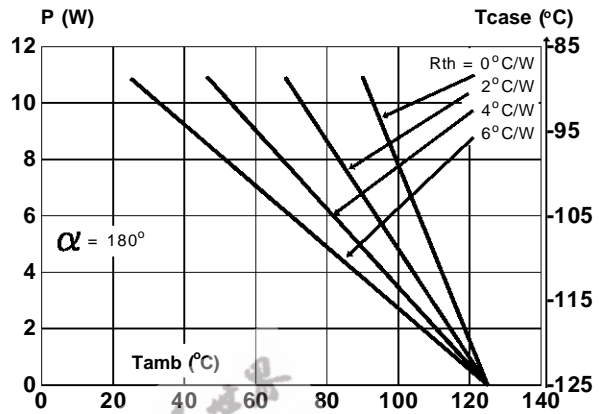


Fig.3 : Average on-state current versus case temperature.

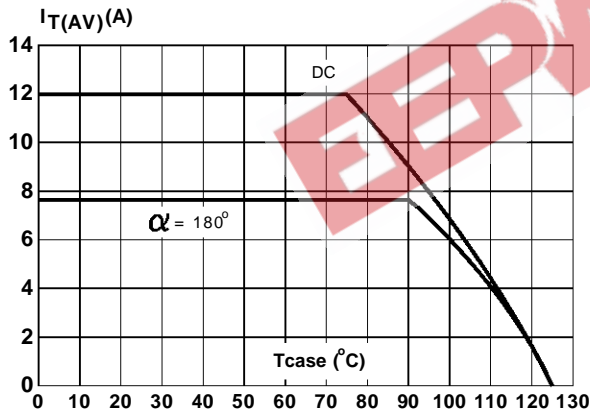


Fig.4 : Relative variation of thermal impedance versus pulse duration.

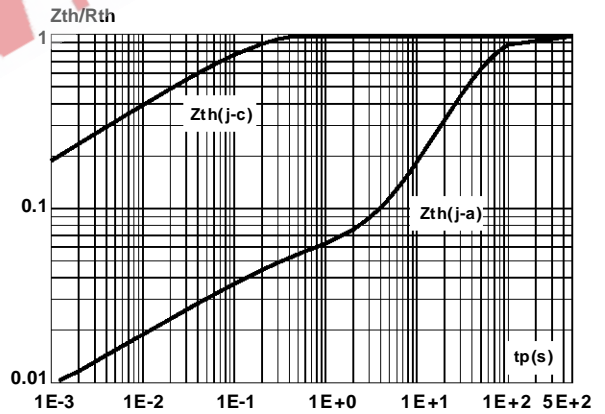


Fig.5 : Relative variation of gate trigger current and holding current versus junction temperature.

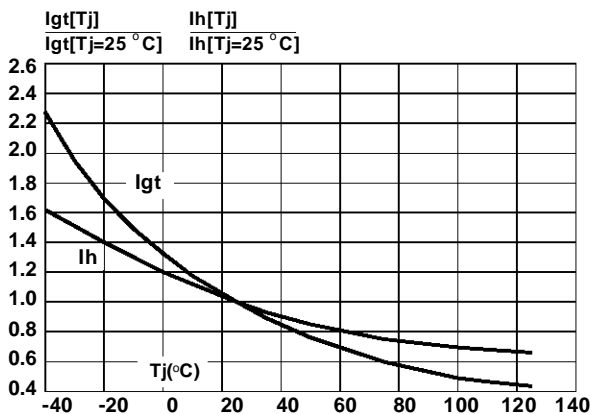
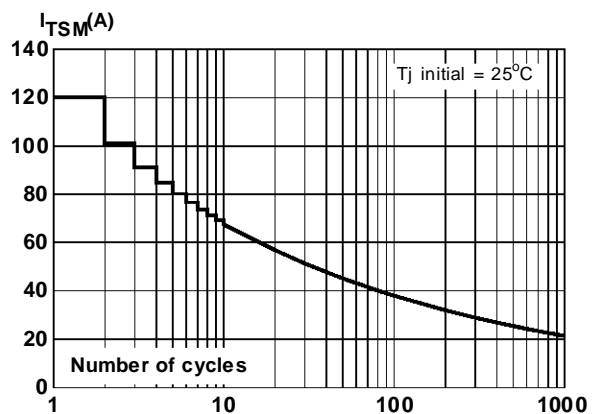


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.



S12xxxH

Fig.7 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t_p \leq 10\text{ms}$, and corresponding value of I^2t .

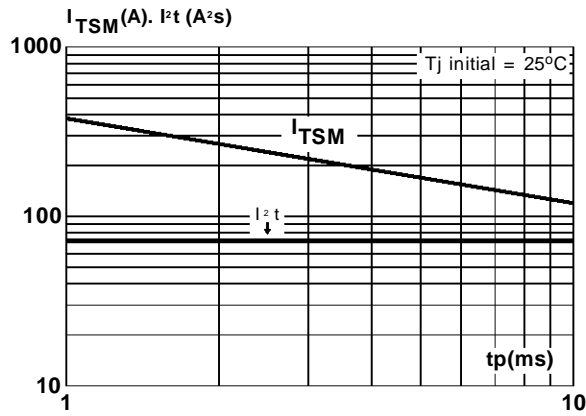
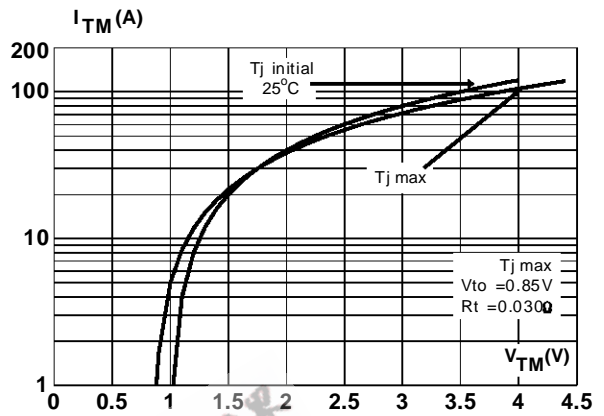


Fig.8 : On-state characteristics (maximum values).



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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

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