# THOMSON SEMICONDUCTORS

## TL 1003 ⟶ TL 8003
THYRISTORS

General purpose SCR suited for power supplies up to 400 Hz on resistive or inductive loads.

- $V_{DRM} = V_{RRM}$ up to 800 V.
- Glass passivated chip - High stability and reliability.
- High surge capability.

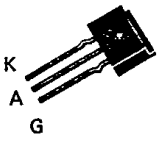
*Thyristors à usage général pour des alimentations jusqu'à 400 Hz sur charges résistives ou inductives.*

- *$V_{DRM} = V_{RRM}$ jusqu'à 800 V.*
- *Pastille glassivée - Grande stabilité des caractéristiques.*
- *Courant de surcharge élevé.*

$I_{T(RMS)} = 1{,}6$ A / $T_L = 50$ °C

$V_{DRM}$
100 V ⩽ = ⩽ 800 V
$V_{RRM}$

Case : TL (CB-274) plastic
*Boîtier*




| ABSOLUTE RATINGS (LIMITING VALUES)<br>*VALEURS LIMITES ABSOLUES D'UTILISATION* | Symbol | Value | Unit |
|---|---|---|---|
| RMS on-state current*<br>*Courant efficace à l'état passant** | $I_{T(RMS)}$ | 1,6<br>@ $T_L$ = 50°C | A |
| Mean on-state current*<br>*Courant moyen à l'état passant** | $I_{T(AV)}$ | 1<br>@ $T_L$ = 50°C | A |
| Non repetitive surge peak on-state current**<br>*Courant non répétitif de surcharge crête accidentelle à l'état passant*** | $I_{TSM}$<br>$I_{TSM}$ | 73 (t = 8,3 ms)<br>70 (t = 10 ms)<br>@ $T_j$ ⩽ 110°C | A<br>A |
| $I^2t$ for fusing<br>*Valeur de la constante $I^2t$* | $I^2t$ | 25 (t = 10 ms)<br>@ $T_j$ ⩽ 110°C | $A^2s$ |
| Critical rate of rise of on-state current***<br>*Vitesse critique de croissance du courant à l'état passant**** | di/dt | 100 | A/µs |
| Storage and operating junction temperatures<br>*Températures extrêmes de stockage et de jonction en fonctionnement* | $T_{stg}$<br>$T_j$ | − 40, + 150<br>− 40, + 110 | °C<br>°C |

| @ $T_j$ = 110°C | TL 1003 | TL 2003 | TL 4003 | TL 6003 | TL 8003 |
|---|---|---|---|---|---|
| $V_{DRM} = V_{RRM}$ (V) | 100 | 200 | 400 | 600 | 800 |

| Thermal resistances<br>*Résistances thermiques* | Symbol | Value | Unit |
|---|---|---|---|
| — Junction-leads<br>*Jonction-connexions* | $R_{th(j-l)}$ | 35 | °C/W |
| — Junction-ambient on printed circuit (with Cu 1 $cm^2$)<br>*Jonction-ambiante sur circuit imprimé (avec Cu 1 $cm^2$)* | $R_{th(j-a)}$ | 50 | °C/W |

*Single phase circuit, 180° conduction angle
**Circuit monophasé, angle de conduction 180°*

**Half-sine wave
***Demi-onde sinusoïdale*

***$I_{GT}$ = 100 mA $dI_G/dt$ = 1 A/µs

May 1984 - 1/4

**THOMSON SEMICONDUCTORS**
45, avenue de l'Europe - 78140 VÉLIZY - France
Tél. : 946.97.19 / Télex : 698 866 F



THOMSON COMPONENTS

**GATE CHARACTERISTICS (Maximum values)**
***CARACTERISTIQUES DE GACHETTE (Valeurs maximales)***

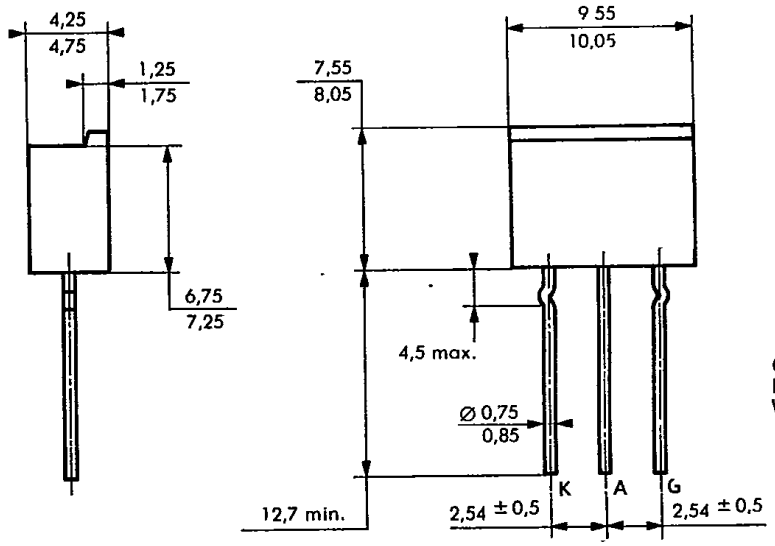
$P_{GM}$ = 20 W (t = 10 µs) $I_{FGM}$ = 1 A (t = 10 µs) $V_{RGM}$ = 5 V
$P_{G(AV)}$ = 0,1 W $V_{FGM}$ = 15 V (t = 10 µs)

**ELECTRICAL CHARACTERISTICS**
***CARACTERISTIQUES ELECTRIQUES***

| Symbol | Value | | | Unit | Test conditions | | | |
|---|---|---|---|---|---|---|---|---|
| | min | typ | max | | | | | |
| $I_{GT}$ | | | 15 | mA | $T_j$ = 25°C | $V_D$ = 12 V | $R_L$ = 33 Ω | $t_p \geq 20$ µs |
| $V_{GT}$ | | 1,2 | 3 | V | $T_j$ = 25°C | $V_D$ = 12 V | $R_L$ = 33 Ω | $t_p \geq 20$ µs |
| $V_{GD}$ | 0,2 | | | V | $T_j$ = 110°C | $V_D = V_{DRM}$ | $R_L$ = 3,3 kΩ | |
| $I_H$ | | 20 | | mA | $T_j$ = 25°C | $I_T$ = 100 mA | Gate open | |
| $V_{TM}$ | | | 1,8 | V | $T_j$ = 25°C | $I_{TM}$ = 3,2 A | $t_p$ = 10 ms | |
| $I_{DRM}$ | | | 2 | mA | $T_j$ = 110°C | $V_{DRM}$ specified | | |
| $I_{RRM}$ | | | 2 | mA | $T_j$ = 110°C | $V_{RRM}$ specified | | |
| $t_{gt}$ | | 1,5 | | µs | $T_j$ = 25°C<br>$I_G$ = 100 mA | $I_T$ = 3,2 A<br>$dI_G/dt$ = 1 A/µs | $V_D = V_{DRM}$ | |
| $t_q$ | | 80 | | µs | $T_j$ = 110°C<br>$dI_R/dt$ = 10 A/µs | $I_T$ = 1 A<br>dv/dt = 20 V/µs | $V_R$ = 10 V | $V_D$ = 0,67 $V_{DRM}$<br>Gate open |
| dv/dt* | | 100 | | V/µs | $T_j$ = 110°C | Linear slope up to 0,67 $V_{DRM}$ specified<br>Gate open | | |

*For higher guaranted values, please consult us.

**CASE DESCRIPTION**
***DESCRIPTION DU BOITIER***




TL (CB-274) plastic

Cooling method : by convection (method A)
Marking : type number
Weight : 0,8 g

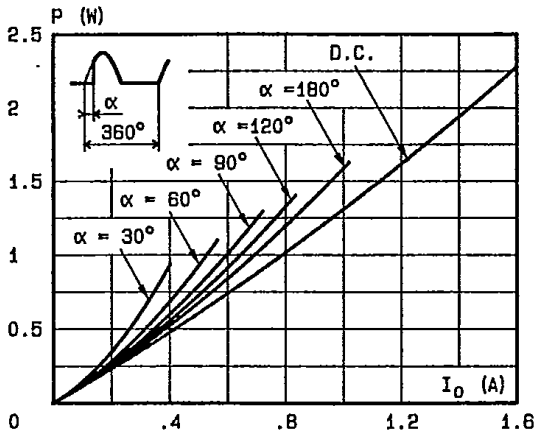



Fig.1 - Maximum mean power dissipation versus mean on-state current.

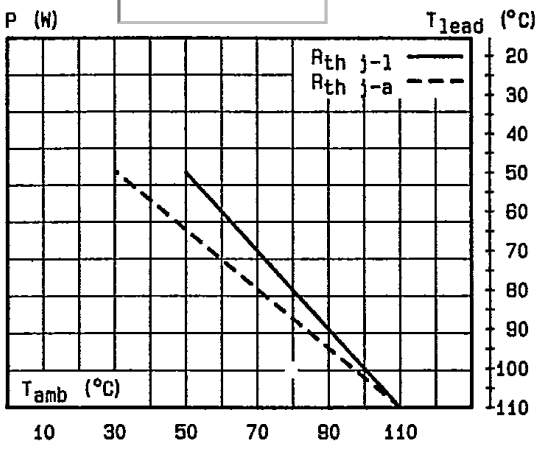



Fig.2 - Correlation between maximum mean power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{lead}$).

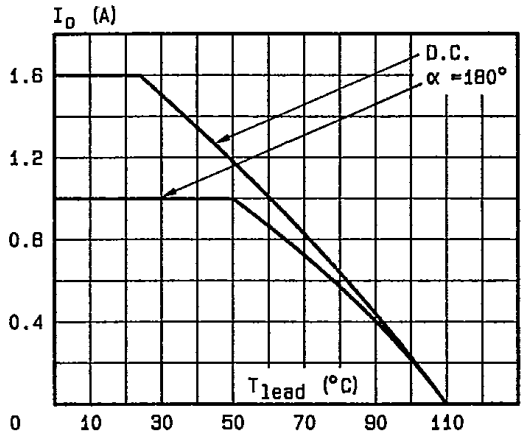



Fig.3 - Mean on-state current versus leads temperature.

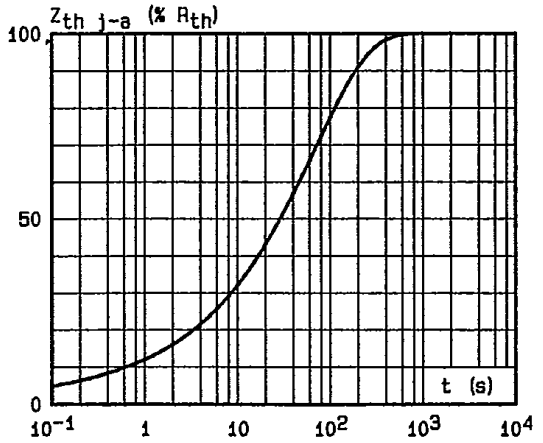



Fig.4 - Thermal transient impedance junction to ambient versus pulse duration.

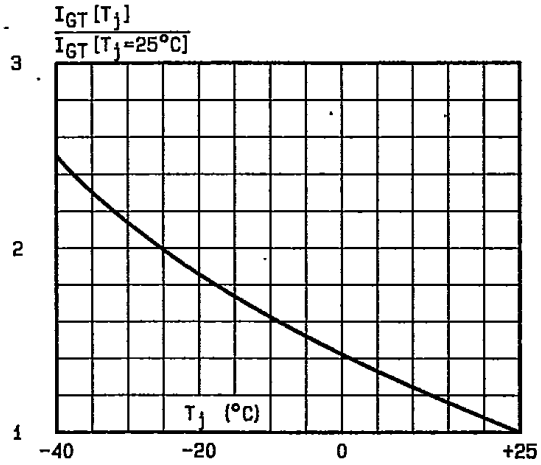



Fig.5 - Relative variation of gate trigger current versus junction temperature.

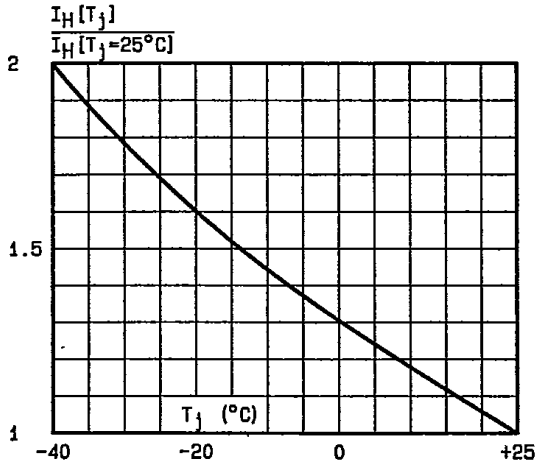



Fig.6 - Relative variation of holding current versus junction temperature.

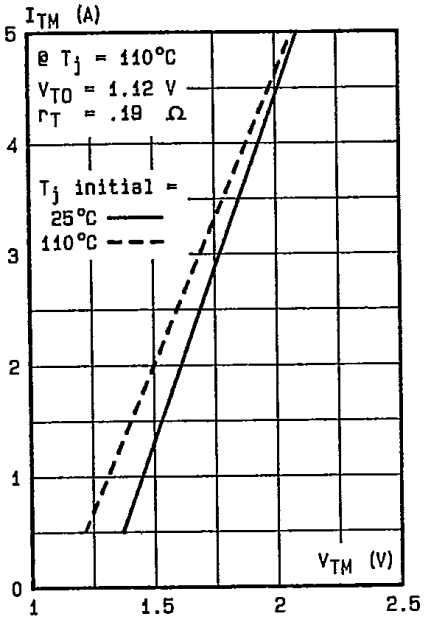



Fig.7 - On-state characteristics at low level (maximum values).

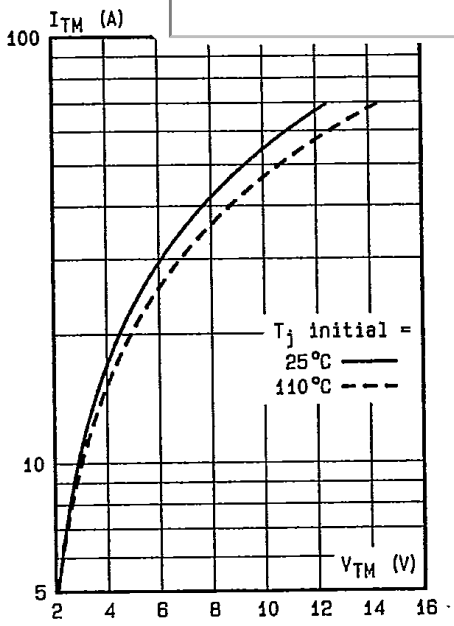



Fig.8 - On-state characteristics at high level (maximum values).

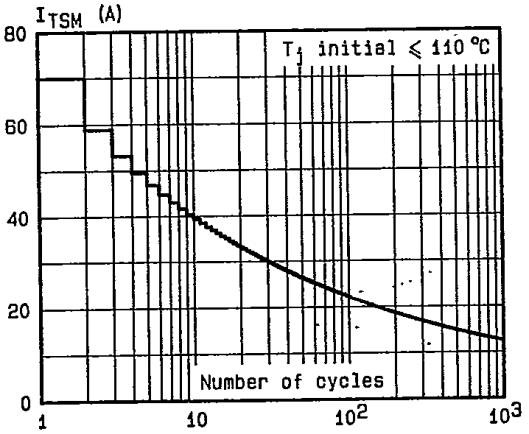



Fig.9 - Non repetitive surge peak on-state current versus number of cycles.

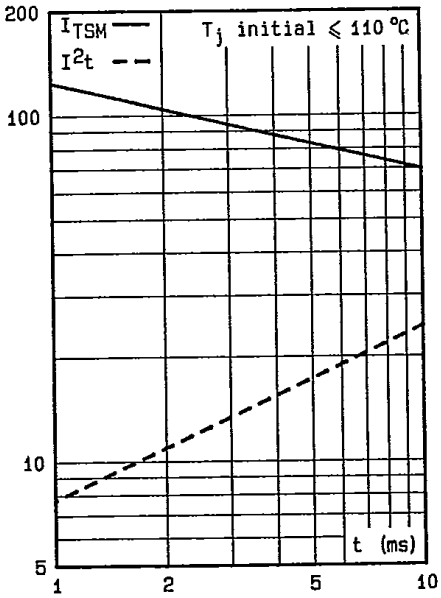



Fig.10 - Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ⩽ 10 ms, and corresponding value of $I^2t$.