# SGS-THOMSON
## MICROELECTRONICS
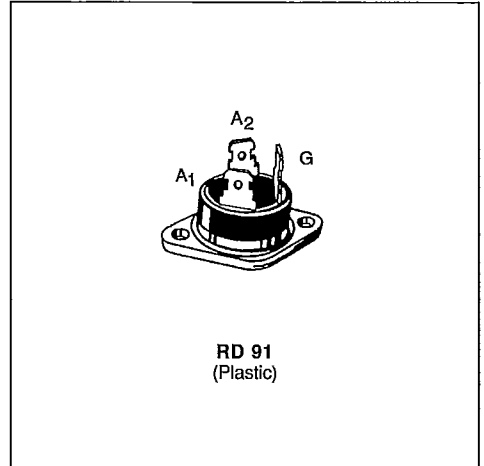
# TODV 125 → 1225

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## ALTERNISTORS

- $(di/dt)_c > 88$ A/ms (400 Hz)
- INSULATING VOLTAGE : 2500 $V_{RMS}$ ($t \le 1$ mn - F = 50 Hz)
- UL RECOGNIZED (EB1734)

### APPLICATIONS

- POWER CONTROL ON INDUCTIVE LOAD (motor, transformer...)
- HIGH FREQUENCY OR HIGH $(di/dt)_c$ LEVEL CIRCUITS



RD 91
(Plastic)

### DESCRIPTION

New range of solid state AC - switches with very high commutating capability.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state Current (360° conduction angle) | $T_C = 80$ °C | 25 | A |
| $I_{TSM}$ | Non Repetitive Surge Peak on-state Current | $t = 10$ ms | 230 | A |
| | | $t = 8.3$ ms | 250 | |
| | | $t = 2.5$ ms | 390 | |
| $I^2t$ | $I^2t$ Value for Fusing | $t = 10$ ms | 265 | $A^2s$ |
| $di/dt$ | Critical Rate of Rise of on-state Current (1) | | 100 | A/µs |
| $T_{stg}$ | Storage and Operating Junction Temperature Range | | − 40 to 125 | °C |
| $T_j$ | | | − 40 to 125 | °C |

| Symbol | Parameter | TODV | | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | 125 | 225 | 425 | 625 | 825 | 1025 | 1225 | |
| $V_{DRM}$ | Repetitive Peak off-state Voltage (2) | 100 | 200 | 400 | 600 | 800 | 1000 | 1200 | V |

(1) $I_G = 1.5$ A    $di_G/dt = 1$ A/µs
(2) $T_j = 125$ °C.

### THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th (c-h)}$ | Contact (case-heatsink) with Grease | 0.1 | °C/W |
| $R_{th (j-c)}$ DC | Junction to Case for DC | 1.6 | °C/W |
| $R_{th (j-c)}$ AC | Junction to Case for 360° Conduction Angle (F = 50 Hz) | 1.2 | °C/W |

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## GATE CHARACTERISTICS (maximum values)

$P_{GM}$ = 40 W ($t_p$ = 10 μs)     $I_{GM}$ = 8 A ($t_p$ = 10 μs)

$P_{G(AV)}$ = 1 W     $V_{GM}$ = 16 V ($t_p$ = 10 μs)

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## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Quadrants | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|
| $I_{GT}$ | $T_j$ = 25 °C     $V_D$ = 12 V     $R_L$ = 33 Ω  Pulse Duration > 20 μs | | | I-II-III | | | 150 | mA |
| $V_{GT}$ | $T_j$ = 25 °C     $V_D$ = 12 V     $R_L$ = 33 Ω  Pulse Duration > 20 μs | | | I-II-III | | | 1.5 | V |
| $V_{GD}$ | $T_j$ = 125 °C     $V_D$ = $V_{DRM}$     $R_L$ = 3.3 kΩ | | | I-II-III | 0.2 | | | V |
| $I_H$* | $T_j$ = 25 °C     $I_T$ = 500 mA     Gate Open | | | | | 50 | | mA |
| $I_L$ | $T_j$ = 25 °C     $V_D$ = 12 V     $I_G$ = 300 mA  Pulse Duration > 20 μs | | | I-III | | 50 | | mA |
| | | | | II | | 100 | | |
| $V_{TM}$* | $T_j$ = 25 °C     $I_{TM}$ = 35 A     $t_p$ = 10 ms | | | | | | 1.8 | V |
| $I_{DRM}$* | $T_j$ = 125 °C     $V_{DRM}$ Specified | | | | | | 8 | mA |
| dv/dt* | $T_j$ = 125 °C     Gate Open  Linear Slope up to $V_D$ = 67 % $V_{DRM}$ | $V_{DRM}$ ≤ 800 V | | | 500 | | | V/μs |
| | | $V_{DRM}$ ≥ 1000 V | | | 250 | | | |
| $(dI/dt)_c$* | $T_C$ = 80 °C     $V_D$ = $V_{DRM}$ | $(dv/dt)_c$ = 200 V/μs | | | 20 | | | A/ms |
| | $I_T$ = 35 A | $(dv/dt)_c$ = 10 V/μs | | | 88 | | | |
| $t_{gt}$ | $T_j$ = 25 °C     $V_D$ = $V_{DRM}$     $I_T$ = 35 A  $I_G$ = 0.5 A     $dI_G/dt$ = 3.5 A/μs | | | I-II-III | | 2.5 | | μs |

\* For either polarity of electrode $A_2$ voltage with reference to electrode $A_1$.

## PACKAGE MECHANICAL DATA : RD 91 Plastic



Ø 22 maxi
1 hole Ø 1,8 ± 0,1     6,35     2 holes for screw M3
24 maxi
15 ± 1,5
13,5 maxi     2 +1 0
30 + 0,3 − 0,1     3 maxi
33° ± 5°     38° ± 5°
27 maxi
0,8 ± 0,1     Ø 4 + 0,5 0
40 maxi     Ø 12,4 ± 1,2

Triac     1 2 3 = G $A_1$ $A_2$

Cooling method : by conduction (method C)
Marking : type number
Weight : 15 g

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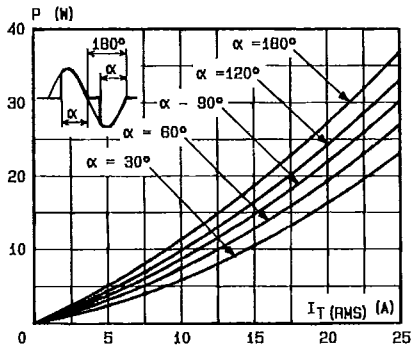MICROELECTRONICS

## S G S - T H O M S O N

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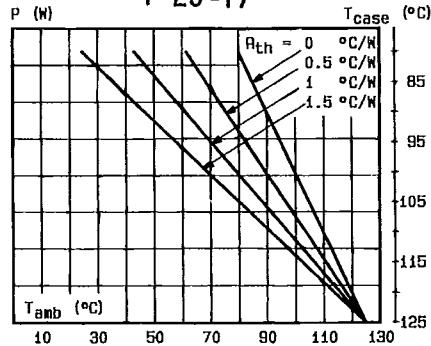Fig.1 – Maximum mean power dissipation versus RMS on-state current.



Fig.2 – Correlation between maximum mean power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact.
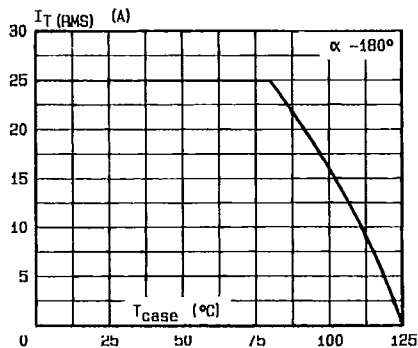


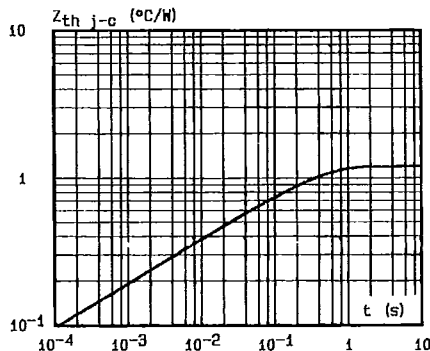Fig.3 – RMS on-state current versus case temperature.



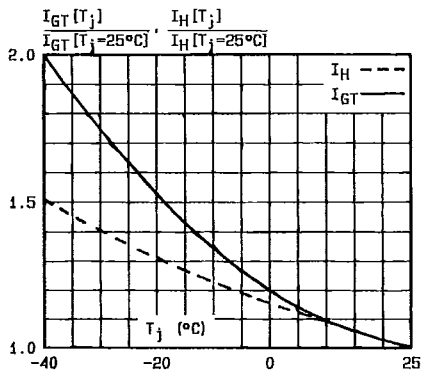Fig.4 – Thermal transient impedance junction to case versus pulse duration.



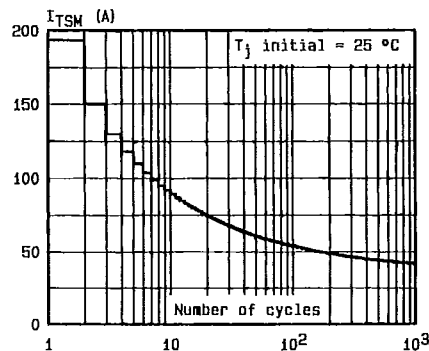Fig 5 – Relative variation of gate trigger current and holding current versus junction temperature.



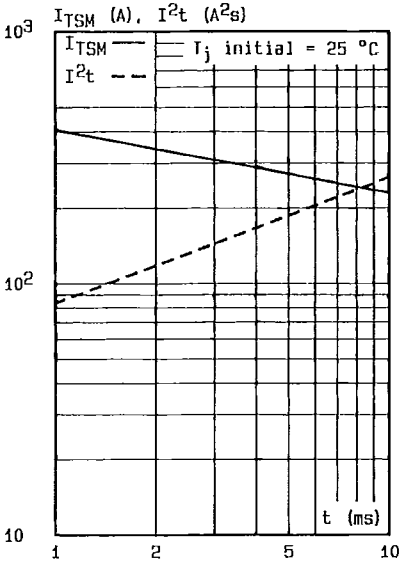Fig 6 – Non repetitive surge peak on-state current versus number of cycles.

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Fig.7 – Non repetitive surge peak
on-state current for a sinusoidal
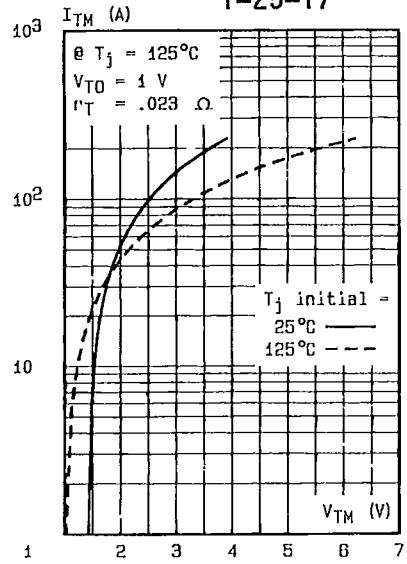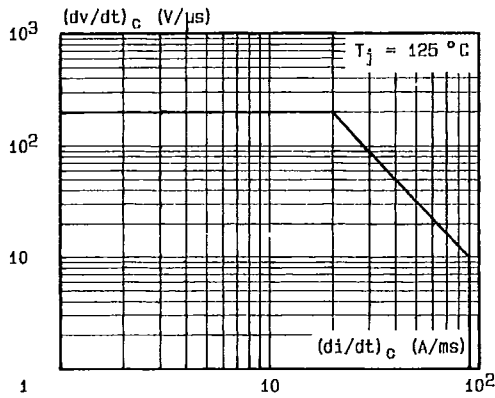pulse with width : t ⩽ 10 ms, and
corresponding value of I²t.

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



Fig.9 – Safe operating area.

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