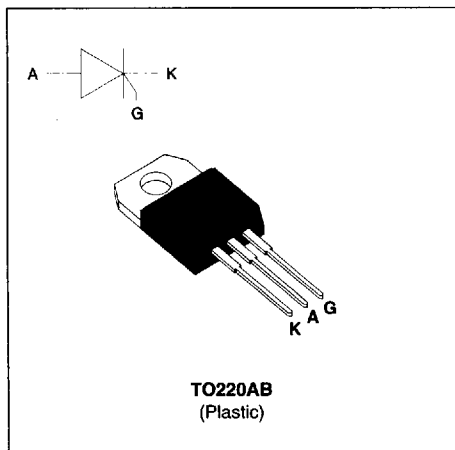


**FEATURES**

- HIGH SURGE CAPABILITY
- HIGH ON-STATE CURRENT
- HIGH STABILITY AND RELIABILITY
- TXN Serie :  
 INSULATED VOLTAGE = 2500V<sub>(RMS)</sub>  
 (UL RECOGNIZED : E81734)

**DESCRIPTION**

The TYN/TXN 0512 ---> TYN/TXN 1012 Family of Silicon Controlled Rectifiers uses a high performance glass passivated technology. This general purpose Family of Silicon Controlled Rectifiers is designed for power supplies up to 400Hz on resistive or inductive load.


**ABSOLUTE RATINGS** (limiting values)

| Symbol                             | Parameter                                                                                                       |            |                    | Value                          | Unit             |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------|--------------------|--------------------------------|------------------|
| $I_{T(RMS)}$                       | RMS on-state current<br>(180° conduction angle)                                                                 | TXN<br>TYN | Tc=80°C<br>Tc=90°C | 12                             | A                |
| $I_T(AV)$                          | Average on-state current<br>(180° conduction angle, single phase circuit)                                       | TXN<br>TYN | Tc=80°C<br>Tc=90°C | 8                              | A                |
| $I_{TSM}$                          | Non repetitive surge peak on-state current<br>(Tj initial = 25°C)                                               |            | tp=8.3 ms          | 125                            | A                |
|                                    |                                                                                                                 |            | tp=10 ms           | 120                            |                  |
| $I_{2t}$                           | $I_{2t}$ value                                                                                                  |            | tp=10 ms           | 72                             | A <sup>2</sup> s |
| di/dt                              | Critical rate of rise of on-state current<br>Gate supply : I <sub>G</sub> = 100 mA di <sub>G</sub> /dt = 1 A/μs |            |                    | 100                            | A/μs             |
| T <sub>stg</sub><br>T <sub>J</sub> | Storage and operating junction temperature range                                                                |            |                    | - 40 to + 150<br>- 40 to + 125 | °C<br>°C         |
| TI                                 | Maximum lead temperature for soldering during 10 s at 4.5 mm from case                                          |            |                    | 260                            | °C               |

| Symbol                               | Parameter                                                    | TYN/TXN |     |     |     |     |     |      | Unit |
|--------------------------------------|--------------------------------------------------------------|---------|-----|-----|-----|-----|-----|------|------|
|                                      |                                                              | 0512    | 112 | 212 | 412 | 612 | 812 | 1012 |      |
| V <sub>DRM</sub><br>V <sub>RRM</sub> | Repetitive peak off-state voltage<br>T <sub>J</sub> = 125 °C | 50      | 100 | 200 | 400 | 600 | 800 | 1000 | V    |

## THERMAL RESISTANCES

| Symbol           | Parameter               |     | Value | Unit                        |
|------------------|-------------------------|-----|-------|-----------------------------|
| $R_{th}(j-a)$    | Junction to ambient     |     | 60    | $^{\circ}\text{C}/\text{W}$ |
| $R_{th}(j-c)$ DC | Junction to case for DC | TXN | 3.5   | $^{\circ}\text{C}/\text{W}$ |
|                  |                         | TYN | 2.5   |                             |

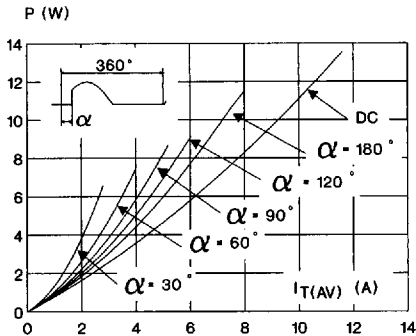
## GATE CHARACTERISTICS (maximum values)

$P_G$  (AV) = 1W    $P_{GM}$  = 10W ( $t_p$  = 20  $\mu\text{s}$ )    $I_{FGM}$  = 4A ( $t_p$  = 20  $\mu\text{s}$ )    $V_{RGM}$  = 5 V.

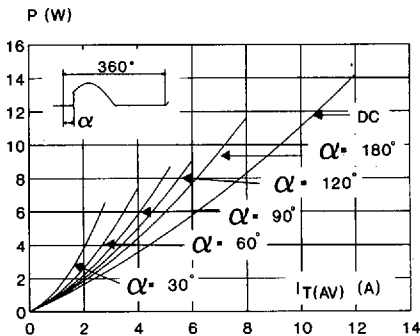
## ELECTRICAL CHARACTERISTICS

| Symbol                 | Test Conditions                                                                                                                |                           |     | Value | Unit                   |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----|-------|------------------------|
| $I_{GT}$               | $V_D=12\text{V}$ (DC) $R_L=33\Omega$                                                                                           | $T_J=25^{\circ}\text{C}$  | MAX | 15    | mA                     |
| $V_{GT}$               | $V_D=12\text{V}$ (DC) $R_L=33\Omega$                                                                                           | $T_J=25^{\circ}\text{C}$  | MAX | 1.5   | V                      |
| $V_{GD}$               | $V_D=V_{DRM}$ $R_L=3.3k\Omega$                                                                                                 | $T_J=125^{\circ}\text{C}$ | MIN | 0.2   | V                      |
| $t_{gt}$               | $V_D=V_{DRM}$ $I_G=40\text{mA}$<br>$di_G/dt=0.5\text{A}/\mu\text{s}$                                                           | $T_J=25^{\circ}\text{C}$  | TYP | 2     | $\mu\text{s}$          |
| $I_L$                  | $I_G=1.2 I_{GT}$                                                                                                               | $T_J=25^{\circ}\text{C}$  | TYP | 50    | mA                     |
| $I_H$                  | $I_T=100\text{mA}$ gate open                                                                                                   | $T_J=25^{\circ}\text{C}$  | MAX | 30    | mA                     |
| $V_{TM}$               | $I_{TM}=24\text{A}$ $t_p=380\mu\text{s}$                                                                                       | $T_J=25^{\circ}\text{C}$  | MAX | 1.6   | V                      |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ Rated<br>$V_{RRM}$ Rated                                                                                             | $T_J=25^{\circ}\text{C}$  | MAX | 0.01  | mA                     |
|                        |                                                                                                                                | $T_J=125^{\circ}\text{C}$ |     | 3     |                        |
| $dV/dt$                | Linear slope up to $V_D=67\%V_{DRM}$<br>gate open                                                                              | $T_J=125^{\circ}\text{C}$ | MIN | 200   | $\text{V}/\mu\text{s}$ |
| $t_q$                  | $V_D=67\%V_{DRM}$ $I_{TM}=24\text{A}$ $V_R=25\text{V}$<br>$di_{TM}/dt=30\text{A}/\mu\text{s}$ $dV_D/dt=50\text{V}/\mu\text{s}$ | $T_J=125^{\circ}\text{C}$ | TYP | 70    | $\mu\text{s}$          |

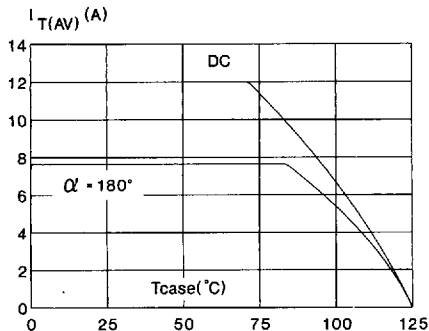
**Fig.1 :** Maximum average power dissipation versus average on-state current (TXN).



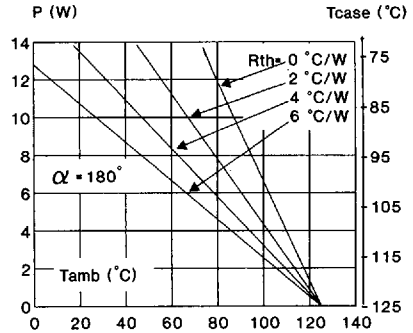
**Fig.3 :** Maximum average power dissipation versus average on-state current (TYN).



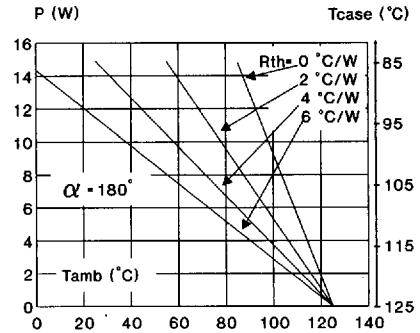
**Fig.5 :** Average on-state current versus case temperature (TXN).



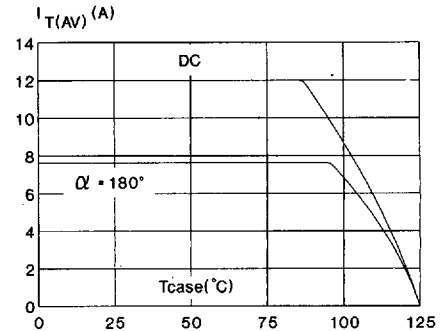
**Fig.2 :** Correlation between maximum average power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (TXN).



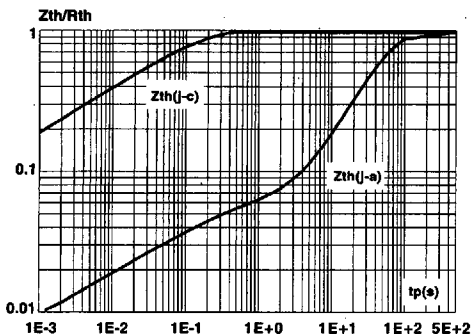
**Fig.4 :** Correlation between maximum average power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (TYN).



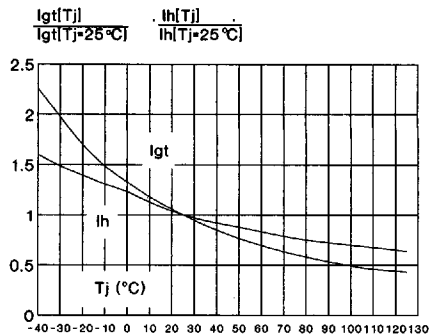
**Fig.6 :** Average on-state current versus case temperature (TYN).



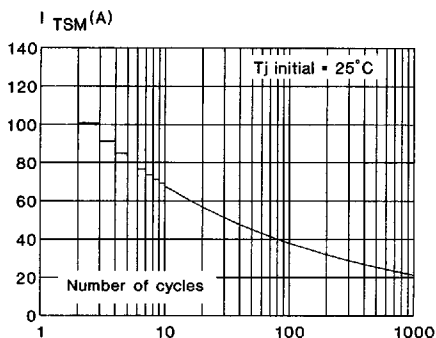
**Fig.7 :** Relative variation of thermal impedance versus pulse duration.



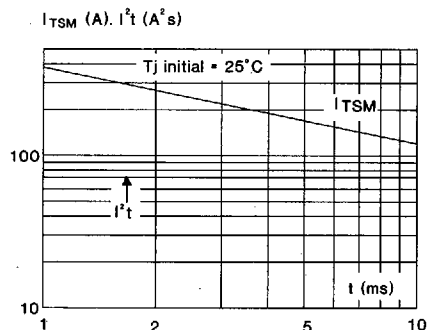
**Fig.8 :** Relative variation of gate trigger current versus junction temperature.



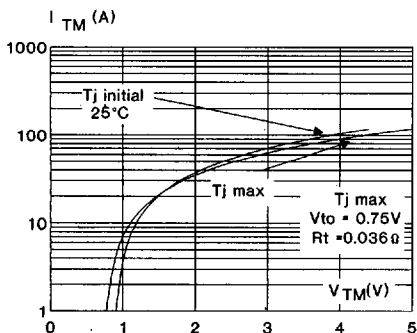
**Fig.9 :** Non repetitive surge peak on-state current versus number of cycles.



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

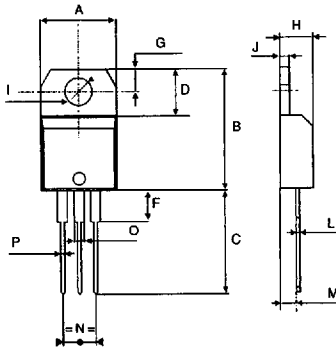


**Fig.11 :** On-state characteristics (maximum values).



## PACKAGE MECHANICAL DATA

TO220AB Plastic



| REF. | DIMENSIONS  |       |        |       |
|------|-------------|-------|--------|-------|
|      | Millimeters |       | Inches |       |
|      | Min.        | Max.  | Min.   | Max.  |
| A    | 10.00       | 10.40 | 0.393  | 0.409 |
| B    | 15.20       | 15.90 | 0.598  | 0.625 |
| C    | 13.00       | 14.00 | 0.511  | 0.551 |
| D    | 6.20        | 6.60  | 0.244  | 0.259 |
| F    | 3.50        | 4.20  | 0.137  | 0.165 |
| G    | 2.65        | 2.95  | 0.104  | 0.116 |
| H    | 4.40        | 4.60  | 0.173  | 0.181 |
| I    | 3.75        | 3.85  | 0.147  | 0.151 |
| J    | 1.23        | 1.32  | 0.048  | 0.051 |
| L    | 0.49        | 0.70  | 0.019  | 0.027 |
| M    | 2.40        | 2.72  | 0.094  | 0.107 |
| N    | 4.80        | 5.40  | 0.188  | 0.212 |
| O    | 1.14        | 1.70  | 0.044  | 0.066 |
| P    | 0.61        | 0.88  | 0.024  | 0.034 |

Cooling method : by conduction (method C)

Marking : type number

Weight : 2.3 g

Recommended torque value : 0.8 m.N.

Maximum torque value : 1 m.N.

SGS-THOMSON  
MICROELECTRONICS