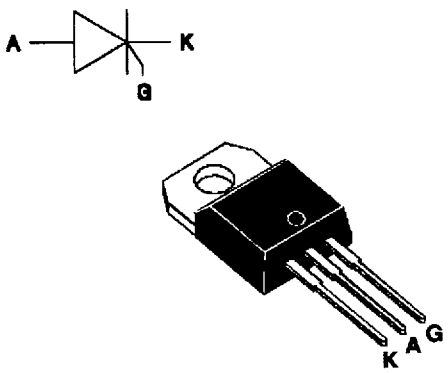
SGS-THOMSON MICROELECTRONICS

# TXN/TYN 058 (G) ---> TXN/TYN 1008 (G)

## SCR

### FEATURES

- HIGH SURGE CAPABILITY
- HIGH ON-STATE CURRENT
- HIGH STABILITY AND RELIABILITY
- TXN Serie :
  INSULATED VOLTAGE = 2500$V_{(RMS)}$
  (UL RECOGNIZED : E81734)




**TO220AB**
(Plastic)

### DESCRIPTION

The TYN/TXN 058 ---> TYN/TXN 1008 Family of Silicon Controlled Rectifiers uses a high performance glass passivated chips 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 (180° conduction angle) | TXN<br>TYN | Tc=100°C<br>Tc=105°C | 8 | A |
| $I_{T(AV)}$ | Average on-state current (180° conduction angle,single phase circuit) | TXN<br>TYN | Tc=100°C<br>Tc=105°C | 5 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current ( Tj initial = 25°C ) | | tp=8.3 ms | 84 | A |
| | | | tp=10 ms | 80 | |
| $I^2t$ | $I^2t$ value | | tp=10 ms | 32 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current Gate supply : $I_G$ = 100 mA $di_G/dt$ = 1 A/µs | | | 50 | A/µs |
| Tstg<br>Tj | Storage and operating junction temperature range | | | - 40 to + 150<br>- 40 to + 125 | °C<br>°C |
| Tl | Maximum lead temperature for soldering during 10 s at 4.5 mm from case | | | 260 | °C |

| Symbol | Parameter | TYN/TXN | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | 058 | 108 | 208 | 408 | 608 | 808 | 1008 | |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage Tj = 125 °C | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |

## THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| Rth (j-a) | Junction to ambient | | 60 | °C/W |
| Rth (j-c) DC | Junction to case for DC | TXN | 3.5 | °C/W |
| | | TYN | 2.5 | |

## GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$ = 1W $P_{GM}$ = 10W (tp = 20 µs) $I_{FGM}$ = 4A (tp = 20 µs) $V_{RGM}$ = 5 V.

## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Value | | Unit |
|---|---|---|---|---|---|---|
| | | | | BLANK | G | |
| $I_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj=25°C | MAX | 15 | 25 | mA |
| $V_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω | Tj=25°C | MAX | 1.5 | | V |
| $V_{GD}$ | $V_D$=$V_{DRM}$ $R_L$=3.3kΩ | Tj= 110°C | MIN | 0.2 | | V |
| tgt | $V_D$=$V_{DRM}$ $I_G$ = 40mA<br>$dI_G/dt$ = 0.5A/µs | Tj=25°C | TYP | 2 | | µs |
| $I_L$ | $I_G$= 1.2 $I_{GT}$ | Tj=25°C | TYP | 50 | | mA |
| $I_H$ | $I_T$= 100mA gate open | Tj=25°C | MAX | 30 | 45 | mA |
| $V_{TM}$ | ITM= 16A tp= 380µs | Tj=25°C | MAX | 1.8 | | V |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ Rated<br>$V_{RRM}$ Rated | Tj=25°C | MAX | 0.01 | | mA |
| | | Tj= 110°C | | 2 | | |
| dV/dt | Linear slope up to $V_D$=67%$V_{DRM}$<br>gate open | Tj= 110°C | MIN | 200 | 500 | V/µs |
| tq | $V_D$=67%$V_{DRM}$ $I_{TM}$= 16A $V_R$= 25V<br>$dI_{TM}/dt$=30 A/µs $dV_D/dt$= 50V/µs | Tj= 110°C | TYP | 70 | | µs |

| Package | $I_{T(RMS)}$ | $V_{DRM}$ / $V_{RRM}$ | Sensitivity Specification | |
|---|---|---|---|---|
| | A | V | BLANK | G |
| TXN (Insulated) | 8 | 50 | X | X |
| | | 100 | X | X |
| | | 200 | X | X |
| | | 400 | X | X |
| | | 600 | X | X |
| | | 800 | X | X |
| | | 1000 | X | X |
| TYN (Uninsulated) | | 50 | X | X |
| | | 100 | X | X |
| | | 200 | X | X |
| | | 400 | X | X |
| | | 600 | X | X |
| | | 800 | X | X |
| | | 1000 | X | X |

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

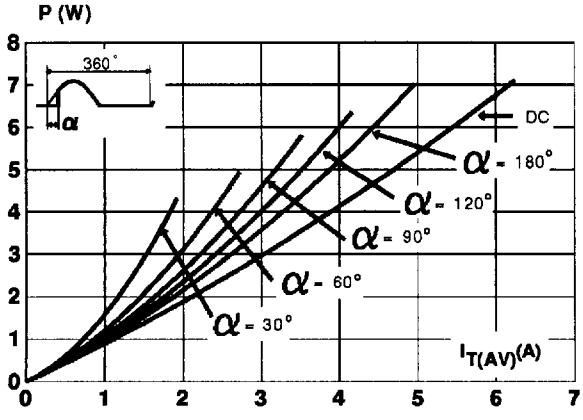



**Fig.2** : Correlation between maximum average power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact (TXN).

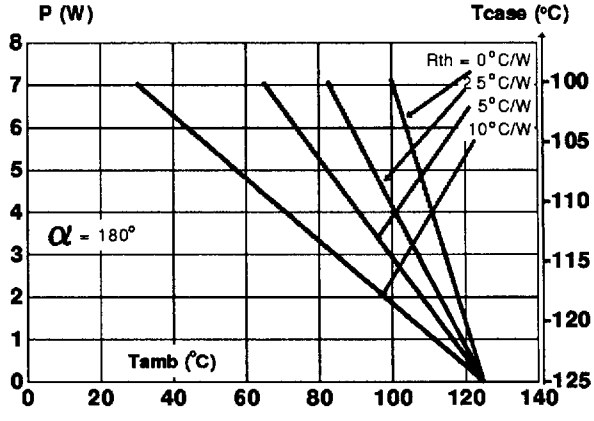



**Fig.3** : Maximum average power dissipation versus average on-state current (TYN).

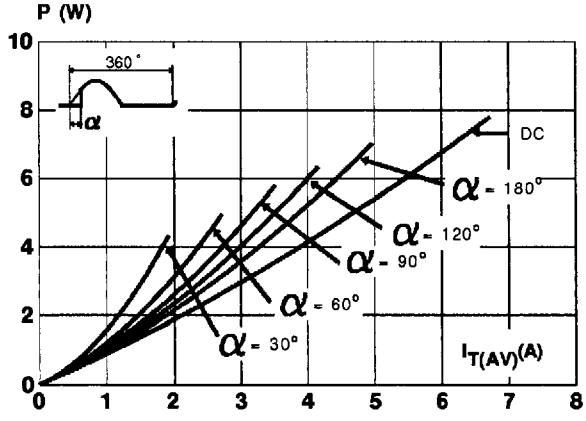



**Fig.4** : Correlation between maximum average power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact (TYN).

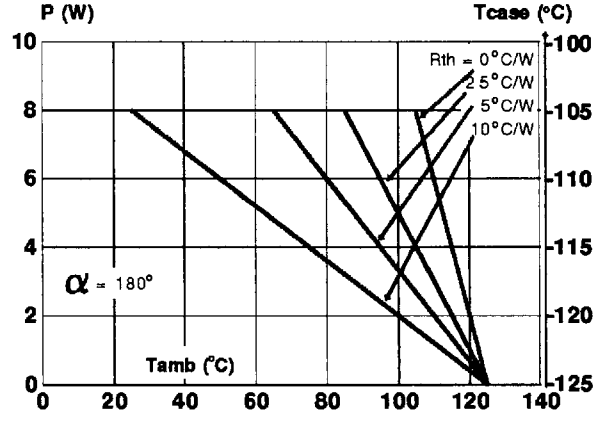


**Fig.5** : Average on-state current versus case temperature (TXN).

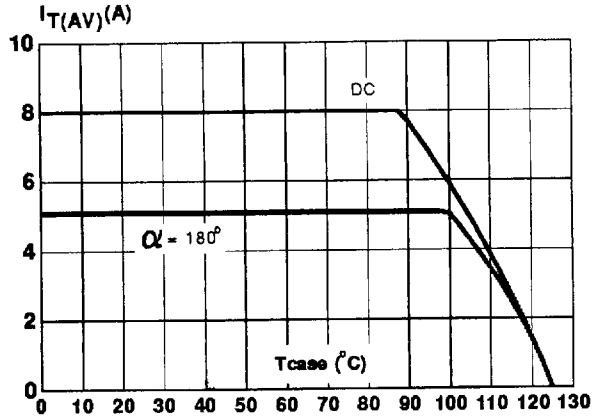



**Fig.6** : Average on-state current versus case temperature (TYN).

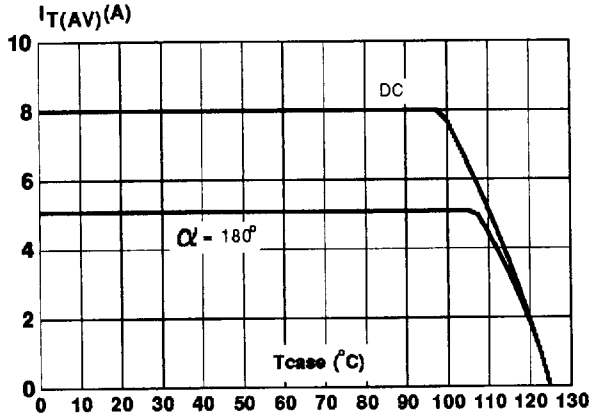



**Fig.7** : Relative variation of thermal impedance versus pulse duration.

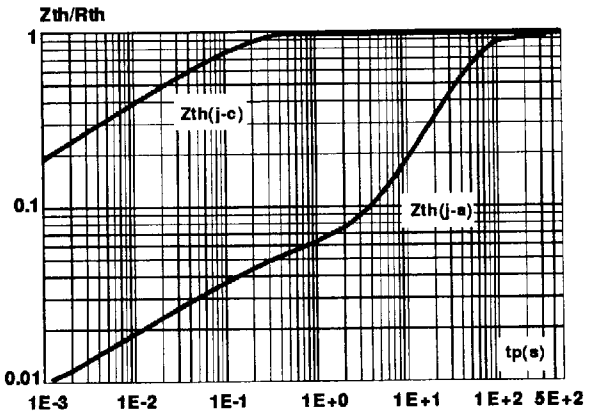



**Fig.8** : Relative variation of gate trigger current versus junction temperature.

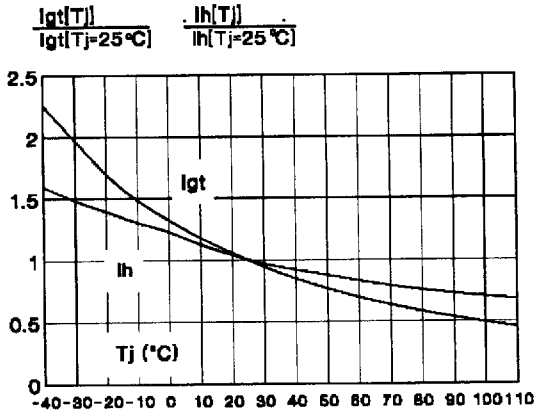



**Fig.9** : Non repetitive surge peak on-state current versus number of cycles.

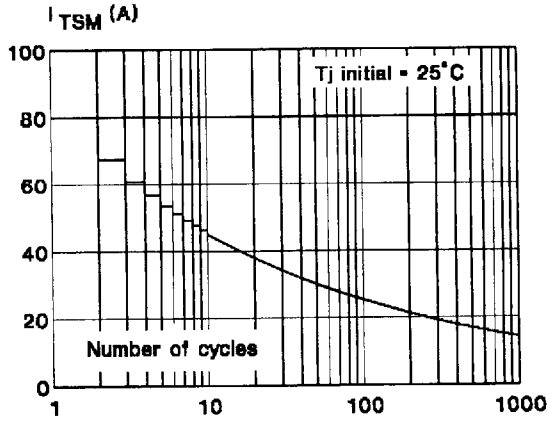



**Fig.10** : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t \leq 10$ ms, and corresponding value of $I^2t$.

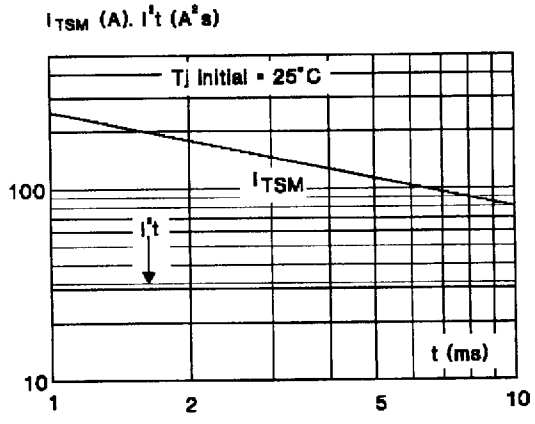
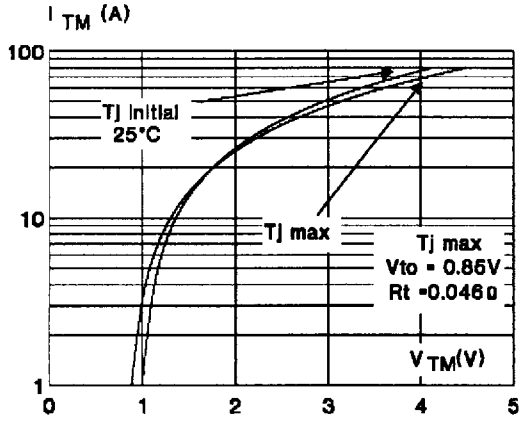
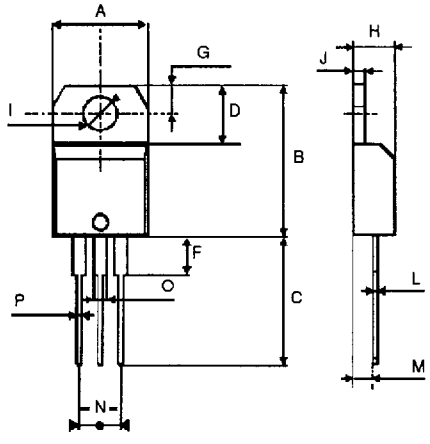


**Fig.11 :** On-state characteristics (maximum values).




## 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 : C
Marking : type number
Weight : 2.3 g

Recommended torque value : 0.8 m.N.
Maximum torque value : 1 m.N.