

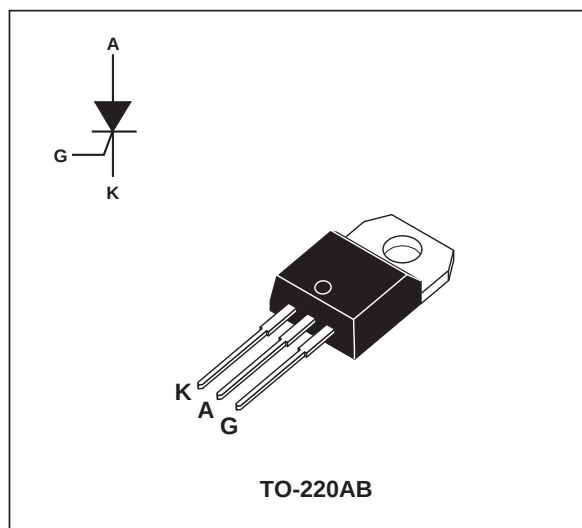
### FEATURES

- High surge capability
- High on-state current
- High stability and reliability

### DESCRIPTION

The TYN606 and TYN1006 Family of Silicon Controlled Rectifiers are high performance glass passivated technology.

This general purpose Family of Silicon Controlled Rectifiers is designed for power supply 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)                                                                     | $T_c = 110^{\circ}\text{C}$ | 6                          | A                      |
| $I_{T(AV)}$        | Average on-state current (180° conduction angle, single phase circuit)                                           | $T_c = 110^{\circ}\text{C}$ | 3.8                        | A                      |
| $I_{TSM}$          | Non repetitive surge peak on-state current ( $T_j$ initial = $25^{\circ}\text{C}$ )                              | $t_p = 8.3\text{ms}$        | 73                         | A                      |
|                    |                                                                                                                  | $t_p = 10\text{ms}$         | 70                         |                        |
| $I^2t$             | $I^2t$ value                                                                                                     | $t_p = 10\text{ms}$         | 24.5                       | $\text{A}^2\text{s}$   |
| $dI/dt$            | Critical rate of rise of on-state current<br>Gate supply: $I_G = 100\text{mA}$ $dI_G/dt = 1\text{A}/\mu\text{s}$ |                             | 50                         | $\text{A}/\mu\text{s}$ |
| $T_{stg}$<br>$T_j$ | Storage and operating junction temperature range                                                                 |                             | -40 to +150<br>-40 to +125 | $^{\circ}\text{C}$     |
| TI                 | Maximum lead soldering temperature during 10s at 4.5mm from case                                                 |                             | 260                        | $^{\circ}\text{C}$     |

| Symbol                 | Parameter                                                        | TYN |      | Unit |
|------------------------|------------------------------------------------------------------|-----|------|------|
|                        |                                                                  | 606 | 1006 |      |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage<br>$T_j = 125^{\circ}\text{C}$ | 600 | 1000 | V    |

## THERMAL RESISTANCE

| Symbol                   | Parameter               | Value | Unit |
|--------------------------|-------------------------|-------|------|
| R <sub>th</sub> (j-a)    | Junction to ambient     | 60    | °C/W |
| R <sub>th</sub> (j-c) DC | Junction to case for DC | 2.5   | °C/W |

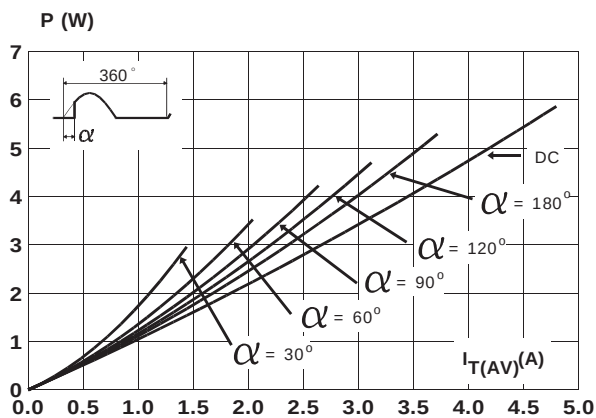
## GATE CHARACTERISTICS (maximum values)

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

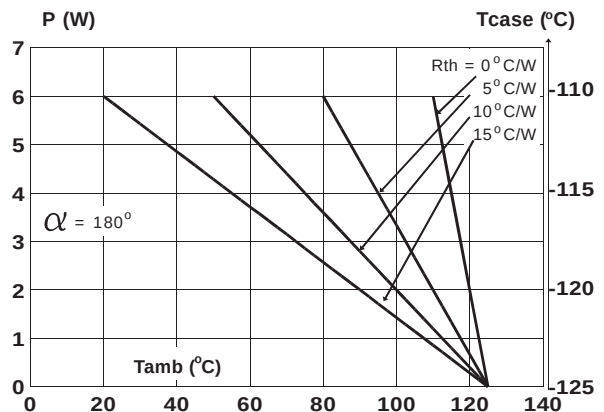
## ELECTRICAL CHARACTERISTICS

| Symbol                 | Test conditions                                                                                                         | Value                    | Unit       |
|------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------|------------|
| $I_{GT}$               | $V_D = 12V$ (DC) $R_L = 33\Omega$ $T_j = 25^\circ C$ MAX.                                                               | 15                       | mA         |
| $V_{GT}$               | $V_D = 12V$ (DC) $R_L = 33\Omega$ $T_j = 25^\circ C$ MAX.                                                               | 1.5                      | V          |
| $V_{GD}$               | $V_D = V_{DRM}$ $R_L = 3.3k\Omega$ $T_j = 110^\circ C$ MIN.                                                             | 0.2                      | V          |
| tgt                    | $V_D = V_{DRM}$ $I_G = 40mA$ $dI_G/dt = 0.5A/\mu s$ $T_j = 25^\circ C$ TYP.                                             | 2                        | $\mu s$    |
| $I_L$                  | $I_G = 1.2I_{GT}$ $T_j = 25^\circ C$ TYP.                                                                               | 50                       | mA         |
| $I_H$                  | $I_T = 100mA$ Gate open $T_j = 25^\circ C$ MAX.                                                                         | 30                       | mA         |
| $V_{TM}$               | $I_{TM} = 12A$ $t_p = 380\mu s$ $T_j = 25^\circ C$ MAX.                                                                 | 1.6                      | V          |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ rated<br>$V_{RRM}$ rated                                                                                      | $T_j = 25^\circ C$ MAX.  | mA         |
|                        |                                                                                                                         | $T_j = 110^\circ C$ MAX. |            |
| dV/dt                  | Linear slope up to $V_D = 67\% V_{DRM}$ gate open $T_j = 110^\circ C$ MIN.                                              | 200                      | V/ $\mu s$ |
| tq                     | $V_D = 67\% V_{DRM}$ $I_{TM} = 12A$ $V_R = 25V$ $dI_{TM}/dt = 30A/\mu s$ $dV_D/dt = 50V/\mu s$ $T_j = 110^\circ C$ TYP. | 70                       | $\mu s$    |

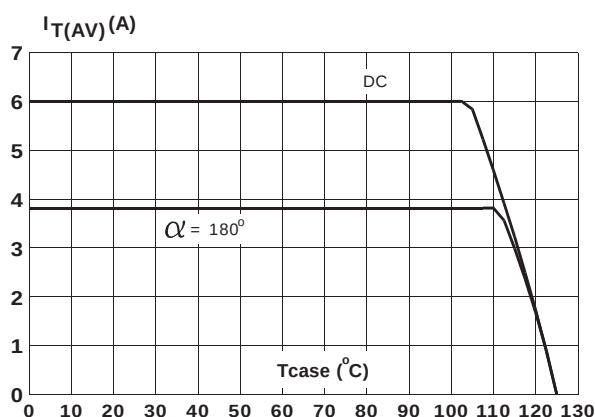
**Fig. 1:** Maximum average power dissipation versus average on-state current.



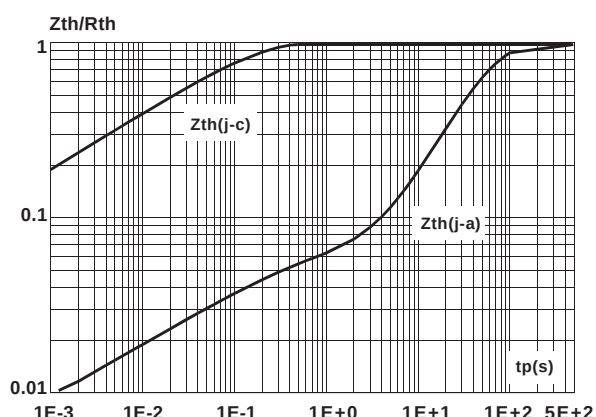
**Fig. 2:** Correlation between maximum average power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact.



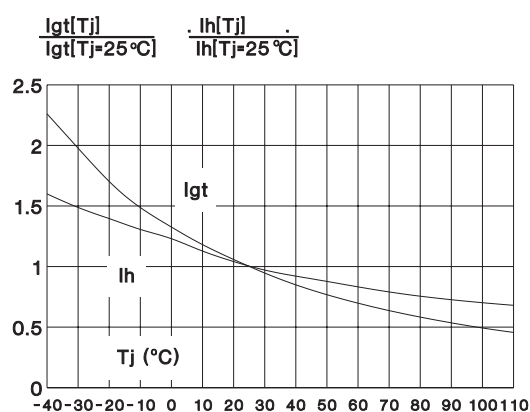
**Fig. 3:** Average on-state current versus case temperature.



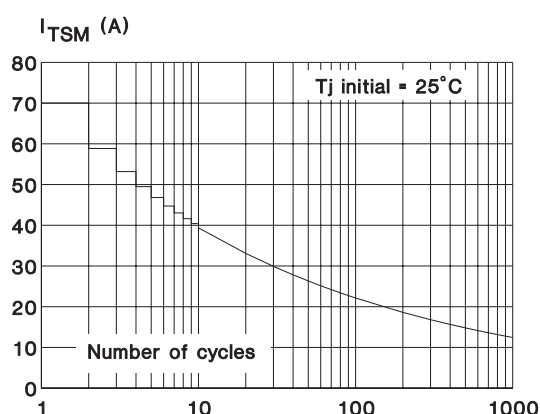
**Fig. 4:** Relative variation of thermal impedance versus pulse duration.



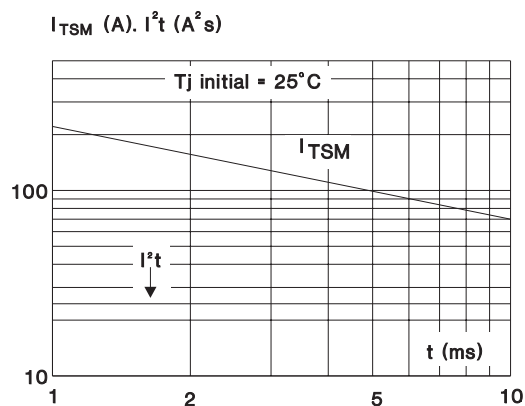
**Fig. 5:** Relative variation of gate trigger current versus junction temperature.



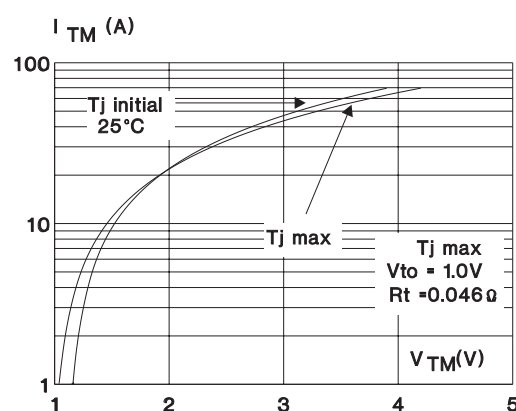
**Fig. 6:** Non repetitive surge peak on-state current versus number of cycles.



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



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



**PACKAGE MECHANICAL DATA**  
TO-220AB (Plastic)

| REF. | DIMENSIONS  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| A    | 15.20       |       | 15.90 | 0.598  |       | 0.625 |
| a1   |             | 3.75  |       |        | 0.147 |       |
| a2   | 13.00       |       | 14.00 | 0.511  |       | 0.551 |
| B    | 10.00       |       | 10.40 | 0.393  |       | 0.409 |
| b1   | 0.61        |       | 0.88  | 0.024  |       | 0.034 |
| b2   | 1.23        |       | 1.32  | 0.048  |       | 0.051 |
| C    | 4.40        |       | 4.60  | 0.173  |       | 0.181 |
| c1   | 0.49        |       | 0.70  | 0.019  |       | 0.027 |
| c2   | 2.40        |       | 2.72  | 0.094  |       | 0.107 |
| e    | 2.40        |       | 2.70  | 0.094  |       | 0.106 |
| F    | 6.20        |       | 6.60  | 0.244  |       | 0.259 |
| I    | 3.75        |       | 3.85  | 0.147  |       | 0.151 |
| I4   | 15.80       | 16.40 | 16.80 | 0.622  | 0.646 | 0.661 |
| L    | 2.65        |       | 2.95  | 0.104  |       | 0.116 |
| I2   | 1.14        |       | 1.70  | 0.044  |       | 0.066 |
| I3   | 1.14        |       | 1.70  | 0.044  |       | 0.066 |
| M    |             | 2.60  |       |        | 0.102 |       |

**OTHER INFORMATION**

| Ordering type | Marking | Package  | Weight | Base qty | Delivery mode |
|---------------|---------|----------|--------|----------|---------------|
| TYNxx06       | TYNxx06 | TO-220AB | 2.3 g  | 250      | Bulk          |

- Epoxy meets UL94,V0
- Cooling method: C
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.

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