

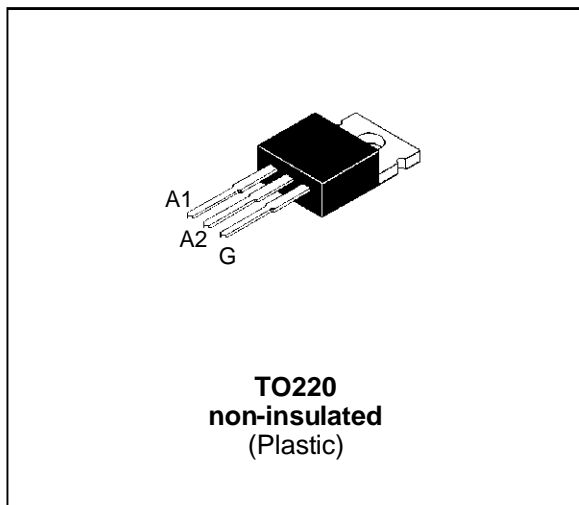
**SENSITIVE GATE TRIACS**

**FEATURES**

- $I_{T(RMS)} = 5A$
- $V_{DRM} = 400V$  to  $800V$
- $I_{GT} \leq 5mA$  to  $\leq 10mA$

**DESCRIPTION**

The T05xxxH series of triacs uses a high performance MESA GLASS technology. These parts are intended for general purpose applications where gate high sensitivity is required.



**ABSOLUTE RATINGS** (limiting values)

| Symbol             | Parameter  |                                   | Value                      | Unit             |
|--------------------|--|-----------------------------------|----------------------------|------------------|
| $I_{T(RMS)}$       | RMS on-state current<br>(360° conduction angle)  | $T_c = 100\text{ }^\circ\text{C}$ | 5                          | A                |
| $I_{TSM}$          | Non repetitive surge peak on-state current<br>( $T_j$ initial = $25^\circ\text{C}$ )                     | $t_p = 8.3\text{ ms}$             | 42                         | A                |
|                    |  | $t_p = 10\text{ ms}$              | 40                         |                  |
| $I^2t$             | $I^2t$ Value for fusing  | $t_p = 10\text{ ms}$              | 8                          | $A^2s$           |
| $di/dt$            | Critical rate of rise of on-state current<br>$I_G = 50\text{ mA}$ $di_G/dt = 0.1\text{ A}/\mu\text{s}$ . | Repetitive<br>$F = 50\text{ Hz}$  | 10                         | $A/\mu\text{s}$  |
|                    |  | Non Repetitive                    | 50                         |                  |
| $T_{stg}$<br>$T_j$ | Storage and operating junction temperature range   |                                   | - 40, + 150<br>- 40, + 125 | $^\circ\text{C}$ |
| $T_l$              | Maximum lead temperature for soldering during 10s at 4.5mm from case                                     |                                   | 260                        | $^\circ\text{C}$ |

| Symbol                 | Parameter  | Voltage |     |     |     | Unit |
|------------------------|--|---------|-----|-----|-----|------|
|                        |  | D       | M   | S   | N   |      |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage<br>$T_j = 125^\circ\text{C}$ | 400     | 600 | 700 | 800 | V    |

## T0505xH / T0509xH

### THERMAL RESISTANCES

| Symbol   | Parameter   | Value | Unit |
|----------|---|-------|------|
| Rth(j-a) | Junction to ambient                                     | 60    | °C/W |
| Rth(j-c) | Junction to case for D.C                                | 5.3   | °C/W |
| Rth(j-c) | Junction to case for A.C 360° conduction angle (F=50Hz) | 4     | °C/W |

### GATE CHARACTERISTICS (maximum values)

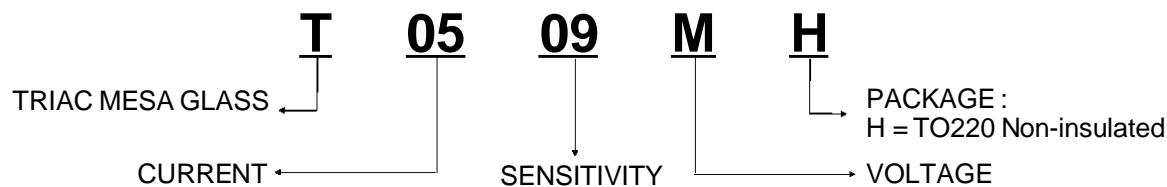
$P_G (AV) = 1 \text{ W}$   $P_{GM} = 10 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )  $I_{GM} = 4 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )

### ELECTRICAL CHARACTERISTICS

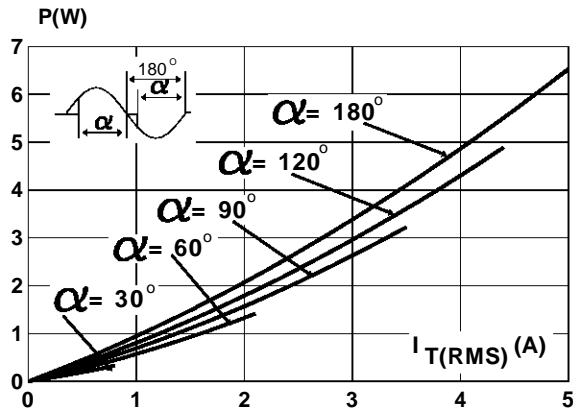
| Symbol                 | Test Conditions  | Quadrant    |     | Sensitivity |    | Unit             |
|------------------------|--|-------------|-----|-------------|----|------------------|
|                        |  |             |     | 05          | 09 |                  |
| $I_{GT}$               | $V_D = 12\text{V (DC)}$ $R_L = 33\Omega$ $T_j = 25^\circ\text{C}$  | I-II-III-IV | MAX | 5           | 10 | mA               |
| $V_{GT}$               | $V_D = 12\text{V (DC)}$ $R_L = 33\Omega$ $T_j = 25^\circ\text{C}$  | I-II-III-IV | MAX | 1.5         |    | V                |
| $V_{GD}$               | $V_D = V_{DRM}$ $R_L = 3.3\text{k}\Omega$ $T_j = 125^\circ\text{C}$  | I-II-III-IV | MIN | 0.2         |    | V                |
| tgt                    | $V_D = V_{DRM}$ $I_G = 40\text{mA}$<br>$I_T = 7.1\text{A}$<br>$di_G/dt = 0.5\text{A}/\mu\text{s}$ $T_j = 25^\circ\text{C}$ | I-II-III-IV | TYP | 2           |    | $\mu\text{s}$    |
| $I_H^*$                | $I_T = 50\text{mA}$ Gate open $T_j = 25^\circ\text{C}$   |             | MAX | 5           | 10 | mA               |
| $I_L$                  | $I_G = 1.2 I_{GT}$ $T_j = 25^\circ\text{C}$  | I-III-IV    | TYP | 5           | 10 | mA               |
|                        |  | II          | TYP | 10          | 20 |                  |
| $V_{TM}^*$             | $I_{TM} = 7.1\text{A}$ $t_p = 380\mu\text{s}$ $T_j = 25^\circ\text{C}$   |             | MAX | 1.65        |    | V                |
| $I_{DRM}$<br>$I_{RRM}$ | $V_D = V_{DRM}$<br>$V_R = V_{RRM}$ $T_j = 25^\circ\text{C}$  |             | MAX | 5           |    | $\mu\text{A}$    |
|                        |  |             | MAX | 1.5         |    | mA               |
| dV/dt *                | $V_D = 67\% V_{DRM}$<br>Gate open $T_j = 110^\circ\text{C}$  |             | MIN |             | 20 | V/ $\mu\text{s}$ |
|                        |  |             | TYP | 10          |    |                  |
| (dV/dt)c *             | (di/dt)c = 2.2 A/ms $T_j = 110^\circ\text{C}$  |             | TYP | 1           | 2  | V/ $\mu\text{s}$ |

\* For either polarity of electrode A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>

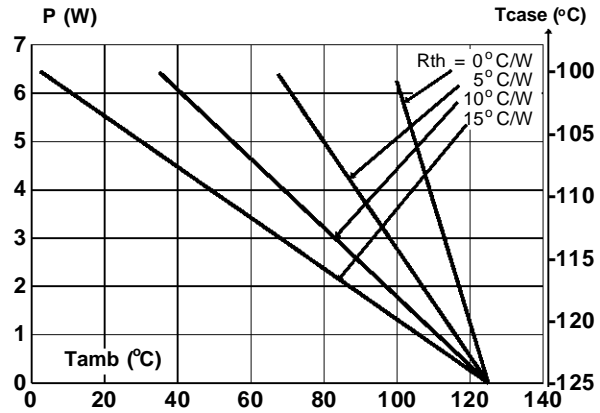
### ORDERING INFORMATION



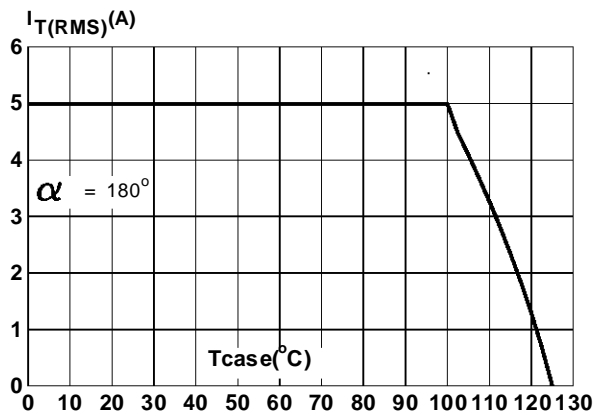
**Fig.1 :** Maximum RMS power dissipation versus RMS on-state current.



**Fig.2 :** Correlation between maximum RMS power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact.



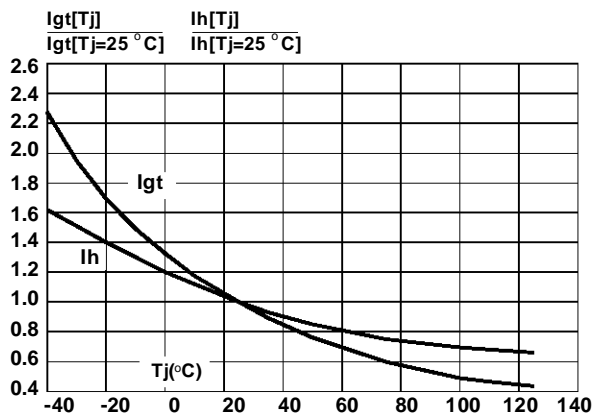
**Fig.3 :** RMS on-state current versus case temperature.



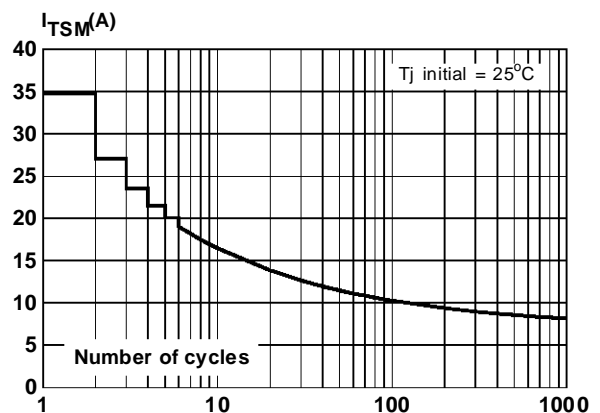
**Fig.4 :** Relative variation of thermal impedance versus pulse duration.



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

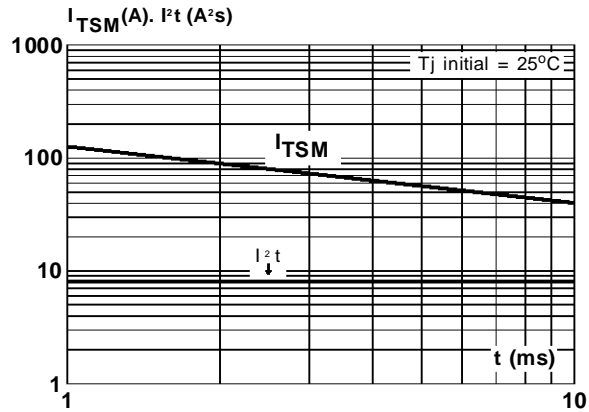


**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

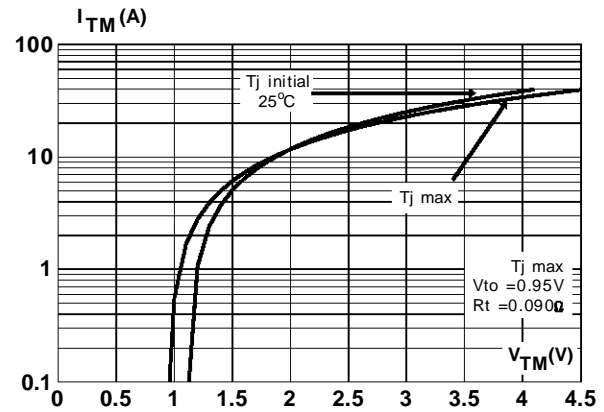


## T0505xH / T0509xH

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



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



**PACKAGE MECHANICAL DATA**  
TO220 Non-insulated (Plastic)

| REF. | DIMENSIONS  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Typ.        | Min. | Max. | Typ.   | Min.  | Max.  |
| A    |             |      | 10.3 |        |       | 0.406 |
| B    |             | 6.3  | 6.5  | 0.248  | 0.256 |       |
| C    |             |      | 9.1  |        |       | 0.358 |
| D    |             | 12.7 |      |        | 0.500 |       |
| F    |             |      | 4.2  |        |       | 0.165 |
| G    |             |      | 3.0  |        |       | 0.118 |
| H    |             | 4.5  | 4.7  |        | 0.177 | 0.185 |
| I    |             | 3.53 | 3.66 |        | 0.139 | 0.144 |
| J    |             | 1.2  | 1.3  |        | 0.047 | 0.051 |
| L    |             |      | 0.9  |        |       | 0.035 |
| M    | 2.7         |      |      | 0.106  |       |       |
| N    |             |      | 5.3  |        |       | 0.209 |
| N1   | 2.54        |      |      | 0.100  |       |       |
| O    |             | 1.2  | 1.4  |        | 0.047 | 0.055 |
| P    |             |      | 1.15 |        |       | 0.045 |

Marking : type number  
Weight : 1.8 g

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