

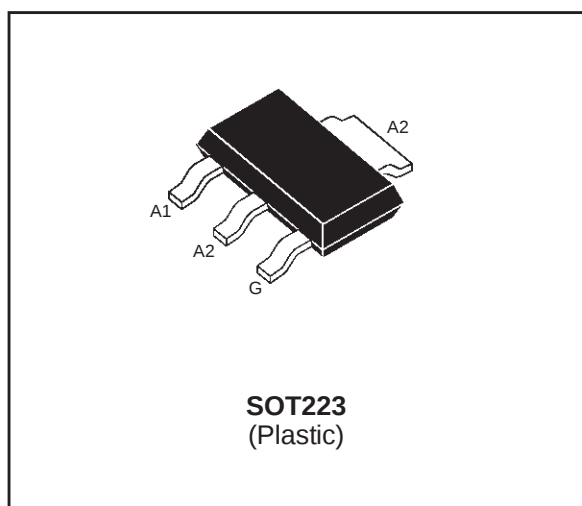
## SENSITIVE GATE TRIACS

### FEATURES

- $I_{T(RMS)} = 1A$
- $V_{DRM} = 400V$  to  $800V$
- $I_{GT} \leq 3mA$  to  $\leq 25mA$

### DESCRIPTION

The Z01xxxN series of triacs uses a high performance TOP GLASS PNP technology. These parts are intended for general purpose high volume applications using surface mount technology.



### ABSOLUTE RATINGS (limiting values)

| Symbol             | Parameter                                                                                          |                                  | Value                      | Unit        |
|--------------------|----------------------------------------------------------------------------------------------------|----------------------------------|----------------------------|-------------|
| $I_{T(RMS)}$       | RMS on-state current<br>(360° conduction angle)                                                    | $T_{tab} = 90\text{ °C}$         | 1                          | A           |
| $I_{TSM}$          | Non repetitive surge peak on-state current<br>( $T_j$ initial = $25\text{ °C}$ )                   | $t_p = 8.3\text{ ms}$            | 8.5                        | A           |
|                    |                                                                                                    | $t_p = 10\text{ ms}$             | 8                          |             |
| $I^2t$             | $I^2t$ Value for fusing                                                                            | $t_p = 10\text{ ms}$             | 0.35                       | $A^2s$      |
| $di/dt$            | Critical rate of rise of on-state current<br>$I_G = 50\text{ mA}$ $di_G/dt = 0.1\text{ A}/\mu s$ . | Repetitive<br>$F = 50\text{ Hz}$ | 10                         | $A/\mu s$   |
|                    |                                                                                                    | Non Repetitive                   | 50                         |             |
| $T_{stg}$<br>$T_j$ | Storage and operating junction temperature range                                                   |                                  | - 40, + 150<br>- 40, + 125 | $^{\circ}C$ |
| $TI$               | Maximum lead temperature for soldering during 10s                                                  |                                  | 260                        | $^{\circ}C$ |

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

**Z01xxxN****THERMAL RESISTANCES**

| Symbol   | Parameter                                               | Value | Unit |
|----------|---------------------------------------------------------|-------|------|
| Rth(j-a) | Junction to ambient                                     | 60    | °C/W |
| Rth(j-t) | Junction to leads for D.C                               | 30    | °C/W |
| Rth(j-t) | Junction to leads for A.C 360°conduction angle (F=50Hz) | 25    | °C/W |

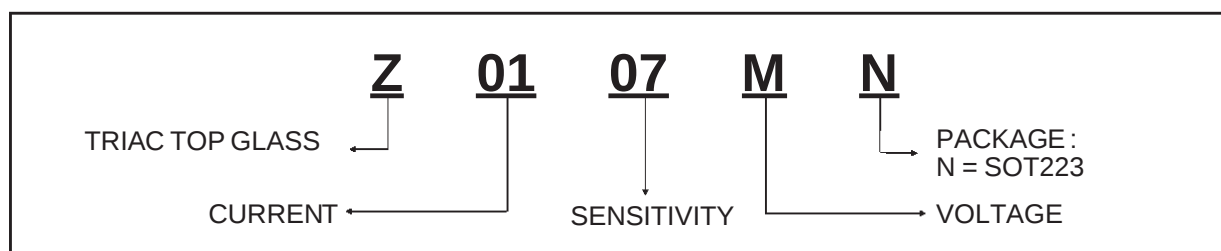
**GATE CHARACTERISTICS** (maximum values)

$P_G (AV) = 0.1 \text{ W}$   $P_{GM} = 2 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )  $I_{GM} = 1 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )

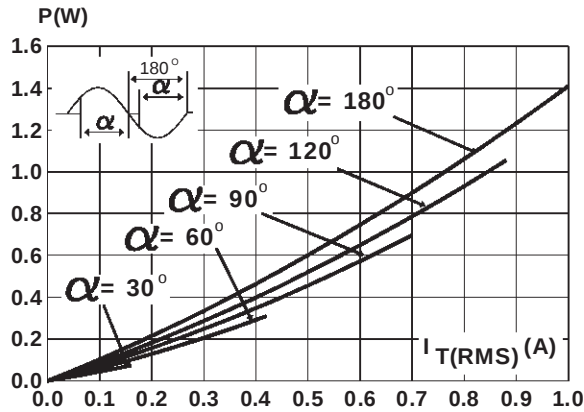
**ELECTRICAL CHARACTERISTICS**

| Symbol                               | Test Conditions                                                                                                  |                        | Quadrant    |     | Sensitivity |    |    |     | Unit |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------|-------------|-----|-------------|----|----|-----|------|
|                                      |                                                                                                                  |                        |             |     | 03          | 07 | 09 | 10  |      |
| I <sub>GT</sub>                      | V <sub>D</sub> =12V (DC) R <sub>L</sub> =140Ω                                                                    | T <sub>j</sub> = 25°C  | I-II-III    | MAX | 3           | 5  | 10 | 25  | mA   |
|                                      |                                                                                                                  |                        | IV          | MAX | 5           | 7  | 10 | 25  |      |
| V <sub>GT</sub>                      | V <sub>D</sub> =12V (DC) R <sub>L</sub> =140Ω                                                                    | T <sub>j</sub> = 25°C  | I-II-III-IV | MAX | 1.5         |    |    |     | V    |
| V <sub>GD</sub>                      | V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ                                                           | T <sub>j</sub> = 125°C | I-II-III-IV | MIN | 0.2         |    |    |     | V    |
| tgt                                  | V <sub>D</sub> =V <sub>DRM</sub> I <sub>G</sub> = 40mA<br>I <sub>T</sub> = 1.4A<br>dI <sub>G</sub> /dt = 0.5A/μs | T <sub>j</sub> = 25°C  | I-II-III-IV | TYP | 2           |    |    |     | μs   |
| I <sub>H</sub> *                     | I <sub>T</sub> = 50 mA Gate open                                                                                 | T <sub>j</sub> = 25°C  |             | MAX | 7           | 10 | 10 | 25  | mA   |
| I <sub>L</sub>                       | I <sub>G</sub> = 1.2 I <sub>GT</sub>                                                                             | T <sub>j</sub> = 25°C  | I-III-IV    | TYP | 7           | 10 | 10 | 25  | mA   |
|                                      |                                                                                                                  |                        | II          | TYP | 14          | 20 | 20 | 50  |      |
| V <sub>TM</sub> *                    | I <sub>TM</sub> = 1.4A tp=380μs                                                                                  | T <sub>j</sub> = 25°C  |             | MAX | 1.8         |    |    |     | V    |
| I <sub>DRM</sub><br>I <sub>RRM</sub> | V <sub>D</sub> = V <sub>DRM</sub><br>V <sub>R</sub> = V <sub>RRM</sub>                                           | T <sub>j</sub> = 25°C  |             | MAX | 10          |    |    |     | μA   |
|                                      |                                                                                                                  | T <sub>j</sub> = 110°C |             | MAX | 200         |    |    |     |      |
| dV/dt *                              | VD=67%V <sub>DRM</sub> Gate open                                                                                 | T <sub>j</sub> = 110°C |             | MIN | 10          | 20 | 50 | 100 | V/μs |
| (dV/dt)c *                           | (dI/dt)c = 0.44 A/ms                                                                                             | T <sub>j</sub> = 110°C |             | MIN |             |    | 2  | 5   | V/μs |
|                                      |                                                                                                                  |                        |             | TYP | 1           | 1  |    |     |      |

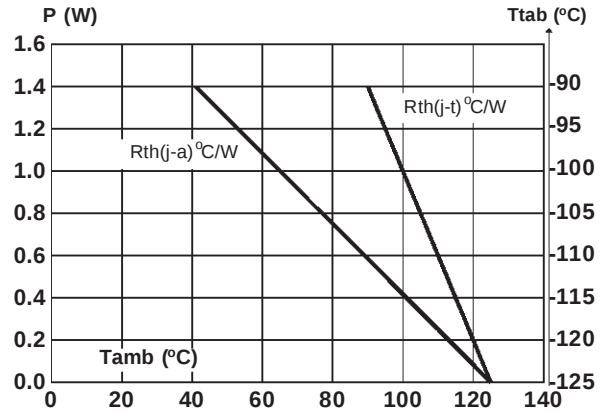
\* For either polarity of electrode A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>

**ORDERING INFORMATION**

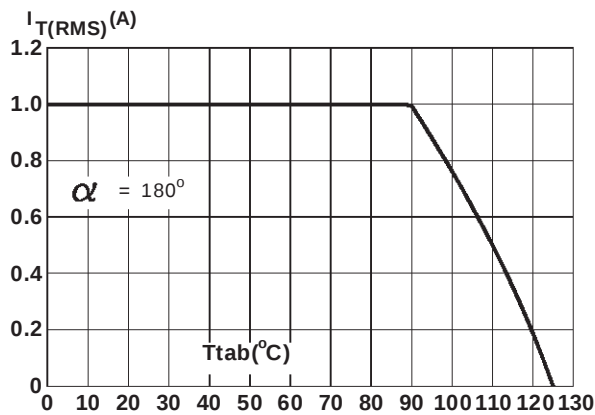
**Fig.1 :** Maximum power dissipation versus RMS on-state current.



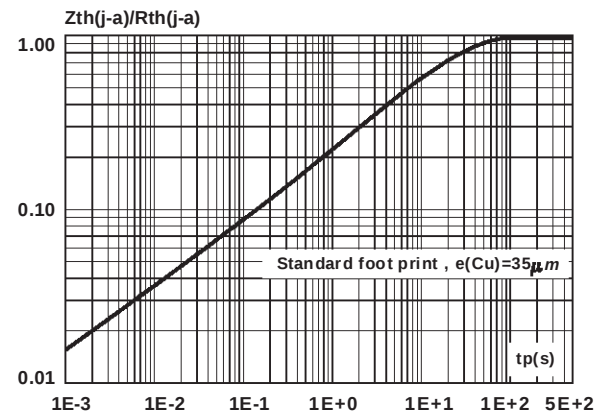
**Fig.2 :** Correlation between maximum power dissipation and maximum allowable temperature ( $T_{amb}$  and  $T_{tab}$ ).



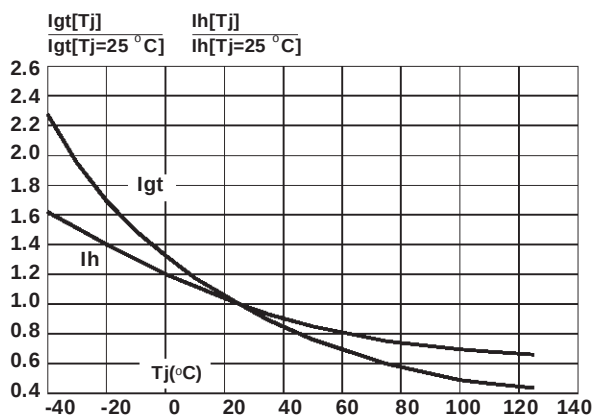
**Fig.3 :** RMS on-state current versus tab temperature.



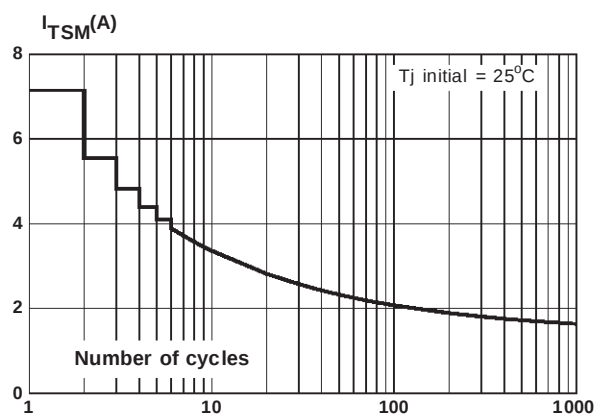
**Fig.4 :** Relative variation of thermal impedance junction to ambient versus pulse duration.



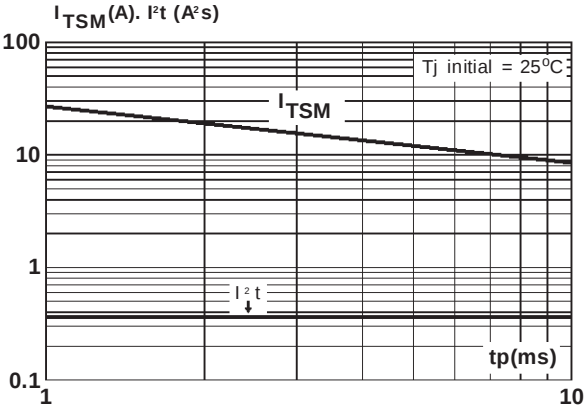
**Fig.5 :** Relative variation of gate trigger current and holding current versus junction temperature.



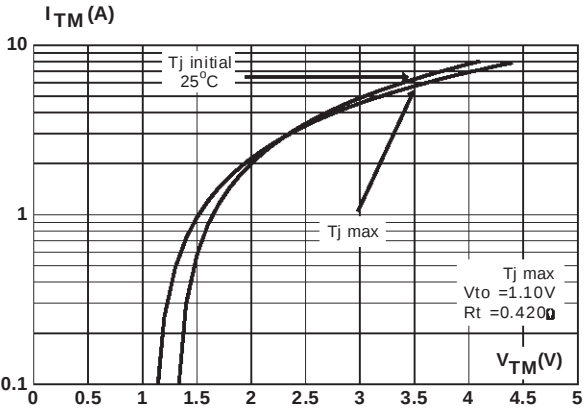
**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

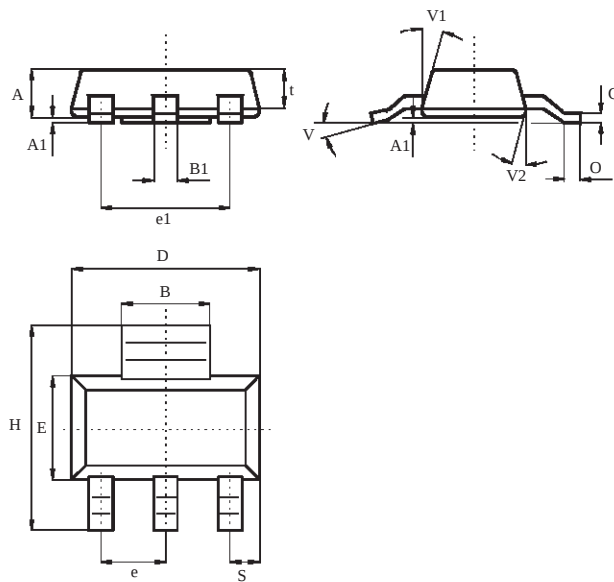


**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



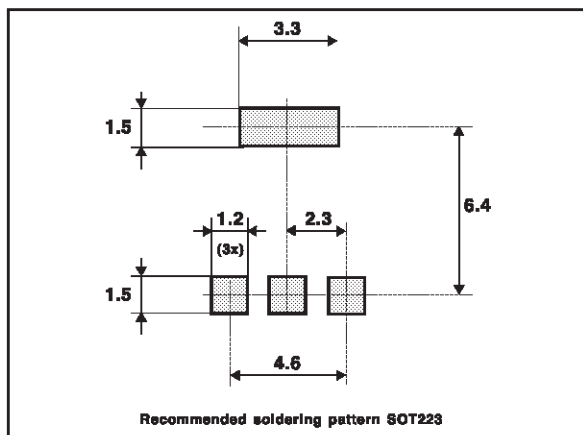
**Fig.8 :** On-state characteristics (maximum values).



**PACKAGE MECHANICAL DATA**  
 SOT223 (Plastic)


| REF. | DIMENSIONS     |      |      |        |       |       |
|------|----------------|------|------|--------|-------|-------|
|      | Millimeters    |      |      | Inches |       |       |
|      | Min.           | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 1.50           |      | 1.70 | 0.059  |       | 0.067 |
| A1   | 0.02           |      | 0.10 | 0.001  |       | 0.004 |
| B    | 2.95           |      | 3.15 | 0.090  |       | 0.124 |
| B1   | 0.65           |      | 0.85 | 0.026  |       | 0.033 |
| C    | 0.25           |      | 0.35 | 0.010  |       | 0.014 |
| D    | 6.30           |      | 6.70 | 0.248  |       | 0.264 |
| e    |                | 2.3  |      |        | 0.091 |       |
| e1   |                | 4.6  |      |        | 0.181 |       |
| E    | 3.30           |      | 3.70 | 0.130  |       | 0.146 |
| H    | 6.70           |      | 7.30 | 0.264  |       | 0.287 |
| O    | 0.63           | 0.65 | 0.67 | 0.025  | 0.026 | 0.026 |
| S    | 0.85           |      | 1.05 | 0.033  |       | 0.041 |
| t    | 1.10           |      | 1.30 | 0.043  |       | 0.051 |
| V    | 10° max        |      |      |        |       |       |
| V1   | 10° min 16°max |      |      |        |       |       |
| V2   | 10° min 16°max |      |      |        |       |       |

Weight : 0.11 g

**FOOT PRINT**

## Z01xxxN

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### MARKING

| Type    | Marking |
|---------|---------|
| Z0103DN | Z3D     |
| Z0103MN | Z3M     |
| Z0103SN | Z3S     |
| Z0103NN | Z3N     |
| Z0107DN | Z7D     |
| Z0107MN | Z7M     |
| Z0107SN | Z7S     |
| Z0107NN | Z7N     |
| Z0109DN | Z9D     |
| Z0109MN | Z9M     |
| Z0109SN | Z9S     |
| Z0109NN | Z9N     |
| Z0110DN | Z0D     |
| Z0110MN | Z0M     |
| Z0110SN | Z0S     |
| Z0110NN | Z0N     |

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