

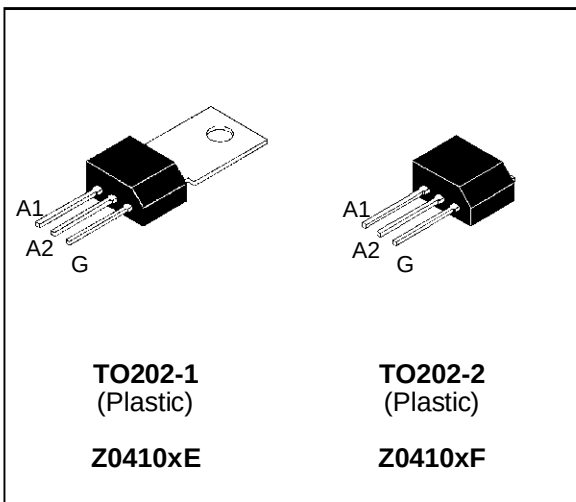
## STANDARD TRIACS

### FEATURES

- $I_{T(RMS)} = 4A$
- $V_{DRM} = 400V$  to  $800V$
- $I_{GT} \leq 25mA$

### DESCRIPTION

The Z0410xE/F series of triacs uses a high performance TOP GLASS PNPN technology. These parts are intended for general purpose switching and phase control applications.



### ABSOLUTE RATINGS (limiting values)

| Symbol             | Parameter                                                                               |                              | Value                      | Unit       |
|--------------------|-----------------------------------------------------------------------------------------|------------------------------|----------------------------|------------|
| $I_{T(RMS)}$       | RMS on-state current<br>(360° conduction angle)                                         | Z0410xE/F $T_c = 75^\circ C$ | 4                          | A          |
|                    |                                                                                         | Z0410xF $T_a = 25^\circ C$   | 0.95                       |            |
| $I_{TSM}$          | Non repetitive surge peak on-state current<br>( $T_j$ initial = $25^\circ C$ )          | $t_p = 8.3$ ms               | 22                         | A          |
|                    |                                                                                         | $t_p = 10$ ms                | 20                         |            |
| $I^2t$             | $I^2t$ Value for fusing                                                                 | $t_p = 10$ ms                | 2                          | $A^2s$     |
| $di/dt$            | Critical rate of rise of on-state current<br>$I_G = 50$ mA $di_G/dt = 0.1$ A/ $\mu s$ . | Repetitive<br>$F = 50$ 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 at 4.5mm from case                    |                              | 260                        | $^\circ C$ |

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

## Z0410xE/F

### THERMAL RESISTANCES

| Symbol   | Parameter                                               |         | Value | Unit |
|----------|---------------------------------------------------------|---------|-------|------|
| Rth(j-a) | Junction to ambient                                     | Z0410xE | 80    | °C/W |
|          |                                                         | Z0410xF | 100   |      |
| Rth(j-c) | Junction to case for D.C                                |         | 10    | °C/W |
| Rth(j-c) | Junction to case for A.C 360° conduction angle (F=50Hz) |         | 7.5   | °C/W |

### GATE CHARACTERISTICS (maximum values)

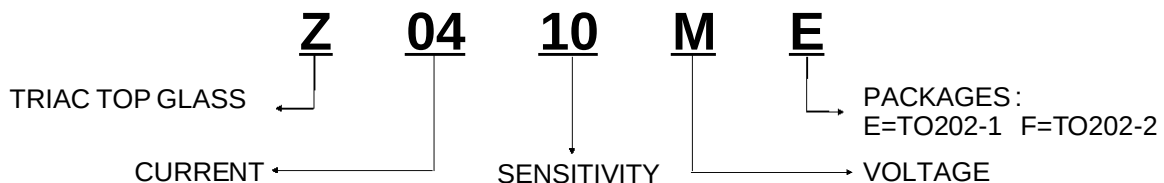
$P_{G(AV)} = 0.2 \text{ W}$   $P_{GM} = 3 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )  $I_{GM} = 1.2 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )

### ELECTRICAL CHARACTERISTICS

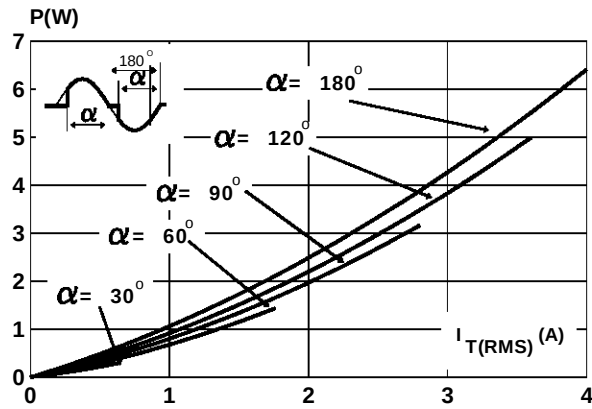
| Symbol                 | Test Conditions                                                                                   |                           | Quadrant    |     | Sensitivity | Unit             |
|------------------------|---------------------------------------------------------------------------------------------------|---------------------------|-------------|-----|-------------|------------------|
|                        |                                                                                                   |                           |             |     | 10          |                  |
| $I_{GT}$               | $V_D = 12\text{V}$ (DC) $R_L = 33\Omega$                                                          | $T_j = 25^\circ\text{C}$  | I-II-III-IV | MAX | 25          | 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>$I_T = 5.5\text{A}$<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 | 25          | mA               |
| $I_L$                  | $I_G = 1.2 I_{GT}$                                                                                | $T_j = 25^\circ\text{C}$  | I-III-IV    | TYP | 25          | mA               |
|                        |                                                                                                   |                           | II          | TYP | 50          |                  |
| $V_{TM}^*$             | $I_{TM} = 5.5\text{A}$ $t_p = 380\mu\text{s}$                                                     | $T_j = 25^\circ\text{C}$  |             | MAX | 2           | V                |
| $I_{DRM}$<br>$I_{RRM}$ | $V_D = V_{DRM}$<br>$V_R = V_{RRM}$                                                                | $T_j = 25^\circ\text{C}$  |             | MAX | 5           | $\mu\text{A}$    |
|                        |                                                                                                   | $T_j = 110^\circ\text{C}$ |             | MAX | 200         |                  |
| dV/dt *                | $V_D = 67\% V_{DRM}$<br>Gate open                                                                 | $T_j = 110^\circ\text{C}$ |             | MIN | 200         | V/ $\mu\text{s}$ |
|                        |                                                                                                   |                           |             | TYP | 400         |                  |
| (dV/dt)c *             | (dI/dt)c = 1.8 A/ms                                                                               | $T_j = 110^\circ\text{C}$ |             | MIN | 5           | V/ $\mu\text{s}$ |

\* For either polarity of electrode  $A_2$  voltage with reference to electrode  $A_1$

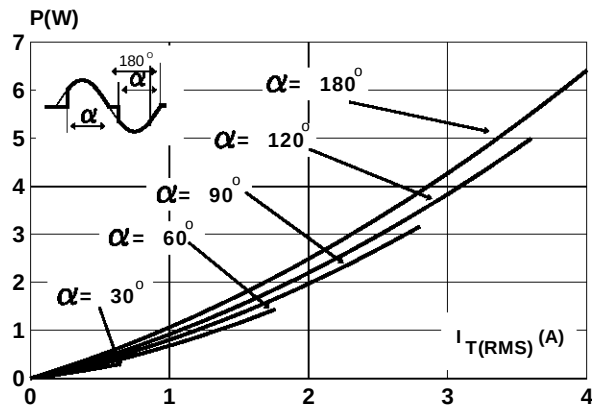
### ORDERING INFORMATION



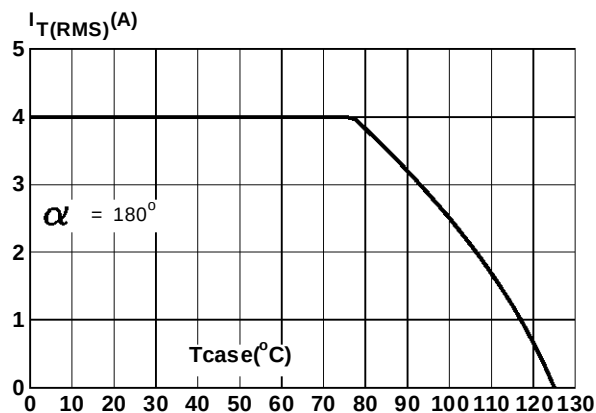
**Fig.1 :** Maximum RMS power dissipation versus RMS on-state current.



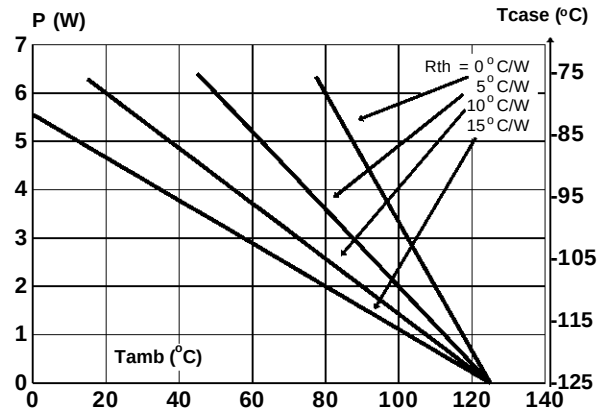
**Fig.3 :** Maximum RMS power dissipation versus RMS on-state current.



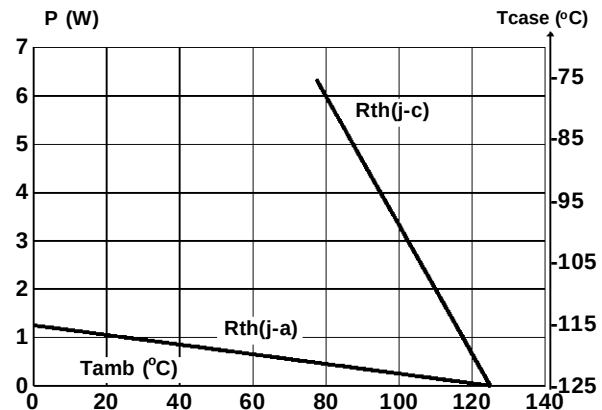
**Fig.5 :** RMS on-state current versus case temperature (TO202-1).



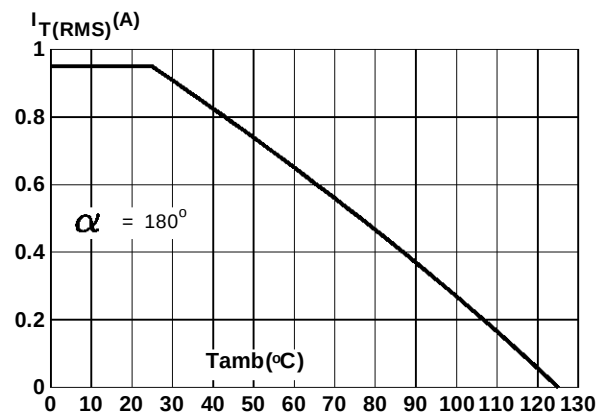
**Fig.2 :** Correlation between maximum RMS power dissipation and maximum allowable temperature ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (TO202-1).



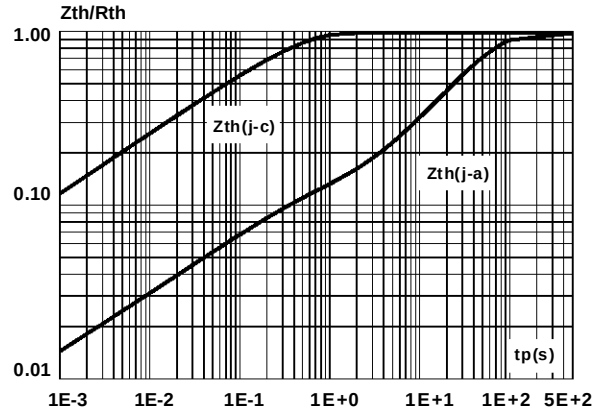
**Fig.4 :** Correlation between maximum RMS power dissipation and maximum allowable temperature ( $T_{amb}$  and  $T_{case}$ ) (TO202-2).



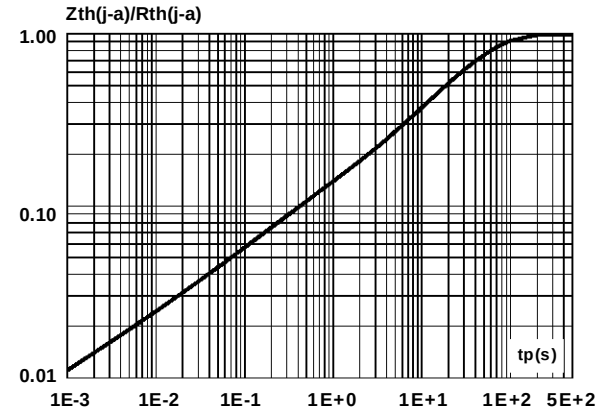
**Fig.6 :** RMS on-state current versus case temperature (TO202-2).



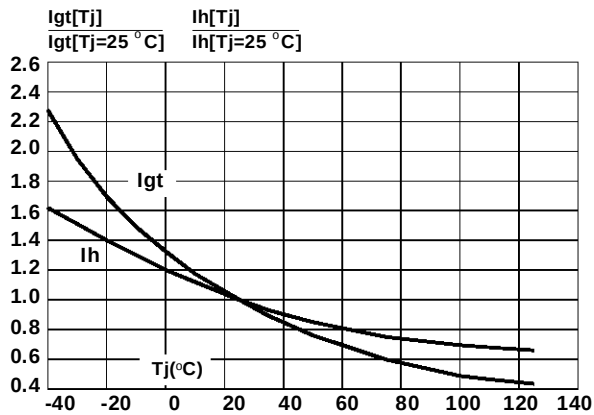
**Fig.6** : Relative variation of thermal impedance versus pulse duration (TO202-1).



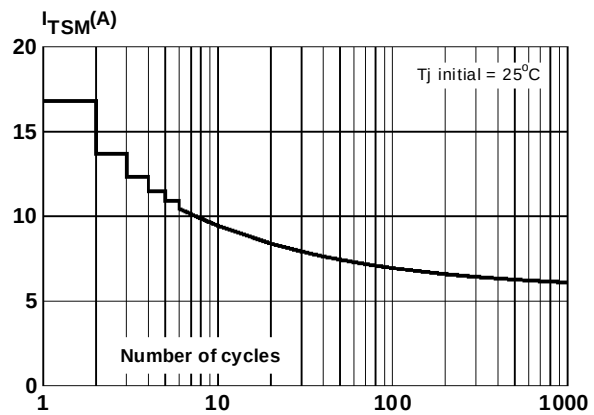
**Fig.7** : Relative variation of thermal impedance junction to ambient versus pulse duration (TO202-2).



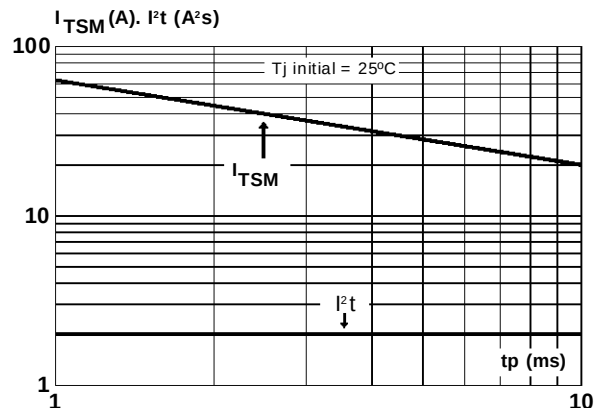
**Fig.9** : Relative variation of gate trigger current and holding current versus junction temperature.



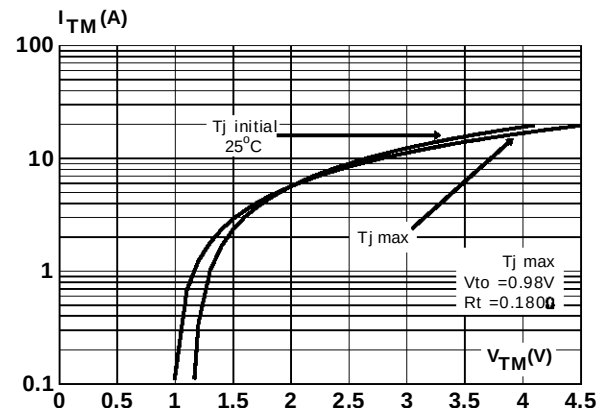
**Fig.10** : Non repetitive surge peak on-state current versus number of cycles.



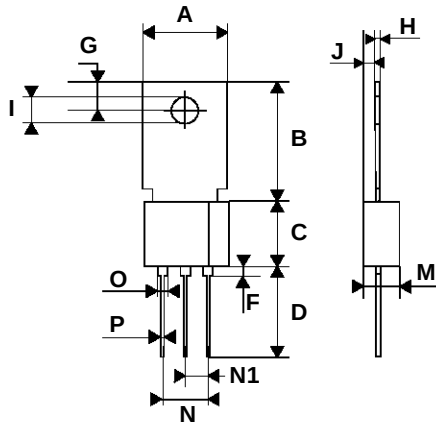
**Fig.11** : Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



**Fig.12** : On-state characteristics (maximum values).



**PACKAGE MECHANICAL DATA**  
TO202-1 (Plastic)

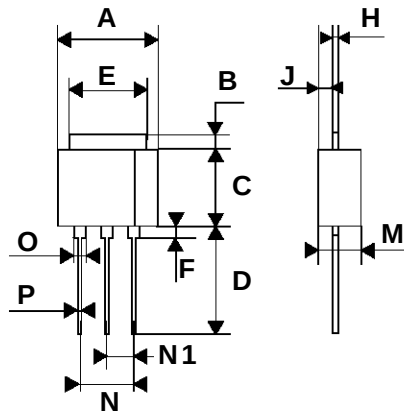


| REF. | DIMENSIONS  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Typ.        | Min. | Max. | Typ.   | Min.  | Max.  |
| A    |             |      | 10.1 |        |       | 0.398 |
| B    | 13.7        |      |      | 0.540  |       |       |
| C    | 7.3         |      |      | 0.287  |       |       |
| D    | 10.5        |      |      | 0.413  |       |       |
| F    |             |      | 1.5  |        |       | 0.059 |
| G    | 3.2         |      |      | 0.126  |       |       |
| H    | 0.51        |      |      | 0.020  |       |       |
| I    |             | 3.16 | 3.20 |        | 0.124 | 0.126 |
| J    | 1.5         |      |      | 0.059  |       |       |
| M    | 4.5         |      |      | 0.177  |       |       |
| N    |             |      | 5.3  |        |       | 0.209 |
| N1   | 2.54        |      |      | 0.100  |       |       |
| O    |             |      | 1.4  |        |       | 0.055 |
| P    |             |      | 0.7  |        |       | 0.028 |

Marking : type number  
Weight : 1.4 g

## Z0410xE/F

### PACKAGE MECHANICAL DATA TO202-2 (Plastic)



| REF. | DIMENSIONS  |      |      |        |      |       |
|------|-------------|------|------|--------|------|-------|
|      | Millimeters |      |      | Inches |      |       |
|      | Typ.        | Min. | Max. | Typ.   | Min. | Max.  |
| A    |             |      | 10.1 |        |      | 0.398 |
| B    | 1.2         |      |      | 0.047  |      |       |
| C    | 7.3         |      |      | 0.287  |      |       |
| D    | 10.5        |      |      | 0.413  |      |       |
| E    | 7.4         |      |      | 0.290  |      |       |
| F    |             |      | 1.5  |        |      | 0.059 |
| H    | 0.51        |      |      | 0.020  |      |       |
| J    | 1.5         |      |      | 0.059  |      |       |
| M    | 4.5         |      |      | 0.177  |      |       |
| N    |             |      | 5.3  |        |      | 0.209 |
| N1   | 2.54        |      |      | 0.100  |      |       |
| O    |             |      | 1.4  |        |      | 0.055 |
| P    |             |      | 0.7  |        |      | 0.028 |

Marking : type number  
Weight : 1.0 g

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