

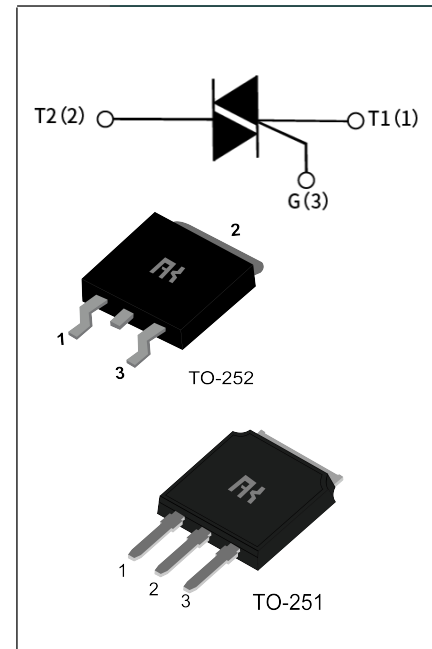
## T4xx series TRIACS

### GENERAL DESCRIPTION:

High current density due to single mesa technology; Glass Passivation. T4xx series triacs are suitable for general purpose AC switching. They can be used as an ON/OFF Function in applications such as static relays, heating regulation motor starting circuits...or for phase control operation light dimmers, motor speed controllers. T4xx series are 3 Quadrants triacs. They are specially recommended for use on inductive loads.

### Main Features:

| $I_{T(RMS)}$ | $V_{DRM}/V_{RRM}$ | $V_{TM}$     |
|--------------|-------------------|--------------|
| 4 A          | 600V and 800 V    | $\leq 1.5$ V |



### Absolute Ratings(limiting values) :

| Symbol       | Parameter   | Value           | Unit        |
|--------------|---|-----------------|-------------|
| $T_{stg}$    | Storage junction temperature range                              | - 40 to + 125   | $^{\circ}C$ |
| $T_j$        | Operating junction temperature range                            | - 40 to +125    | $^{\circ}C$ |
| $I_{T(RMS)}$ | RMS on-state current TO-251/252 ( $T_C=86^{\circ}C$ )           | 4               | A           |
| $I_{TSM}$    | Non repetitive surge peak on-state current (full cycle, F=50Hz) | 40              | A           |
| $V_{DRM}$    | Repetitive peak off-state voltage( $T_j =25^{\circ}C$ )         | 600 and 800     | V           |
| $V_{RRM}$    | Repetitive peak reverse voltage( $T_j =25^{\circ}C$ )           | 600 and 800     | V           |
| $V_{DSM}$    | Non repetitive surge peak Off-state voltage                     | $V_{DRM} + 100$ | V           |
| $V_{RSM}$    | Non repetitive peak reverse voltage                             | $V_{RRM} + 100$ | V           |
| $I^2t$       | $I^2t$ value for fusing $t_p = 10$ ms                           | 8               | $A^2s$      |

|                          |   |    |            |
|--------------------------|---|----|------------|
| <b>dI/dt</b>             | Critical rate of rise of on-state current ( $I_G = 2 \times I_{GT}$ ) | 50 | A/ $\mu$ s |
| <b>I<sub>GM</sub></b>    | Peak gate current   | 4  | A          |
| <b>P<sub>G(AV)</sub></b> | Average gate power dissipation  | 1  | W          |
| <b>P<sub>GM</sub></b>    | Peak gate power   | 5  | W          |

**Electrical Characteristics : (T<sub>j</sub>=25°C unless otherwise specified)**

| Symbol                     | Test Condition  | Quadrant | Range | Value |      |      |      | Unit       |
|----------------------------|---|----------|-------|-------|------|------|------|------------|
|                            |   |          |       | T405  | T410 | T425 | T450 |            |
| <b>I<sub>GT</sub></b>      | V <sub>D</sub> =12V R <sub>L</sub> =33 $\Omega$   | I-II-III | MAX   | 5     | 10   | 25   | 50   | mA         |
| <b>V<sub>GT</sub></b>      |   | I-II-III | MAX   | 1.5   |      |      |      | V          |
| <b>V<sub>GD</sub></b>      | V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3k $\Omega$<br>T <sub>j</sub> =150°C | I-II-III | MIN   | 0.2   |      |      |      | V          |
| <b>I<sub>L</sub></b>       | I <sub>G</sub> =1.2 I <sub>GT</sub>   | I-III    | MAX   | 10    | 20   | 50   | 70   | mA         |
|                            |   | II       |       | 15    | 25   | 60   | 80   |            |
| <b>I<sub>H</sub></b>       | I <sub>TM</sub> = 100mA   |          | MAX   | 10    | 15   | 35   | 60   | mA         |
| <b>dV/dt</b>               | V <sub>D</sub> =2/3V <sub>DRM</sub> R <sub>GK</sub> =1k $\Omega$ T <sub>j</sub> =150°C  |          | MIN   | 50    | 100  | 400  | 1000 | V/ $\mu$ s |
| <b>(dV/dt)<sub>c</sub></b> | (dI/dt) <sub>c</sub> =-2.6A/ms T <sub>j</sub> =150°C                                    |          | MIN   | 1     | 5    | 15   | 25   | V/ $\mu$ s |

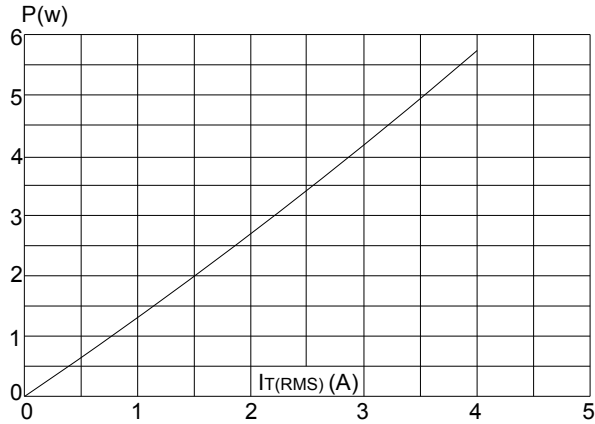
**Static Characteristics**

| Symbol   | Parameter   | Value(MAX)            | Unit |         |
|--|---|-----------------------|------|---------|
| <b>V<sub>TM</sub></b>                            | I <sub>TM</sub> =5.5A t <sub>p</sub> = 380 $\mu$ s                  | T <sub>j</sub> =25°C  | 1.5  | V       |
| <b>I<sub>DRM</sub></b><br><b>I<sub>RRM</sub></b> | V <sub>D</sub> =V <sub>DRM</sub> , V <sub>R</sub> =V <sub>RRM</sub> | T <sub>j</sub> =25°C  | 10   | $\mu$ A |
|  |   | T <sub>j</sub> =125°C | 0.75 | mA      |

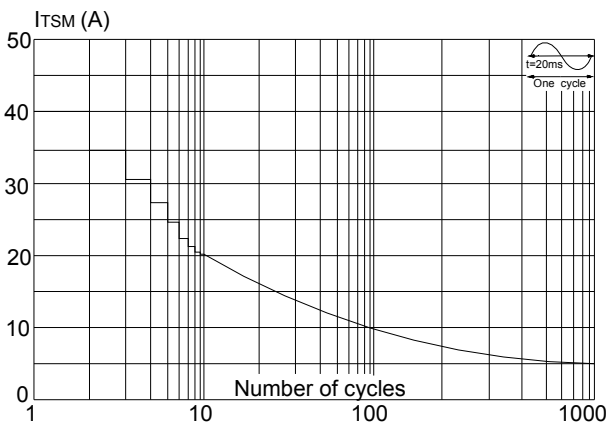
**Thermal Resistances :**

| Symbol                     | Parameter               | Value      | Unit |      |
|----------------------------|-------------------------|------------|------|------|
| <b>R<sub>th(j-c)</sub></b> | Junction to case for AC | TO-251/252 | 1.5  | °C/W |

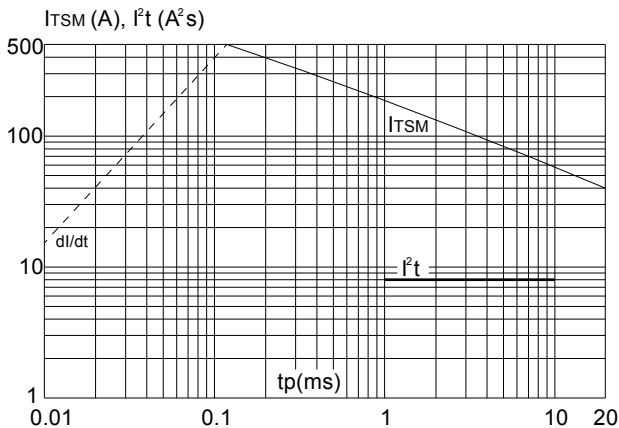
**FIG.1:** Maximum power dissipation versus RMS on-state current



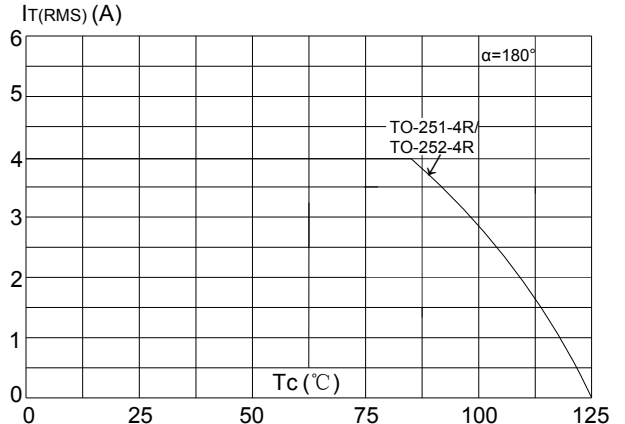
**FIG.3:** Surge peak on-state current versus number of cycles



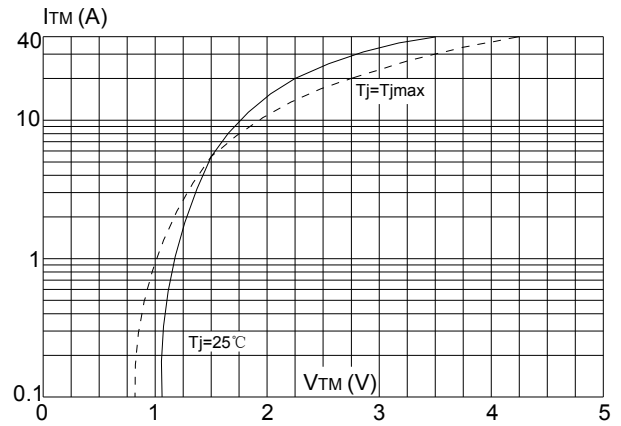
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$  and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )



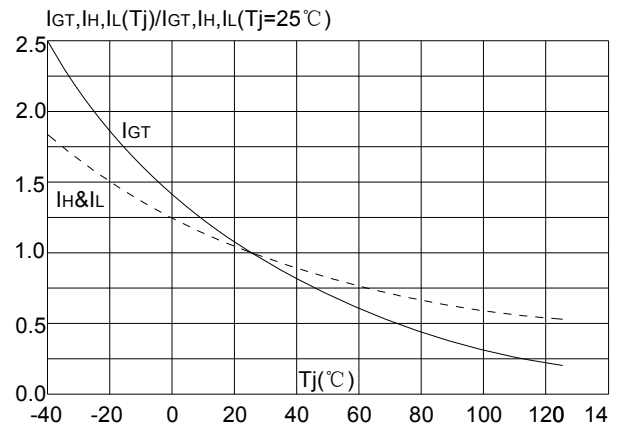
**FIG.2:** RMS on-state current versus case temperature



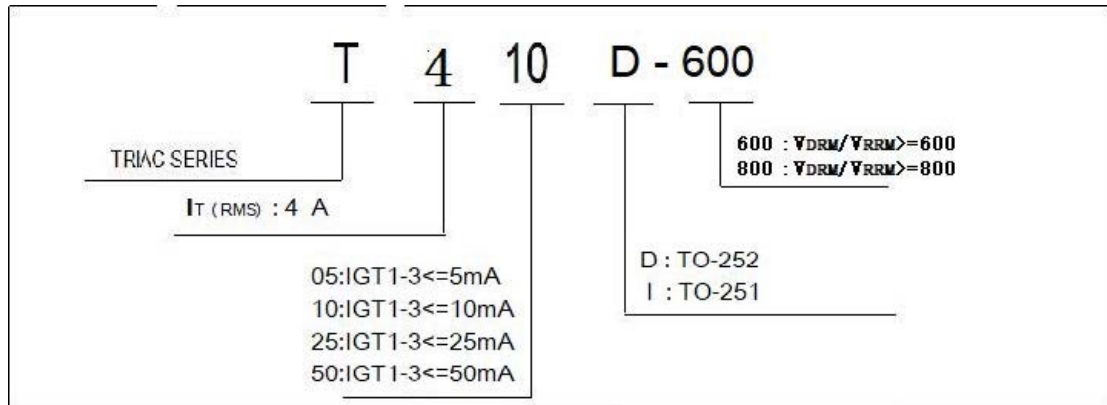
**FIG.4:** On-state characteristics (maximum values)



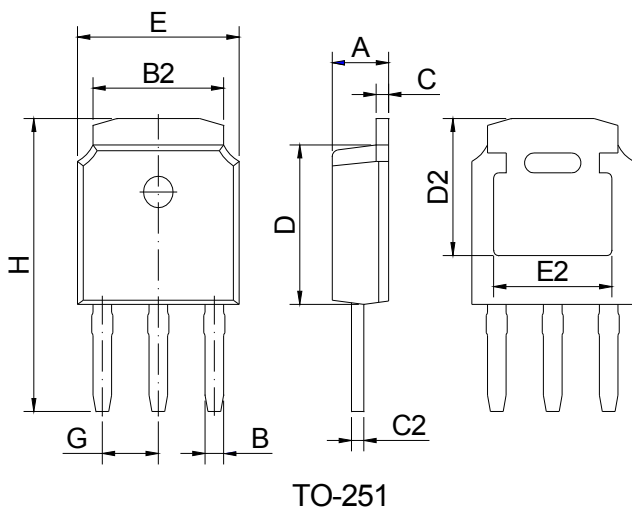
**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



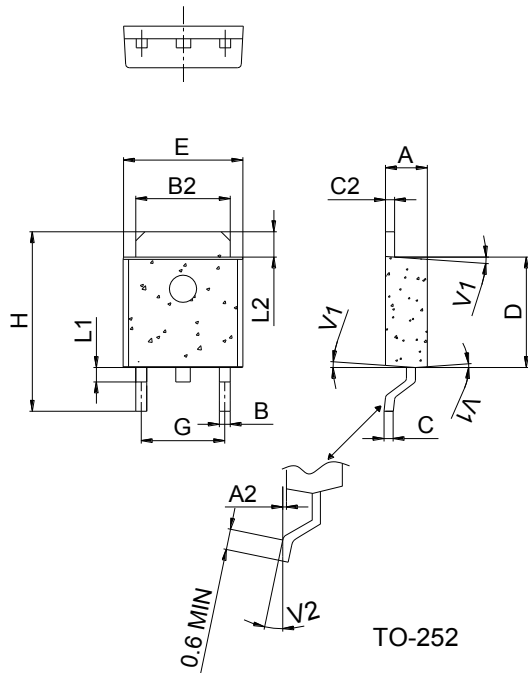
**Ordering Information:**



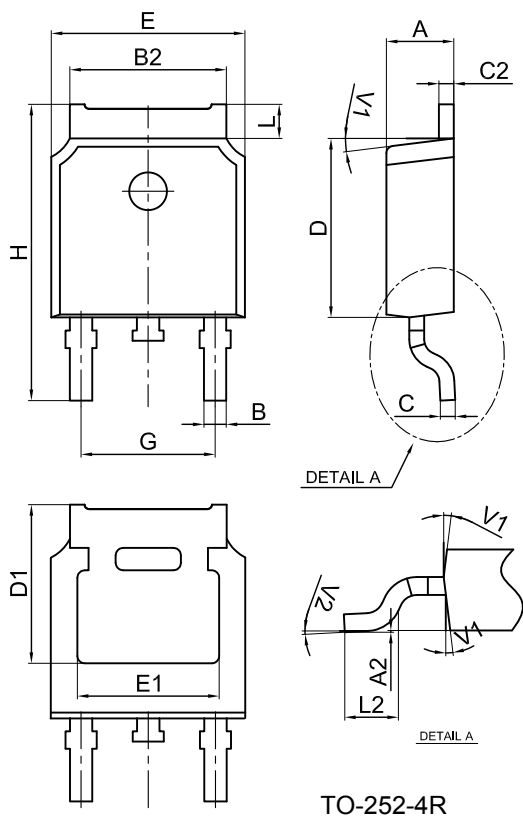
**Package Mechanical Data :**



| Ref. | Dimensions  |       |       |           |       |       |
|------|-------------|-------|-------|-----------|-------|-------|
|      | Millimeters |       |       | Inches    |       |       |
|      | Min.        | Typ.  | Max.  | Min.      | Typ.  | Max.  |
| A    | 2.10        | 2.30  | 2.50  | 0.083     | 0.091 | 0.098 |
| B    | 0.66        | 0.76  | 0.86  | 0.026     | 0.030 | 0.034 |
| B2   | 5.15        | 5.33  | 5.48  | 0.203     | 0.210 | 0.216 |
| C    | 0.44        | 0.51  | 0.58  | 0.017     | 0.020 | 0.023 |
| C2   | 0.44        | 0.51  | 0.58  | 0.017     | 0.020 | 0.023 |
| D    | 5.90        | 6.10  | 6.30  | 0.232     | 0.240 | 0.248 |
| D2   | 5.30 REF    |       |       | 0.209 REF |       |       |
| E    | 6.40        | 6.60  | 6.80  | 0.252     | 0.260 | 0.268 |
| E2   | 4.83 REF    |       |       | 0.190 REF |       |       |
| G    | 2.19        | 2.29  | 2.39  | 0.086     | 0.090 | 0.094 |
| H    | 10.60       | 11.20 | 11.80 | 0.417     | 0.441 | 0.465 |



| Ref. | Dimensions  |      |      |        |      |       |
|------|-------------|------|------|--------|------|-------|
|      | Millimeters |      |      | Inches |      |       |
|      | Min.        | Typ. | Max. | Min.   | Typ. | Max.  |
| A    | 2.20        |      | 2.40 | 0.086  |      | 0.095 |
| A2   | 0.03        |      | 0.23 | 0.001  |      | 0.009 |
| B    | 0.55        |      | 0.65 | 0.022  |      | 0.026 |
| B2   | 5.10        |      | 5.40 | 0.200  |      | 0.213 |
| C    | 0.45        |      | 0.62 | 0.018  |      | 0.024 |
| C2   | 0.48        |      | 0.62 | 0.019  |      | 0.024 |
| D    | 6.00        |      | 6.20 | 0.236  |      | 0.244 |
| E    | 6.40        |      | 6.70 | 0.252  |      | 0.264 |
| G    | 4.40        |      | 4.70 | 0.173  |      | 0.185 |
| H    | 9.35        |      | 10.6 | 0.368  |      | 0.417 |
| L1   | 1.30        |      | 1.70 | 0.051  |      | 0.067 |
| L2   | 1.37        |      | 1.50 | 0.054  |      | 0.059 |
| V1   |             | 4°   |      |        | 4°   |       |
| V2   | 0°          |      | 8°   | 0°     |      | 8°    |



| Ref. | Dimensions  |      |       |          |      |       |
|------|-------------|------|-------|----------|------|-------|
|      | Millimeters |      |       | Inches   |      |       |
|      | Min.        | Typ. | Max.  | Min.     | Typ. | Max.  |
| A    | 2.10        |      | 2.50  | 0.083    |      | 0.098 |
| A2   | 0           |      | 0.10  | 0        |      | 0.004 |
| B    | 0.66        |      | 0.86  | 0.026    |      | 0.034 |
| B2   | 5.18        |      | 5.48  | 0.202    |      | 0.216 |
| C    | 0.40        |      | 0.60  | 0.016    |      | 0.024 |
| C2   | 0.44        |      | 0.58  | 0.017    |      | 0.023 |
| D    | 5.90        |      | 6.30  | 0.232    |      | 0.248 |
| D1   | 5.30REF     |      |       | 0.209REF |      |       |
| E    | 6.40        |      | 6.80  | 0.252    |      | 0.268 |
| E1   | 4.63        |      |       | 0.182    |      |       |
| G    | 4.47        |      | 4.67  | 0.176    |      | 0.184 |
| H    | 9.50        |      | 10.70 | 0.374    |      | 0.421 |
| L    | 1.09        |      | 1.21  | 0.043    |      | 0.048 |
| L2   | 1.35        |      | 1.65  | 0.053    |      | 0.065 |
| V1   |             | 7°   |       |          | 7°   |       |
| V2   | 0°          |      | 6°    | 0°       |      | 6°    |