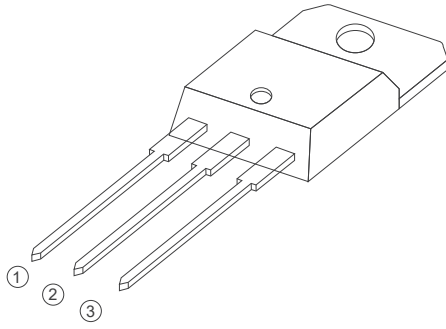
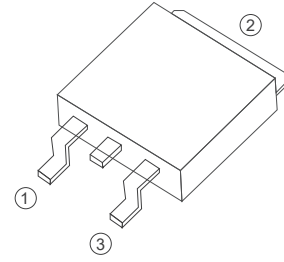


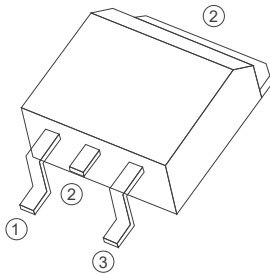
TYN612 Series  
12A SCRs  
Standard SCRs



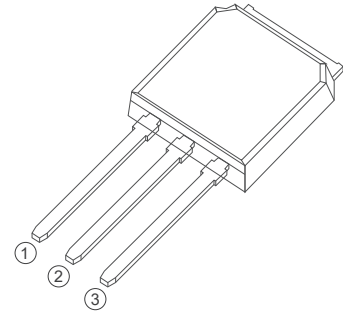
TO-220B Non-Insulated



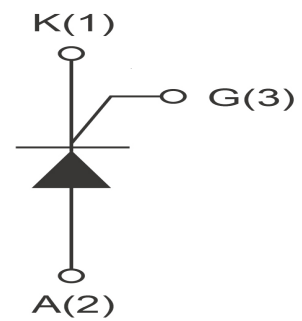
TO-252



TO-263



TO-251



## FEATURES

> IT(RMS):12A > VGT: 1.5V > VDRM VRRM:600Vand800V

## APPLICATIONS

Washing machine,vacuums, massager,solid state relay, AC Motor speed regulation and so on.

### Absolute Maximum Ratings (T<sub>J</sub>=25°C unless otherwise specified)

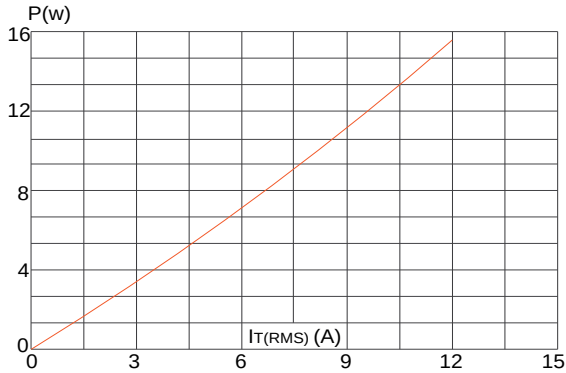
| Symbol               | Parameter                         | Conditions                                 | Ratings | Unit             |
|----------------------|-----------------------------------|--------------------------------------------|---------|------------------|
| VDRM<br>VRRM         | Repetitive Peak Off-State Voltage | TYN612 / TYN812                            | 600/800 | V                |
| I <sub>T</sub> (RMS) | R.M.S On-State Current            | T <sub>c</sub> =105°C                      | 12      | A                |
| I <sub>T</sub> (AV)  | On-state average current          | T <sub>C</sub> =105°C                      | 7.5     | A                |
| I <sub>TSM</sub>     | Surge On-State Current            | T <sub>p</sub> =10ms/t <sub>p</sub> =8.3ms | 120/132 | A                |
| I <sup>2</sup> t     | I <sup>2</sup> t for fusing       | T <sub>p</sub> =10ms                       | 75      | A <sup>2</sup> s |
| PGM                  | Peak Gate Power Dissipation       | T <sub>J</sub> =125°C                      | 2       | W                |
| PG(AV)               | Average Gate Power Dissipation    | T <sub>J</sub> =125°C                      | 0.5     | W                |
| T <sub>J</sub>       | Operating Junction Temperature    |                                            | ~40~125 | °C               |
| TSTG                 | Storage Temperature               |                                            | ~40~150 | °C               |

### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

| Symbol                | Parameter                                    | Test Conditions                                                                            | Value | Unit |
|-----------------------|----------------------------------------------|--------------------------------------------------------------------------------------------|-------|------|
| IDRM                  | Repetitive Peak Off-State Current            | T <sub>c</sub> =25°C                                                                       | ≤10   | uA   |
|                       |                                              | T <sub>c</sub> =125°C                                                                      | ≤1    | mA   |
| IRRM                  | Repetitive Peak Reverse Current              | T <sub>c</sub> =25°C                                                                       | ≤10   | uA   |
|                       |                                              | T <sub>c</sub> =125°C                                                                      | ≤1    | mA   |
| VTM                   | Forward "on" voltage                         | I <sub>T</sub> =23A t <sub>p</sub> =380us                                                  | ≤1.7  | V    |
| VGT                   | Gate trigger voltage                         | V <sub>D</sub> =12V ,I <sub>T</sub> =0.1A                                                  | ≤1.0  | V    |
| di/dt                 | Critical rate of rise of on-state current    | T <sub>J</sub> =125°C, I <sub>G</sub> =2xI <sub>GT</sub> , t <sub>r</sub> ≤100ns           | ≥50   | A/us |
| IGT                   | Gate trigger current                         | V <sub>D</sub> =12V I <sub>T</sub> =0.1A                                                   | ≤20   | mA   |
| IL                    | Latching current                             | I <sub>G</sub> =1.2I <sub>GT</sub>                                                         | ≤40   | mA   |
| IH                    | Holding current                              | I <sub>T</sub> =0.1A                                                                       | ≤30   | mA   |
| VGD                   | Gate non-trigger voltage                     | V <sub>D</sub> =VDRM<br>T <sub>J</sub> =125°C, R <sub>L</sub> =3.3KΩ, R <sub>GK</sub> =1KΩ | ≥0.25 | V    |
| dv/dt                 | Critical-rate of rise of commutation voltage | T <sub>J</sub> =125°C V <sub>D</sub> =2/3VDRM Gate open circuit                            | ≥200  | V/us |
| R <sub>th</sub> (j-c) | Thermal resistance                           | Junction to case                                                                           | 1     | °C/W |
| R <sub>th</sub> (j-a) | Thermal resistance                           | Junction to ambient                                                                        | 50    | °C/W |

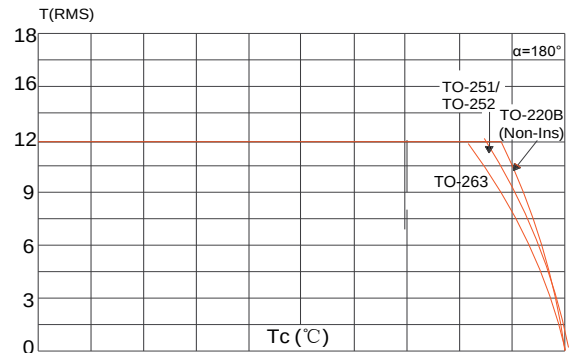
**FIG1**

Maximum power dissipation versus RMS on-state current



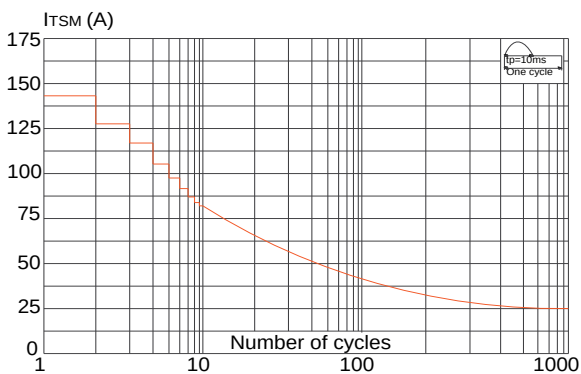
**FIG2**

RMS on-state current versus case temperature



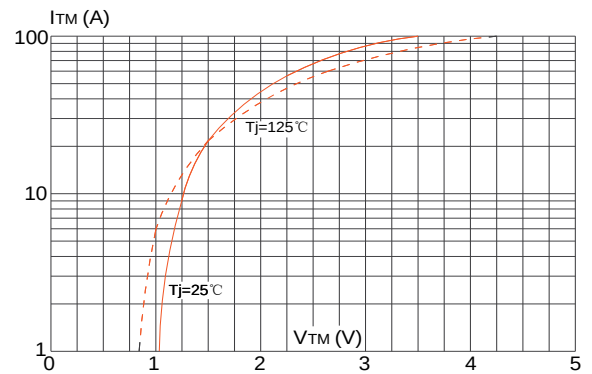
**FIG3**

Surge peak on-state current versus number of cycles



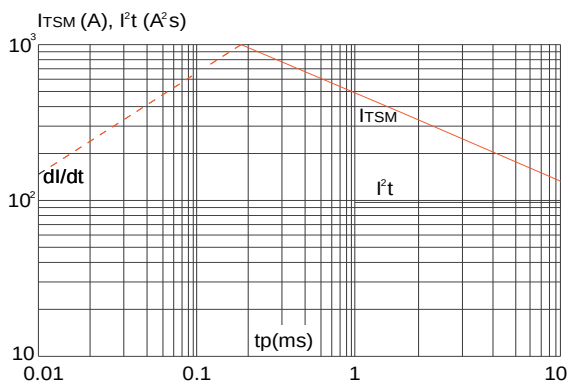
**FIG4**

On-state characteristics (maximum values)



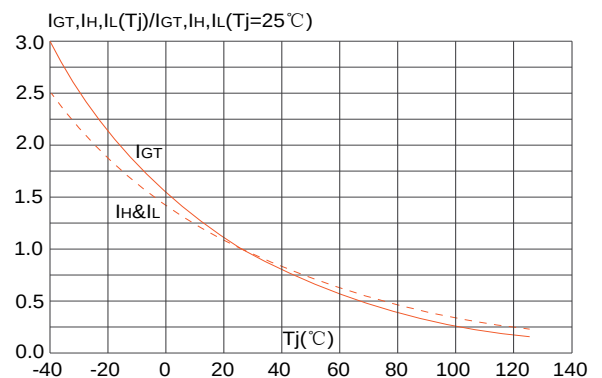
**FIG5**

Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20ms$ , and corresponding value of  $I^2t$  ( $dI/dt < 100A/\mu s$ )

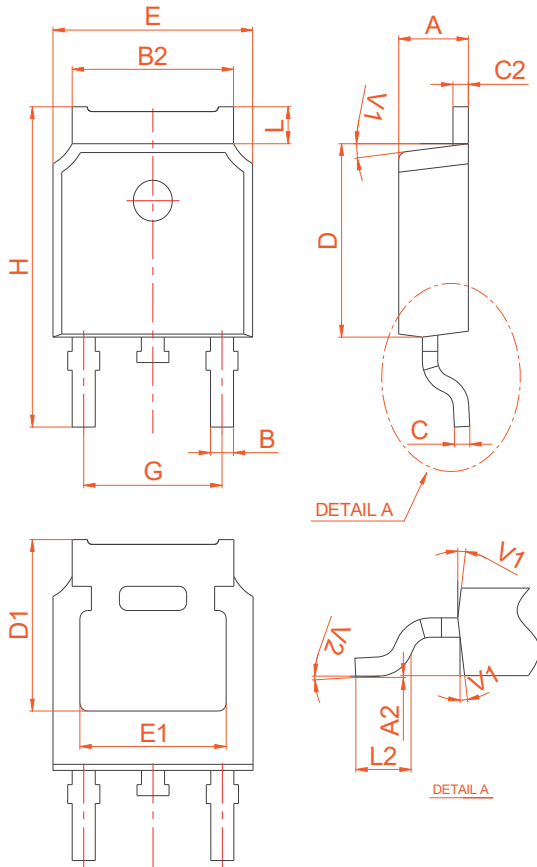


**FIG6**

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

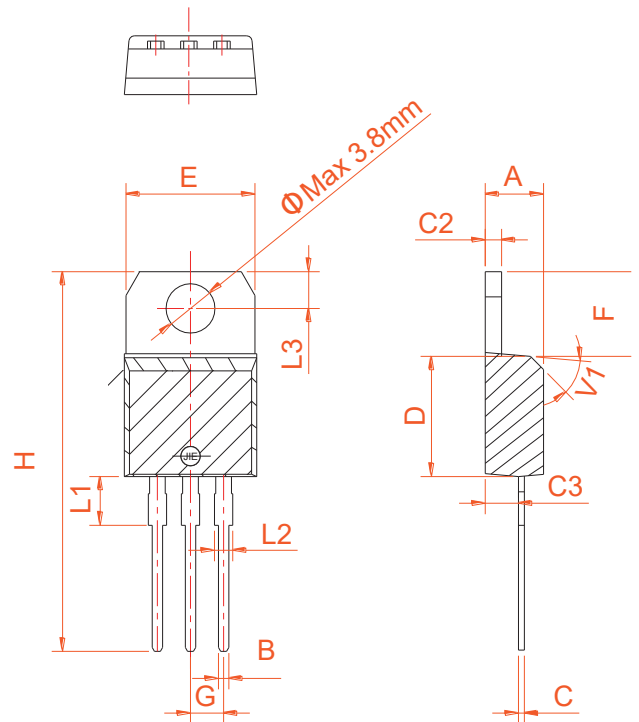


# PACKAGE MECHANICAL DATA

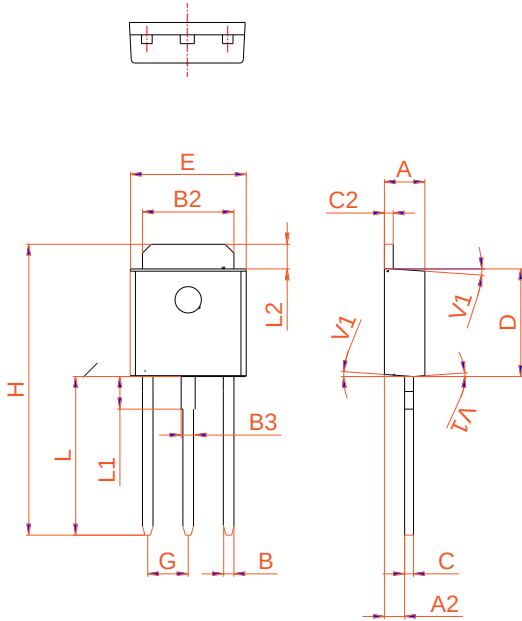


| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 2.20        |      | 2.40 | 0.086  |       | 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        |      | 0.55 | 0.018  |       | 0.022 |
| C2   | 2.70        |      | 2.90 | 0.106  |       | 0.114 |
| 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 |
| L3   |             | 0.8  |      |        | 0.031 |       |
| L4   |             | 0.8  |      |        | 0.031 |       |
| V1   |             | 4°   |      |        | 4°    |       |
| V2   | 0°          |      | 8°   | 0°     |       | 8°    |

| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.40        |      | 4.60 | 0.173  |       | 0.181 |
| B    | 0.61        |      | 0.88 | 0.024  |       | 0.035 |
| C    | 0.46        |      | 0.70 | 0.018  |       | 0.028 |
| C2   | 1.21        |      | 1.32 | 0.048  |       | 0.052 |
| C3   | 2.40        |      | 2.72 | 0.094  |       | 0.107 |
| D    | 8.60        |      | 9.70 | 0.339  |       | 0.382 |
| E    | 9.60        |      | 10.4 | 0.378  |       | 0.409 |
| F    | 6.20        |      | 6.60 | 0.244  |       | 0.260 |
| G    |             | 2.54 |      |        | 0.1   |       |
| H    | 28.0        |      | 29.8 | 1.102  |       | 1.173 |
| L1   |             | 3.75 |      |        | 0.148 |       |
| L2   | 1.14        |      | 1.70 | 0.045  |       | 0.067 |
| L3   | 2.65        |      | 2.95 | 0.104  |       | 0.116 |
| V1   |             | 45°  |      |        | 45°   |       |



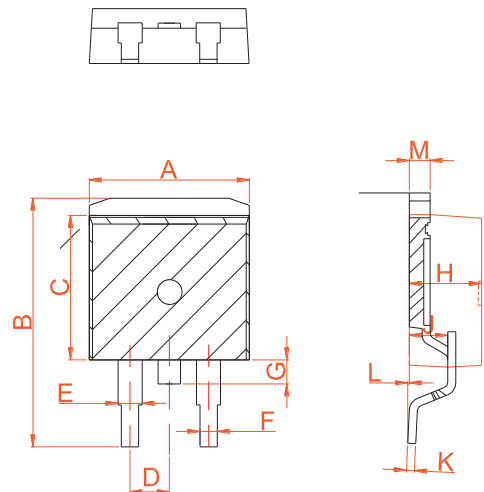
# PACKAGE MECHANICAL DATA



TO-251

| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 2.20        |      | 2.40 | 0.086  |       | 0.095 |
| A2   | 0.90        |      | 1.20 | 0.035  |       | 0.047 |
| B    | 0.55        |      | 0.65 | 0.022  |       | 0.026 |
| B2   | 5.10        |      | 5.40 | 0.200  |       | 0.213 |
| B3   | 0.76        |      | 0.85 | 0.030  |       | 0.033 |
| 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    |             | 2.30 |      |        | 0.091 |       |
| H    | 16.0        |      | 17.0 | 0.630  |       | 0.669 |
| L    | 8.90        |      | 9.40 | 0.350  |       | 0.370 |
| L1   | 1.80        |      | 1.90 | 0.071  |       | 0.075 |
| L2   | 1.37        |      | 1.50 | 0.054  |       | 0.059 |
| V1   |             | 4°   |      |        | 4°    |       |

| Ref. | Dimensions  |      |       |        |       |       |
|------|-------------|------|-------|--------|-------|-------|
|      | Millimeters |      |       | Inches |       |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ.  | Max.  |
| A    | 9.90        |      | 10.20 | 0.390  |       | 0.402 |
| B    | 14.70       |      | 15.80 | 0.579  |       | 0.622 |
| C    | 9.4         |      | 9.6   | 0.37   |       | 0.378 |
| D    |             | 2.54 |       |        | 0.100 |       |
| E    | 1.20        |      | 1.40  | 0.047  |       | 0.055 |
| F    | 0.75        |      | 0.85  | 0.029  |       | 0.033 |
| G    |             |      | 1.75  |        |       | 0.069 |
| H    | 4.40        |      | 4.70  | 0.173  |       | 0.185 |
| J    | 2.30        |      | 2.70  | 0.091  |       | 0.106 |
| K    | 0.38        |      | 0.55  | 0.015  |       | 0.022 |
| L    | 0           | 0.10 | 0.25  | 0      | 0.004 | 0.010 |
| M    | 1.25        |      | 1.35  | 0.049  |       | 0.053 |



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