

## GENERAL DESCRIPTION

Passivated guaranteed commutation triacs in a plastic envelope suitable for surface mounting, intended for use in motor control circuits or with other highly inductive loads. These devices balance the requirements of commutation performance and gate sensitivity. The "sensitive gate" E series and "logic level" D series are intended for interfacing with low power drivers, including micro controllers.

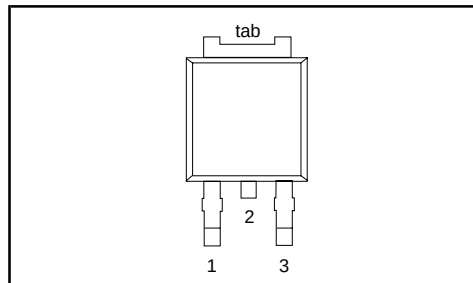
## QUICK REFERENCE DATA

| SYMBOL              | PARAMETER                            | MAX.                                             | MAX.                                   | UNIT |
|---------------------|--------------------------------------|--------------------------------------------------|----------------------------------------|------|
| $V_{\text{DRM}}$    | Repetitive peak off-state voltages   | <b>600D</b><br><b>600E</b><br><b>600F</b><br>600 | -<br><b>800E</b><br><b>800F</b><br>800 | V    |
| $I_{\text{T(RMS)}}$ | RMS on-state current                 | 8                                                | 8                                      | A    |
| $I_{\text{TSM}}$    | Non-repetitive peak on-state current | 65                                               | 65                                     | A    |

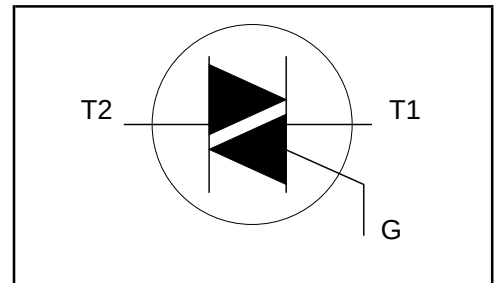
## PINNING - TO252

| PIN NUMBER | Standard S |
|------------|------------|
| 1          | MT1        |
| 2          | MT2        |
| 3          | gate       |
| tab        | MT2        |

## PIN CONFIGURATION



## SYMBOL



## LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

| SYMBOL              | PARAMETER                                                    | CONDITIONS                                                                                              | MIN. | MAX.                            |                    | UNIT             |
|---------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------|---------------------------------|--------------------|------------------|
| $V_{\text{DRM}}$    | Repetitive peak off-state voltages                           |                                                                                                         | -    | <b>-600</b><br>600 <sup>1</sup> | <b>-800</b><br>800 | V                |
| $I_{\text{T(RMS)}}$ | RMS on-state current                                         | full sine wave;<br>$T_{\text{mb}} \leq 102^\circ\text{C}$                                               | -    | 8                               |                    | A                |
| $I_{\text{TSM}}$    | Non-repetitive peak on-state current                         | full sine wave;<br>$T_j = 25^\circ\text{C}$ prior to surge                                              | -    | 65                              |                    | A                |
| $I^2t$              | $I^2t$ for fusing                                            | $t = 20\text{ ms}$                                                                                      | -    | 72                              |                    | A                |
| $di_t/dt$           | Repetitive rate of rise of on-state current after triggering | $t = 16.7\text{ ms}$                                                                                    | -    | 21                              |                    | A <sup>2</sup> s |
|                     |                                                              | $t = 10\text{ ms}$                                                                                      | -    | 100                             |                    | A/ $\mu\text{s}$ |
| $I_{\text{GM}}$     | Peak gate current                                            | $I_{\text{TM}} = 12\text{ A}; I_{\text{G}} = 0.2\text{ A}; di_{\text{G}}/dt = 0.2\text{ A}/\mu\text{s}$ | -    | 2                               |                    | A                |
| $V_{\text{GM}}$     | Peak gate voltage                                            |                                                                                                         | -    | 5                               |                    | V                |
| $P_{\text{GM}}$     | Peak gate power                                              |                                                                                                         | -    | 5                               |                    | W                |
| $P_{\text{G(AV)}}$  | Average gate power                                           | over any 20 ms period                                                                                   | -    | 0.5                             |                    | W                |
| $T_{\text{stg}}$    | Storage temperature                                          |                                                                                                         | -40  | 150                             |                    | $^\circ\text{C}$ |
| $T_j$               | Operating junction temperature                               |                                                                                                         | -    | 125                             |                    | $^\circ\text{C}$ |

<sup>1</sup> Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed 6 A/ $\mu\text{s}$ .

## THERMAL RESISTANCES

| SYMBOL         | PARAMETER                                       | CONDITIONS                                              | MIN. | TYP. | MAX. | UNIT |
|----------------|-------------------------------------------------|---------------------------------------------------------|------|------|------|------|
| $R_{th\ j-mb}$ | Thermal resistance<br>junction to mounting base | full cycle                                              | -    | -    | 2.0  | K/W  |
| $R_{th\ j-a}$  | Thermal resistance<br>junction to ambient       | half cycle<br>pcb (FR4) mounted; footprint as in Fig.14 | -    | -    | 2.4  | K/W  |
|                |                                                 |                                                         | -    | 75   | -    | K/W  |

## STATIC CHARACTERISTICS

$T_j = 25\ ^\circ\text{C}$  unless otherwise stated

| SYMBOL   | PARAMETER                         | CONDITIONS                                                                                                          | MIN. | TYP. | MAX.        |             |             | UNIT |
|----------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------|------|------|-------------|-------------|-------------|------|
|          |                                   | <b>BTA208S-</b>                                                                                                     |      |      | <b>...D</b> | <b>...E</b> | <b>...F</b> |      |
| $I_{GT}$ | Gate trigger current <sup>2</sup> | $V_D = 12\text{ V}; I_T = 0.1\text{ A}$<br>T2+ G+<br>T2+ G-<br>T2- G-                                               | -    | -    | 5           | 10          | 25          | mA   |
|          |                                   |                                                                                                                     | -    | -    | 5           | 10          | 25          | mA   |
|          |                                   |                                                                                                                     | -    | -    | 5           | 10          | 25          | mA   |
| $I_L$    | Latching current                  | $V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$<br>T2+ G+<br>T2+ G-<br>T2- G-                                            | -    | -    | 15          | 20          | 25          | mA   |
|          |                                   |                                                                                                                     | -    | -    | 25          | 30          | 40          | mA   |
|          |                                   |                                                                                                                     | -    | -    | 25          | 30          | 40          | mA   |
| $I_H$    | Holding current                   | $V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$                                                                          | -    | -    | 15          | 25          | 30          | mA   |
| $V_T$    | On-state voltage                  | $I_T = 10\text{ A}$                                                                                                 | -    | 1.3  | 1.65        |             |             | V    |
| $V_{GT}$ | Gate trigger voltage              | $V_D = 12\text{ V}; I_T = 0.1\text{ A}$<br>$V_D = 400\text{ V}; I_T = 0.1\text{ A};$<br>$T_j = 125\ ^\circ\text{C}$ | -    | 0.7  | 1.5         |             |             | V    |
|          |                                   |                                                                                                                     | 0.25 | 0.4  | -           |             |             | V    |
| $I_D$    | Off-state leakage current         | $V_D = V_{DRM(max)};$<br>$T_j = 125\ ^\circ\text{C}$                                                                | -    | 0.1  | 0.5         |             |             | mA   |

## DYNAMIC CHARACTERISTICS

$T_j = 25\ ^\circ\text{C}$  unless otherwise stated

| SYMBOL        | PARAMETER                                         | CONDITIONS                                                                                                                                          | MIN.        |             |             | TYP. | MAX. | UNIT             |
|---------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|------|------|------------------|
|               |                                                   | <b>BTA208S-</b>                                                                                                                                     | <b>...D</b> | <b>...E</b> | <b>...F</b> |      |      |                  |
| $dV_D/dt$     | Critical rate of rise of<br>off-state voltage     | $V_{DM} = 67\% V_{DRM(max)};$<br>$T_j = 110\ ^\circ\text{C};$ exponential<br>waveform; gate open<br>circuit                                         | 30          | 60          | 70          |      | -    | V/ $\mu\text{s}$ |
| $dI_{com}/dt$ | Critical rate of change of<br>commutating current | $V_{DM} = 400\text{ V}; T_j = 110\ ^\circ\text{C};$<br>$I_{T(RMS)} = 8\text{ A};$<br>$dV_{com}/dt = 20\text{ V}/\mu\text{s};$ gate<br>open circuit  | 1.8         | 3.5         | 4.5         |      | -    | A/ms             |
| $dI_{com}/dt$ | Critical rate of change of<br>commutating current | $V_{DM} = 400\text{ V}; T_j = 110\ ^\circ\text{C};$<br>$I_{T(RMS)} = 8\text{ A};$<br>$dV_{com}/dt = 0.1\text{ V}/\mu\text{s};$ gate<br>open circuit | 3.5         | 4.5         | 5.5         |      | -    | A/ms             |
| $t_{gt}$      | Gate controlled turn-on<br>time                   | $I_{TM} = 12\text{ A}; V_D = V_{DRM(max)};$<br>$I_G = 0.1\text{ A}; dI_G/dt = 5\text{ A}/\mu\text{s}$                                               | -           | -           | -           | 2    | -    | $\mu\text{s}$    |

<sup>2</sup> Device does not trigger in the T2-, G+ quadrant.

## MECHANICAL DATA

Dimensions in mm

Net Mass: 1.1 g

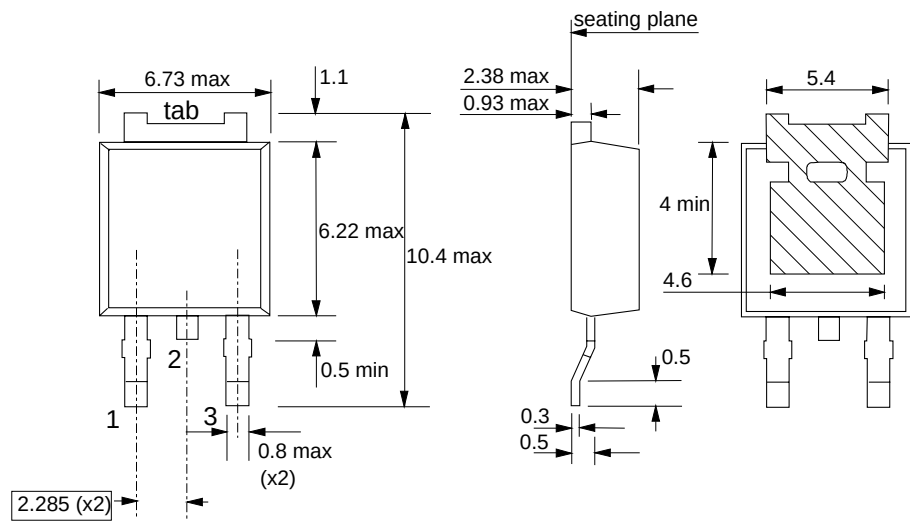


Fig.1. TO252 : centre pin connected to tab.

## MOUNTING INSTRUCTIONS

Dimensions in mm

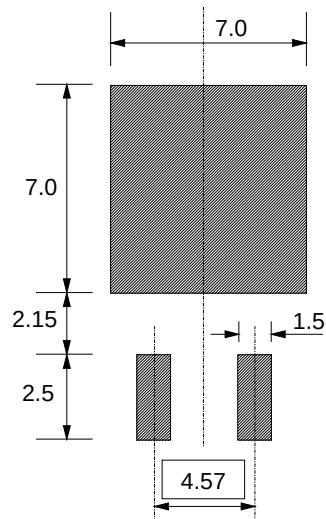


Fig.2. TO252 : minimum pad sizes for surface mounting.

### Notes

1. Plastic meets UL94 V0 at 1/8".