

1、Description

Designed primarily for industrial and consumer applications for full wave control of ac loads such as appliance controls, heater controls, motor controls, and other power switching applications.

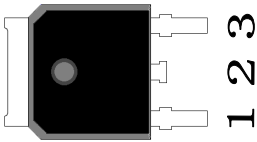

2、Applications

- Motor control
- Industrial and domestic lighting
- Heating
- Static switching

3、Features

- Blocking voltage to 600 V
- On-state RMS current to 8 A
- Ultra low gate trigger current
- Low cost package.

4、Pinning information

| PIN | Description | Simplified outline | Symbol |
|-----|---------------------|---|---|
| 1 | main terminal 1(T1) |  TO-252 |  |
| 2 | main terminal 2(T2) | | |
| 3 | gate (G) | | |
| tab | main terminal T2 | | |

5、Quick reference data

| SYMBOL | PARAMETER | MAX | UNIT |
|---------------------|--------------------------------------|-----|------|
| V_{DRM} V_{RRM} | Repetitive peak off-state voltages | 600 | V |
| $I_{T(RMS)}$ | RMS on-state current | 8 | A |
| I_{TSM} | Non-repetitive peak on-state current | 80 | A |

6、Thermal characteristics

| SYMBOL | PARAMETER | Value | UNIT |
|---------------|----------------------|---------------|------|
| $R_{th(j-c)}$ | junction to case(AC) | TO-252 4.0 | °C/W |

7、 Limiting value

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

| SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT |
|------------------------|------------------------------------|---|-----|-----|----------------------|
| V_{DRM} V_{RRM} | Repetitive peak off-state voltages | | - | 600 | V |
| $I_{T(RMS)}$ | RMS on-state current | Full Cycle Sine Wave 50 to 60 Hz (TC = 110°C) | - | 8 | A |
| I_{TSM} | Non-repetitive peak Surge current | One Full cycle, 60 Hz, $T_J = +110^\circ\text{C}$ | - | 80 | A |
| I^2t | I^2t for fusing | $t = 8.3\text{ms}$ | - | 32 | A^2s |
| I_{GM} | Peak gate current | Pulse Width $\leq 1.0 \mu\text{s}$, TC = 85°C | - | 4 | A |
| P_{GM} | Peak gate power | Pulse Width $\leq 1.0 \mu\text{s}$, TC = 85°C | - | 5 | W |
| $P_{G(AV)}$ | Average gate power | Pulse Width $\leq 1.0 \mu\text{s}$, TC = 85°C | - | 1 | W |
| T_{stg} | Storage temperature | | -40 | 150 | °C |
| T_J | Operating junction temperature | | -40 | 125 | °C |

8、 Characteristics

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

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------------|--|--|-----|-----|-----|------------------|
| Static characteristics | | | | | | |
| I_{GT} | Gate trigger current | $V_D = 12 \text{ V}$; $I_T = 0.1 \text{ A}$ T2+ G+ T2+ G- T2- G- | - | - | 10 | mA |
| | | | - | - | 10 | mA |
| | | | - | - | 10 | mA |
| I_L | Latching current | $V_D = 12 \text{ V}$; $I_{GT} = 0.1 \text{ A}$ T2+ G+ T2+ G- T2- G- | - | - | 20 | mA |
| | | | - | - | 35 | mA |
| | | | - | - | 20 | mA |
| I_H | Holding current | Main Terminal Voltage = 12 Vdc, Gate Open, Initiating Current $\leq 1 \text{ A}$ dc $T_J = 25^\circ\text{C}$ | - | - | 15 | mA |
| V_{TM} | On-state voltage | $I_{TM} = 11 \text{ A}$, $t_p = 380 \mu\text{s}$ | - | - | 1.7 | V |
| V_{GT} | Gate trigger voltage (Continuous dc) | Main Terminal Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$, $T_J = -40^\circ\text{C}$ All Quadrants | - | - | 1.5 | V |
| V_{GD} | Gate Non-Trigger Voltage | $V_D = V_{DRM}$ $T_J = 125^\circ\text{C}$ $R_L = 3.3 \text{ K}\Omega$ | 0.2 | - | - | V |
| Dynamic Characteristics | | | | | | |
| dV/dt | Critical rate of rise of off-state voltage | $V_{DM} = 67\% V_{DRM(max)}$; $T_J = 125^\circ\text{C}$; Exponential wave form; $R_{GK} = 1 \text{ K}\Omega$ | 100 | - | - | V/ μs |

9. Electrical Characteristics Curve

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

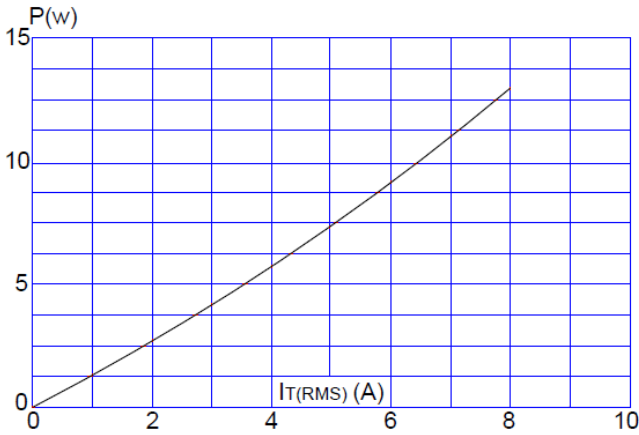


FIG.2: RMS on-state current versus case temperature

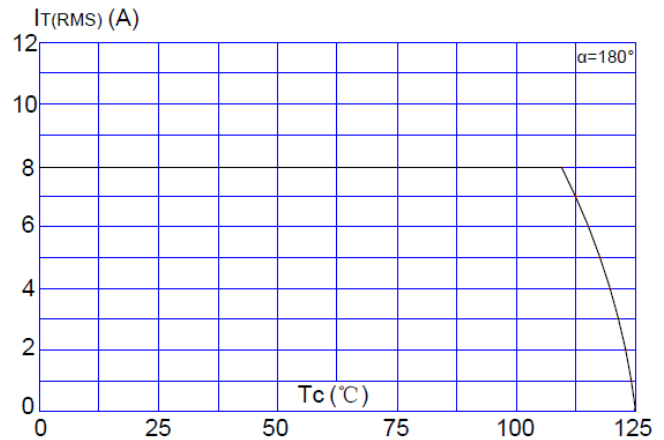


FIG.3: Surge peak on-state current versus number of cycles

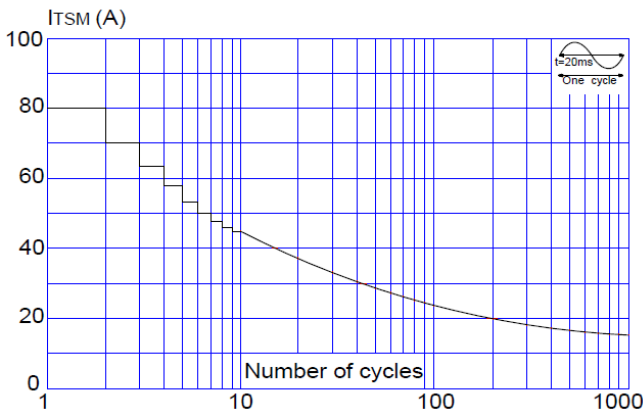


FIG.4: On-state characteristics (maximum values)

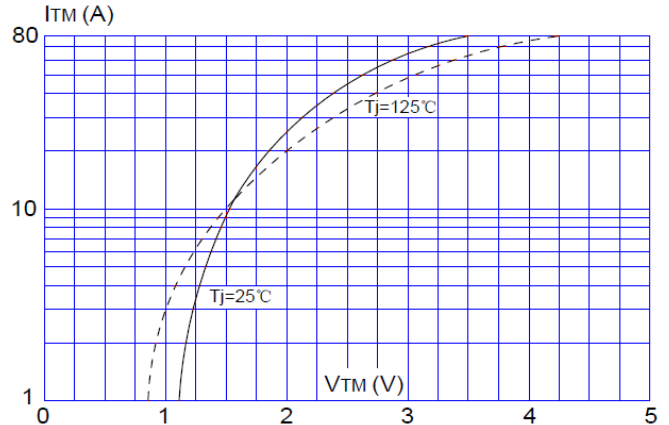


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t ($di/dt < 50\text{A}/\mu\text{s}$)

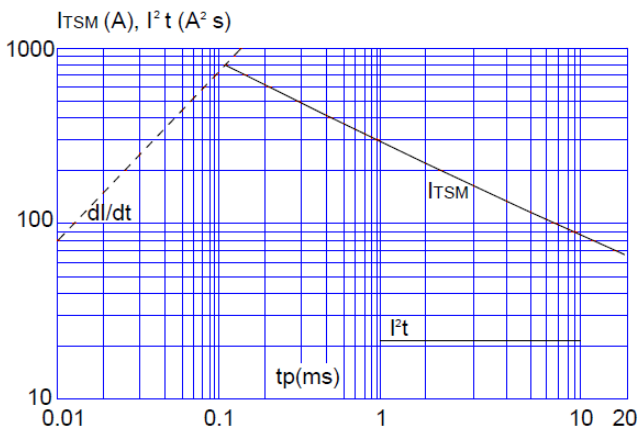
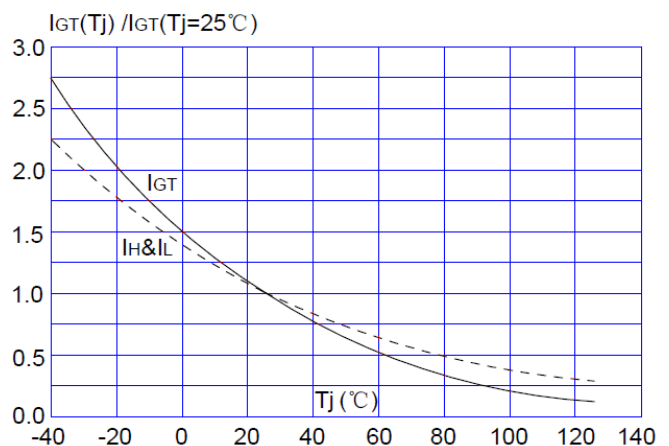
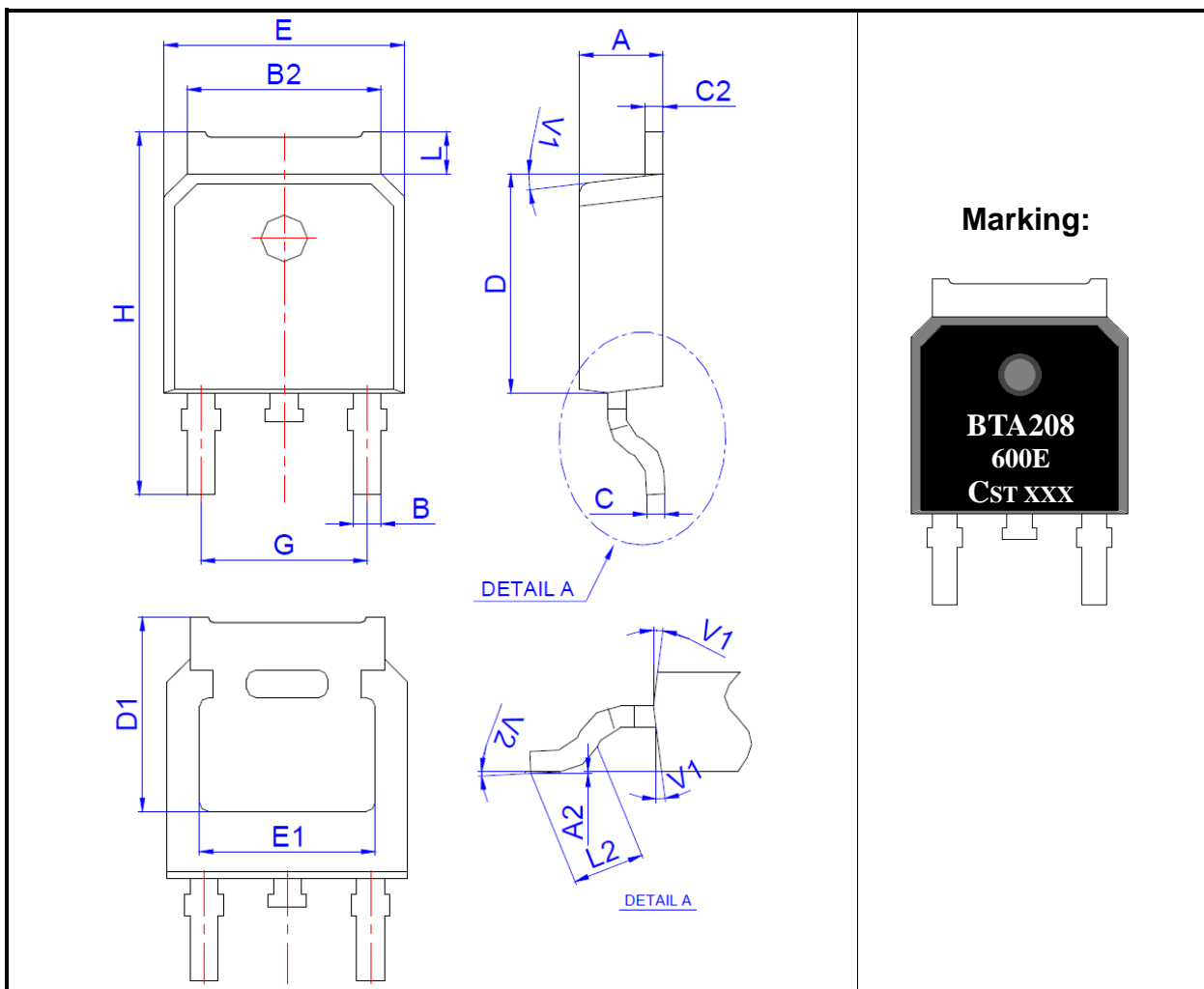


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



10、 Package outline(TO-252)



| DIM | Inches | | | Millimeters | | |
|-----|--------|----------|-------|-------------|---------|-------|
| | Min | Type | Max | Min | Type | Max |
| A | 0.083 | - | 0.098 | 2.10 | - | 2.50 |
| A2 | 0.001 | - | 0.009 | 0.03 | - | 0.23 |
| B | 0.026 | - | 0.034 | 0.66 | - | 0.86 |
| B2 | 0.202 | - | 0.216 | 5.18 | - | 5.48 |
| C | 0.016 | - | 0.024 | 0.40 | - | 0.60 |
| C2 | 0.017 | - | 0.023 | 0.44 | - | 0.58 |
| D | 0.232 | - | 0.248 | 5.90 | - | 6.30 |
| D1 | | 0.209REF | | | 5.30REF | |
| E | 0.252 | - | 0.268 | 6.40 | - | 6.80 |
| E1 | 0.182 | | | 4.63 | | |
| G | 0.176 | - | 0.184 | 4.47 | - | 4.67 |
| H | 0.374 | - | 0.421 | 9.50 | - | 10.70 |
| L | 0.043 | - | 0.048 | 1.09 | - | 1.21 |
| L2 | 0.053 | - | 0.065 | 1.35 | - | 1.65 |
| V1 | | 7° | | | 7° | |
| V2 | 0° | | 6° | 0° | | 6° |

CST