

### 8 A MOLD ISOLATED SCR

#### DESCRIPTION

The 8P2SMA and 8P4SMA are P gate all diffused mold type thyristor granted 8 A on-state average current ( $T_c = 88^\circ\text{C}$ ), with rated voltages up to 400 V.

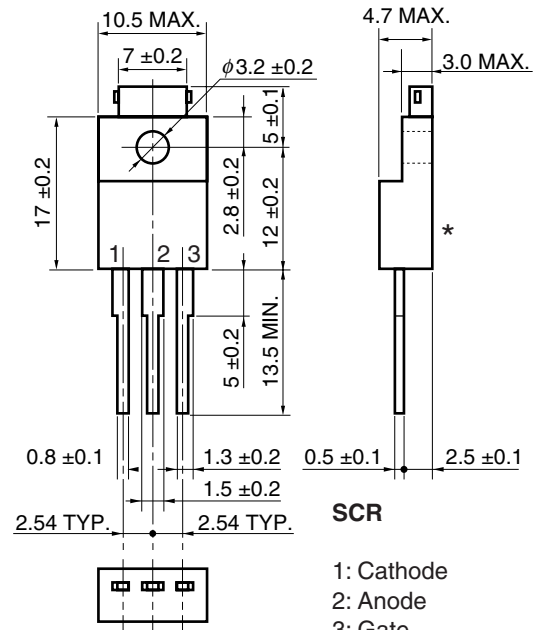
#### FEATURES

- Mold isolated plastic package
- 100 A surge current
- High voltage:  $V_{\text{DRM}}, V_{\text{RRM}} = 200 \text{ V}$  (8P2SMA)  
 $V_{\text{DRM}}, V_{\text{RRM}} = 400 \text{ V}$  (8P4SMA)

#### APPLICATIONS

- Motor speed control for household appliance
- Temperature control for heater and constant temperature box
- Constant voltage power source and battery charger
- Automotive application such as regulator
- Various solid state relay, etc.

#### ★ PACKAGE DRAWING (Unit: mm)



#### SCR

- 1: Cathode
- 2: Anode
- 3: Gate

\*:  $T_c$  test bench-mark

Standard weight: 2 g

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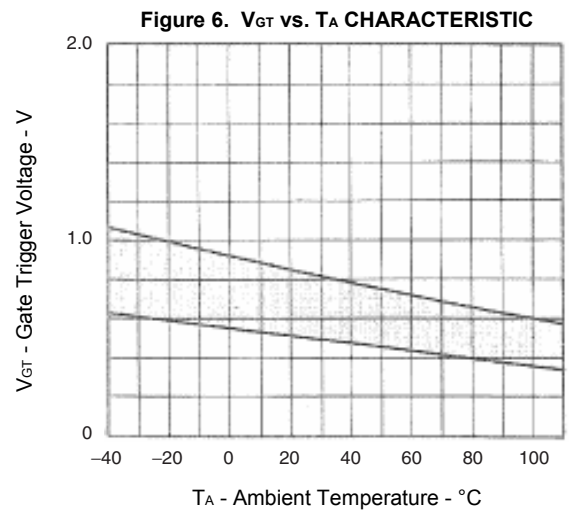
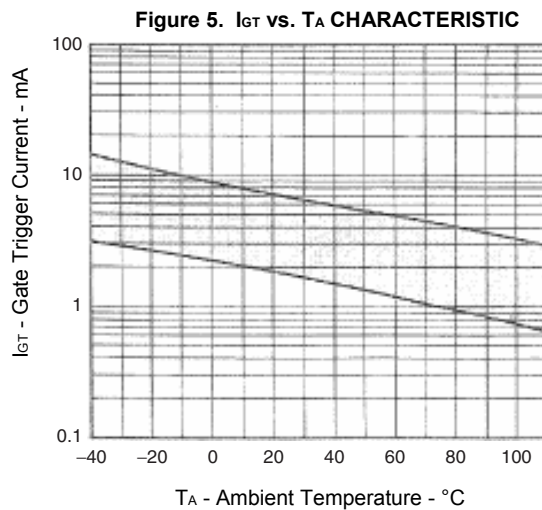
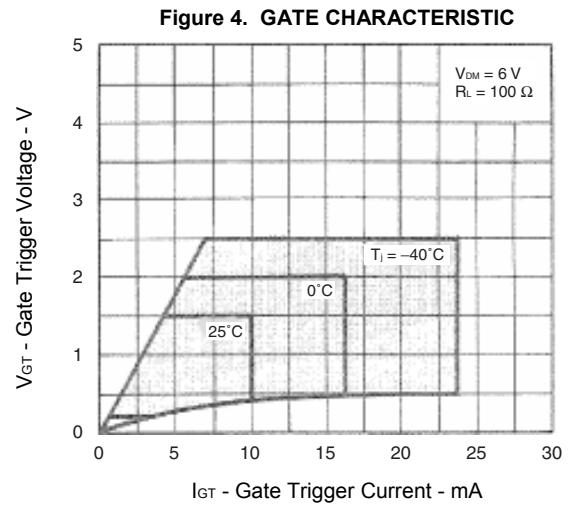
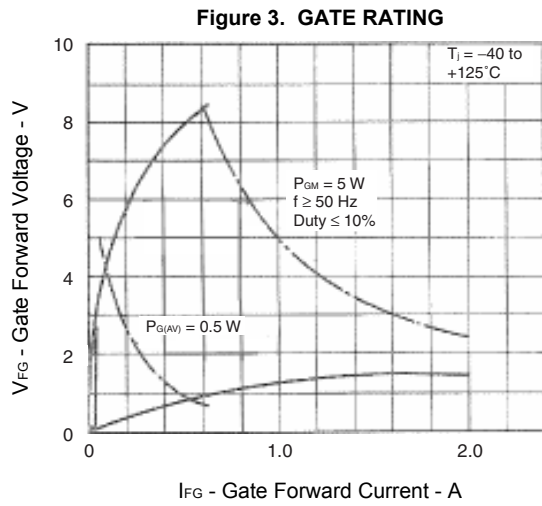
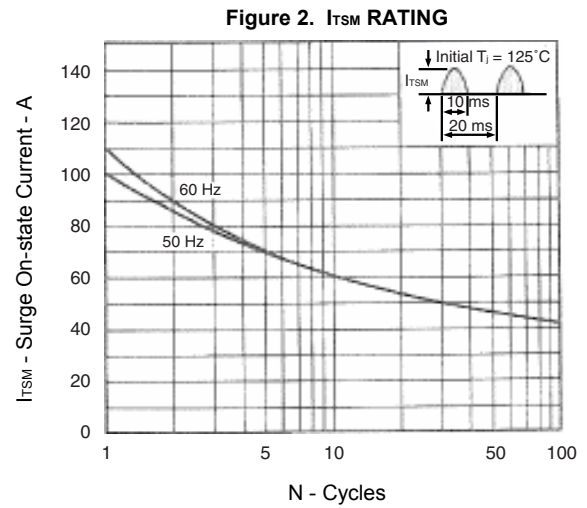
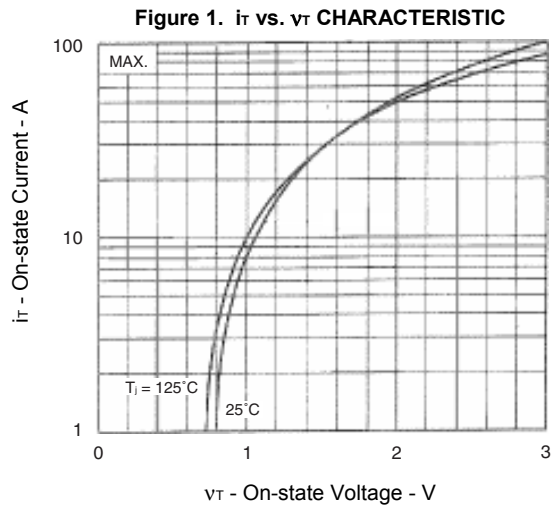
★ MAXIMUM RATINGS

| Parameter                              | Symbol          | 8P2SMA   | 8P4SMA | Unit             | Remarks                                      |
|--|-----------------|--|--------|------------------|--|
| Non-repetitive Peak Reverse Voltage    | $V_{RSM}$       | 300  | 500    | V                | –  |
| Non-repetitive Peak Off-state Voltage  | $V_{DSM}$       | 300  | 500    | V                | –  |
| Repetitive Peak Reverse Voltage        | $V_{RRM}$       | 200  | 400    | V                | –  |
| Repetitive Peak Off-state Voltage      | $V_{DRM}$       | 200  | 400    | V                | –  |
| Average On-state Current               | $I_{T(AV)}$     | 8 ( $T_C = 88^\circ\text{C}$ , single phase half wave, $\theta = 180^\circ$ )        |        | A                | Refer to <b>Figure 11</b><br>and <b>12</b> . |
| Effective On-state Current             | $I_{T(RMS)}$    | 12.6   |        | A                |  |
| Surge On-state Current                 | $I_{TSM}$       | 100 (f = 50 Hz, sine half wave, 1 cycle)<br>110 (f = 60 Hz, sine half wave, 1 cycle) |        | A                | Refer to <b>Figure 2</b> .                   |
| Fusing Current                         | $\int i_t^2 dt$ | 45 (1 ms ≤ t ≤ 10 ms)  |        | A <sup>2</sup> s | –  |
| Critical Rate Rise of On-state Current | $di/dt$         | 50   |        | A/μs             | –  |
| Peak Gate Power Dissipation            | $P_{GM}$        | 5 (f ≥ 50 Hz, Duty ≤ 10%)  |        | W                | Refer to <b>Figure 3</b> .                   |
| Average Gate Power Dissipation         | $P_{G(AV)}$     | 0.5  |        | W                |  |
| Peak Gate Forward Current              | $I_{FGM}$       | 2 (f ≥ 50 Hz, Duty ≤ 10%)  |        | A                | –  |
| Peak Gate Reverse Voltage              | $V_{RGM}$       | 10   |        | V                | –  |
| Junction Temperature                   | $T_j$           | –40~+125   |        | °C               | –  |
| Storage Temperature                    | $T_{stg}$       | –55~+150   |        | °C               | –  |

★ ELECTRICAL CHARACTERISTICS ( $T_j = 25^\circ\text{C}$ )

| Parameter                               | Symbol        | Conditions  | MIN.                      | TYP. | MAX. | Unit | Remarks                     |   |
|---|---------------|---|---------------------------|------|------|------|-----------------------------|---|
| Repetitive Peak Reverse Current         | $I_{RRM}$     | $V_{RM} = V_{RRM}$  | $T_j = 25^\circ\text{C}$  | –    | –    | 100  | μA                          | – |
|   |               |   | $T_j = 125^\circ\text{C}$ | –    | –    | 2    | mA                          | – |
| Repetitive Peak Off-state Current       | $I_{DRM}$     | $V_{DM} = V_{DRM}$  | $T_j = 25^\circ\text{C}$  | –    | –    | 100  | μA                          | – |
|   |               |   | $T_j = 125^\circ\text{C}$ | –    | –    | 2    | mA                          | – |
| On-state Voltage                        | $V_{TM}$      | $I_{TM} = 25\text{ A}$  | –                         | –    | 1.4  | V    | Refer to <b>Figure 1</b> .  |   |
| Gate Trigger Current                    | $I_{GT}$      | $V_{DM} = 6\text{ V}$ , $R_L = 100\ \Omega$   | –                         | –    | 10   | mA   | Refer to <b>Figure 4</b> .  |   |
| Gate Trigger Voltage                    | $V_{GT}$      | $V_{DM} = 6\text{ V}$ , $R_L = 100\ \Omega$   | –                         | –    | 1.5  | V    |                             |   |
| Gate Non-trigger Voltage                | $V_{GD}$      | $T_j = 125^\circ\text{C}$ , $V_{DM} = \frac{1}{2} V_{DRM}$  | 0.2                       | –    | –    | V    | –                           |   |
| Holding Current                         | $I_H$         | $V_{DM} = 24\text{ V}$ , $I_{TM} = 25\text{ A}$   | –                         | 6    | –    | mA   | –                           |   |
| Critical Rate Rise of Off-state Voltage | $dv/dt$       | $T_j = 125^\circ\text{C}$ , $V_{DM} = \frac{2}{3} V_{DRM}$  | –                         | 40   | –    | V/μs | –                           |   |
| Circuit Commuted Turn-off Time          | $t_q$         | $T_j = 125^\circ\text{C}$ , $I_{TM} = 8\text{ A}$<br>$di/dt = 15\text{ A}/\mu\text{s}$ , $V_R \geq 25\text{ V}$ ,<br>$V_{DM} = \frac{2}{3} V_{DRM}$ , $dV_D/dt = 10\text{ V}/\mu\text{s}$ | –                         | 100  | –    | μs   | –                           |   |
| Thermal Resistance <sup>Note</sup>      | $R_{th(j-c)}$ | Junction to case DC   | –                         | –    | 3.7  | °C/W | Refer to <b>Figure 13</b> . |   |
|   | $R_{th(j-a)}$ | Junction to ambient DC  | –                         | –    | 60   | °C/W |                             |   |

TYPICAL CHARACTERISTICS



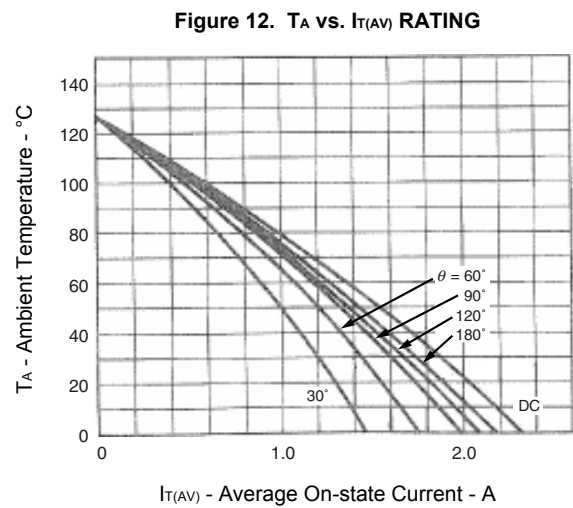
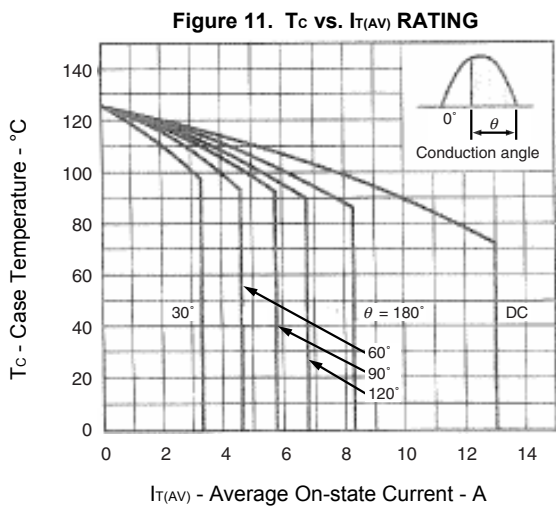
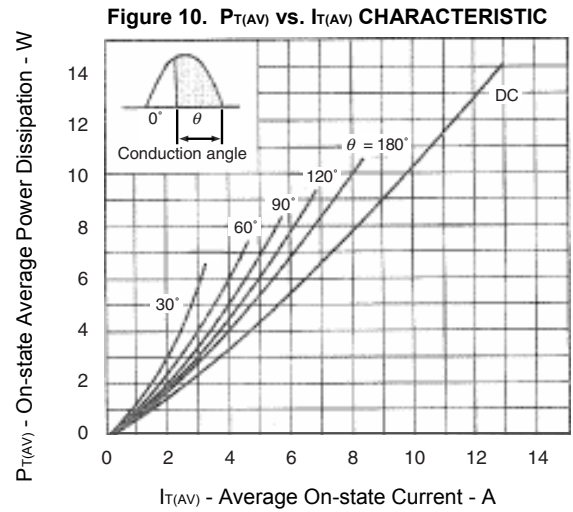
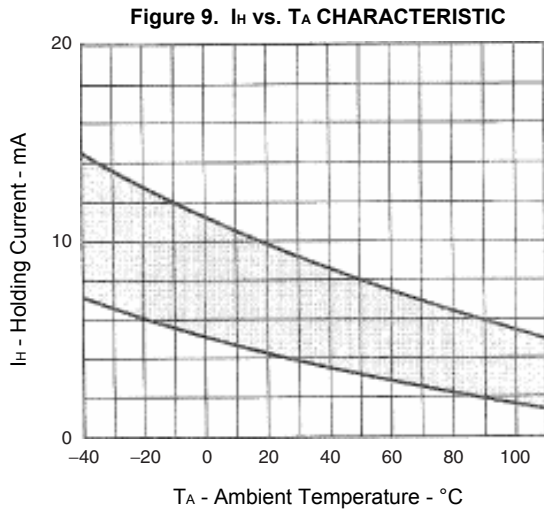
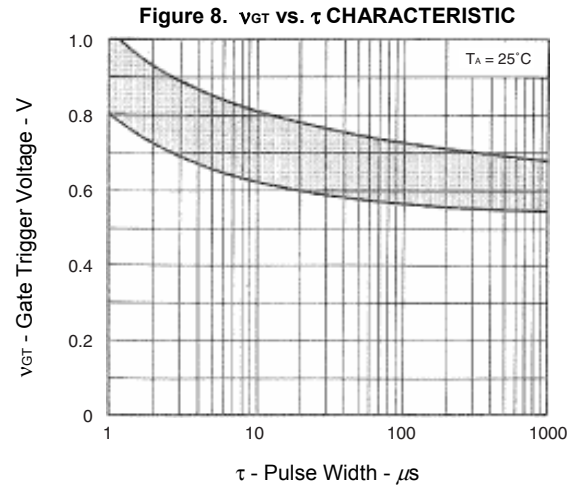
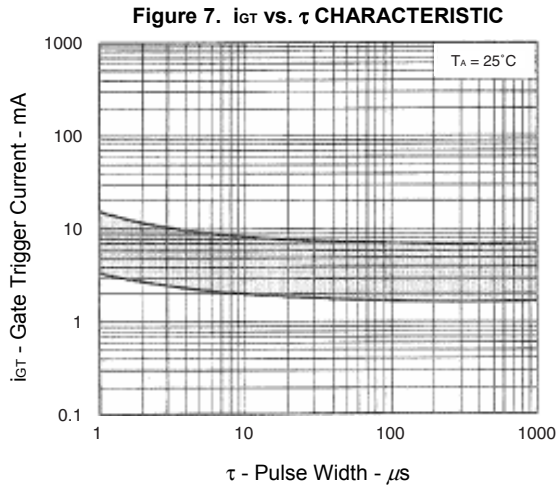
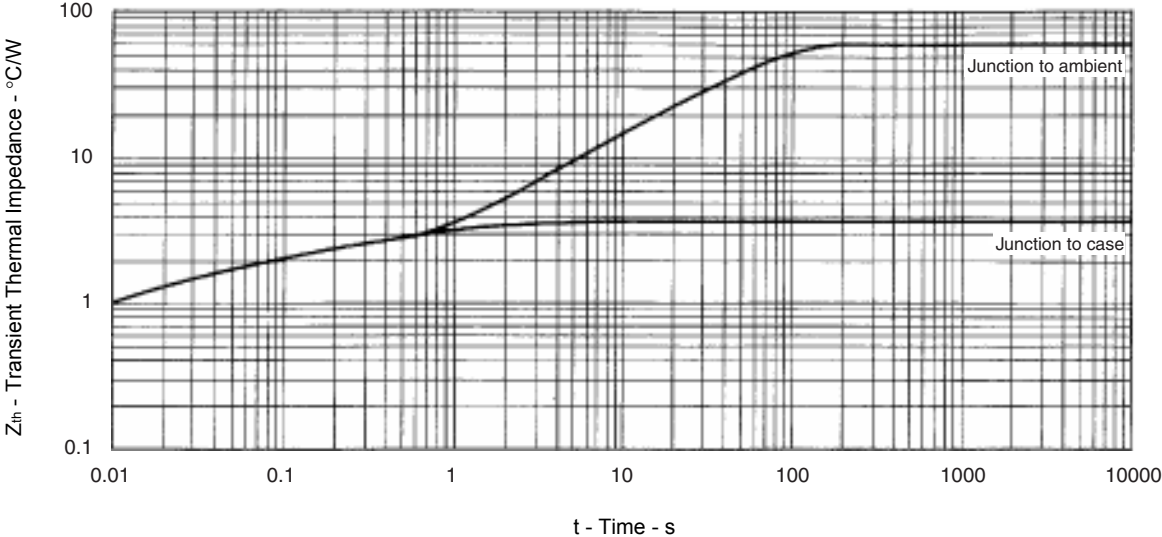


Figure 13.  $Z_{th}$  CHARACTERISTIC



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