

THYRISTORS

AC05DSMA, AC05FSMA

5 A RESIN INSULATION TYPE TRIAC

DESCRIPTION

The AC05DSMA and AC05FSMA are resin insulation type TRIACs with an effective current of 5 A ($T_c = 99^\circ\text{C}$).

These products are covered with resin mold on the entire case and are electrically insulated with electrodes, giving them a considerable advantage over conventional TRIACs when mounting on a heatsink board or performing high-density mounting.

These products features ratings and electrical characteristics equal to TO-220AB package TRIAC and a high reliability design.

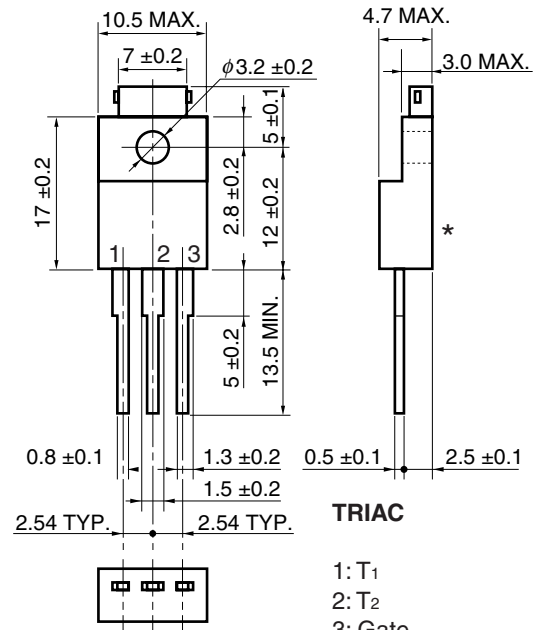
FEATURES

- Insulation type TRIAC fully covered with resin on the entire case other than electrode leads
- Insulation voltage and conduction equal to conventional mica and polyester film
- Can be replaced with TO-220AB package
- High allowable on-current when using a single unit

APPLICATIONS

Non-contact switches of motor speed control, heater temperature control, lamp light control

★ PACKAGE DRAWING (Unit: mm)



*: T_c test bench-mark

Standard weight: 2 g

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MAXIMUM RATINGS

| Parameter | Symbol | AC05DSMA | AC05FSMA | Unit | Remarks |
|--|---------------------|--|----------|------------------|---|
| Non-repetitive Peak Off-state Voltage | V _{DSM} | 500 | 700 | V | – |
| Repetitive Peak Off-state Voltage | V _{DRM} | 400 | 600 | V | – |
| Effective On-state Current | I _{T(RMS)} | 5 (T _c = 99°C) | | A | Refer to Figure 11 and 12 . |
| Surge On-state Current | I _{TSM} | 50 (50 Hz 1 cycle) 55 (60 Hz 1 cycle) | | A | Refer to Figure 2 . |
| Fusing Current | $\int i_T^2 dt$ | 10 (1 ms ≤ t ≤ 10 ms) | | A ² s | – |
| Critical Rate Rise of On-state Current | di _T /dt | 50 | | A/μs | – |
| Peak Gate Power Dissipation | P _{GM} | 3 (f ≥ 50 Hz, Duty ≤ 10%) | | W | – |
| Average Gate Power Dissipation | P _{G(AV)} | 0.3 | | W | – |
| Peak Gate Current | I _{GM} | ±1.5 (f ≥ 50 Hz, Duty ≤ 10%) | | A | – |
| Junction Temperature | T _j | –40~+125 | | °C | – |
| Storage Temperature | T _{stg} | –55~+150 | | °C | – |

ELECTRICAL CHARACTERISTICS (T_j = 25°C)

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit | Remarks | |
|---|--------|----------------------|---|------------------------|------|------|------|-----------------------------|----------------------------|
| Repetitive Peak Off-state Current | | I _{DRM} | V _{DM} = V _{DRM} | T _j = 25°C | – | – | 100 | μA | – |
| | | | | T _j = 125°C | – | – | 1 | mA | – |
| On-state Voltage | | V _{TM} | I _{TM} = 5 A | – | – | 1.8 | V | Refer to Figure 1 . | |
| Gate Trigger Current | Mode I | I _{GT} | V _{DM} = 12 V, R _L = 30 Ω | T ₂₊ , G+ | – | – | 10 | mA | Refer to Figure 4 . |
| | II | | | T _{2–} , G+ | – | – | – | | |
| | III | | | T _{2–} , G– | – | – | 10 | | |
| | IV | | | T ₂₊ , G– | – | – | 10 | | |
| Gate Trigger Voltage | Mode I | V _{GT} | V _{DM} = 12 V, R _L = 30 Ω | T ₂₊ , G+ | – | – | 1.5 | V | Refer to Figure 4 . |
| | II | | | T _{2–} , G+ | – | – | – | | |
| | III | | | T _{2–} , G– | – | – | 1.5 | | |
| | IV | | | T ₂₊ , G– | – | – | 1.5 | | |
| Gate Non-trigger Voltage | | V _{GD} | T _j = 125°C, V _{DM} = $\frac{1}{2}$ V _{DRM} | 0.2 | – | – | V | – | |
| Holding Current | | I _H | V _{DM} = 24 V | – | 10 | – | mA | – | |
| Critical Rate Rise of Off-state Voltage | | dv/dt | T _j = 125°C, V _{DM} = $\frac{2}{3}$ V _{DRM} | – | 100 | – | V/μs | – | |
| Commutating Critical Rate Rise of Off-state Voltage | | (dv/dt) _c | T _j = 125°C, (di _T /dt) _c = –2.7 A/ms, V _D = 400 V | 5 | – | – | V/μs | – | |
| Thermal Resistance ^{Note} | | R _{th(j-c)} | Junction-to-case AC | – | – | 4.2 | °C/W | Refer to Figure 13 . | |

Note The thermal resistance with a 50 Hz or 60 Hz sine wave current, as shown in the following expression:

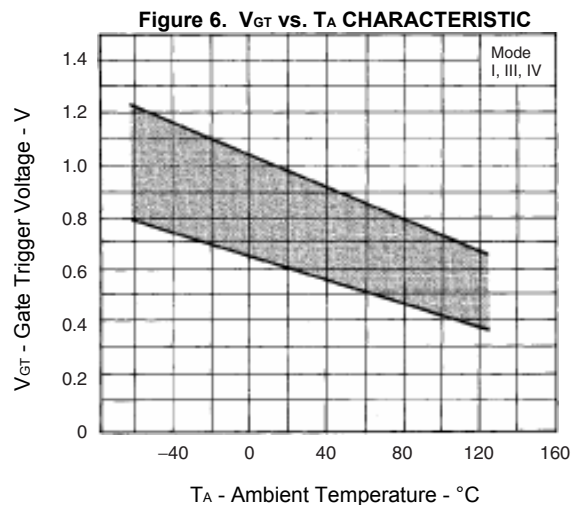
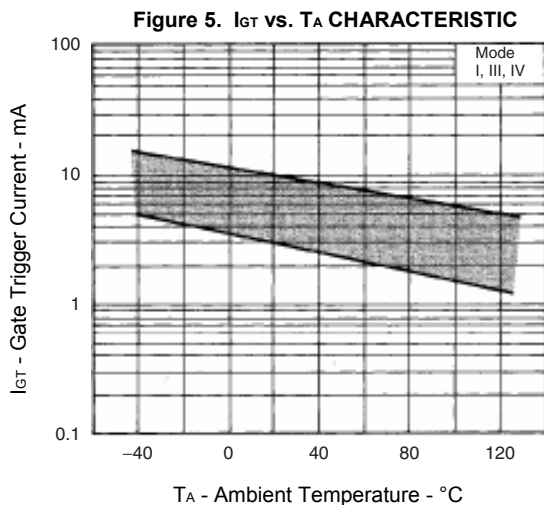
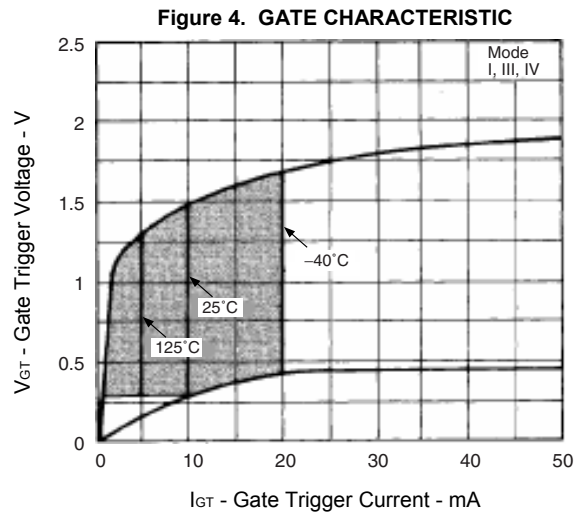
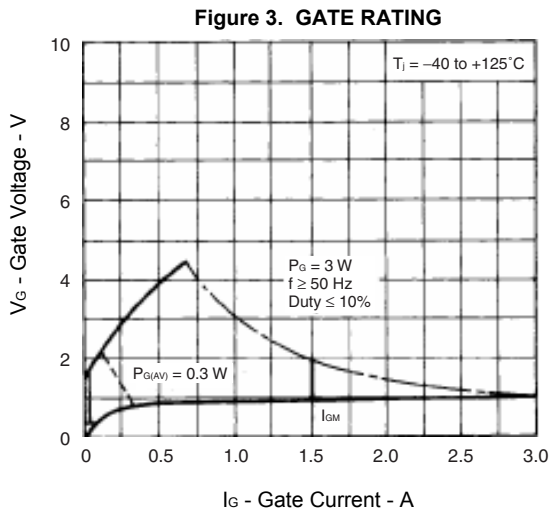
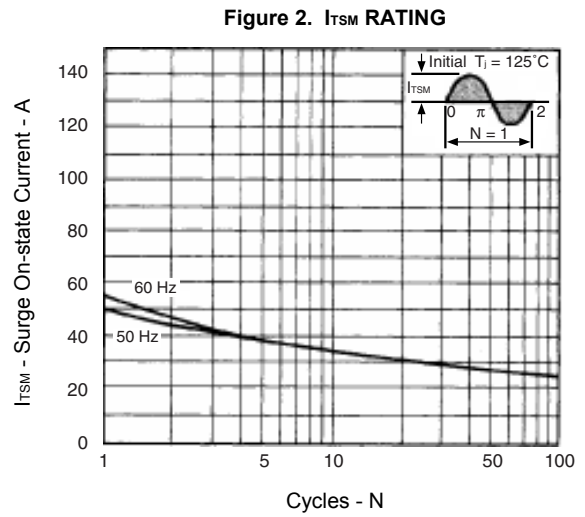
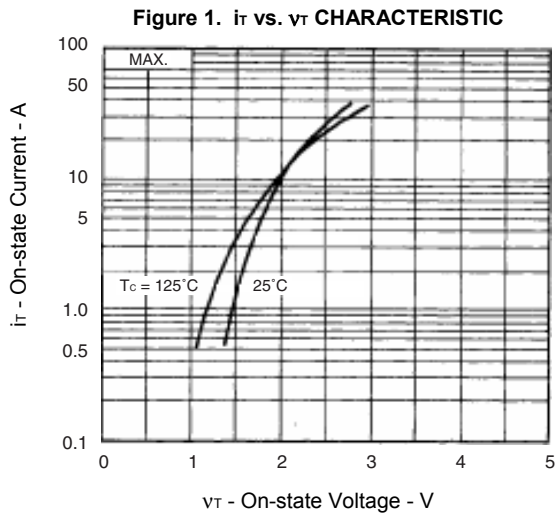
$$R_{th(j-c)} = \frac{T_{j(max)} - T_c}{P_{T(AV)}}$$

T_{j(max)}: Maximum junction temperature

T_c: Case temperature

P_{T(AV)}: Average on-dissipation

TYPICAL CHARACTERISTICS



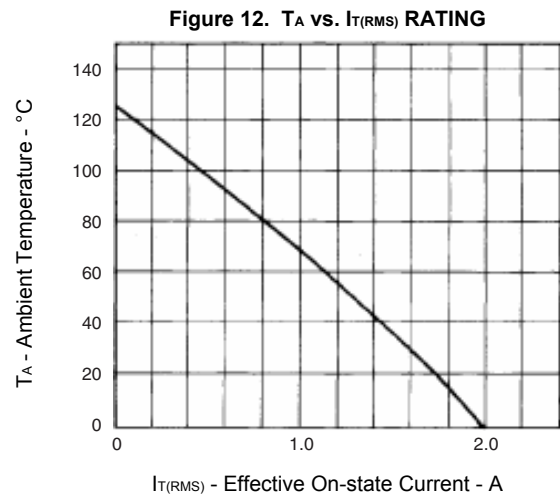
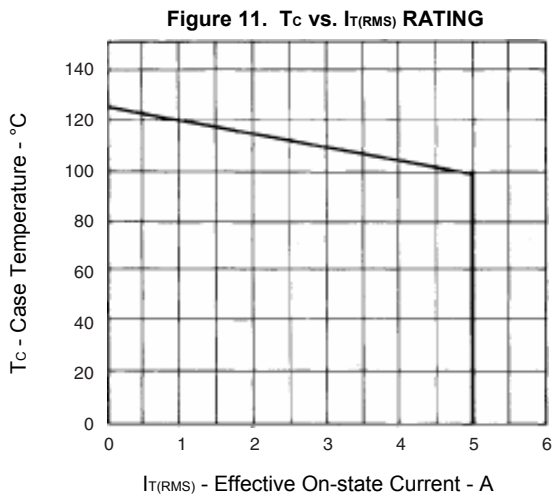
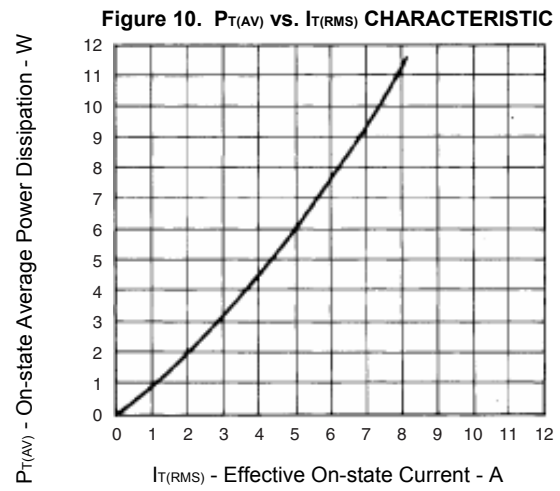
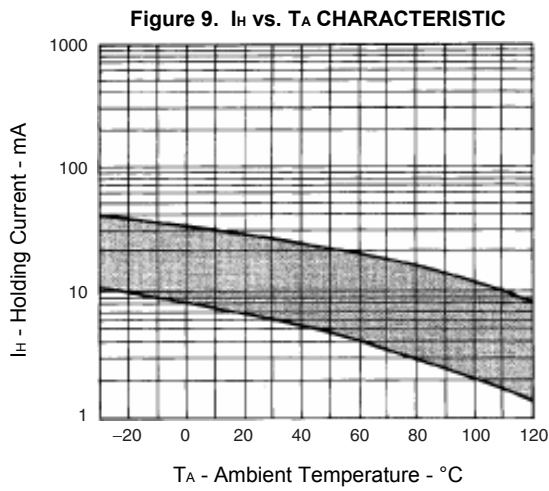
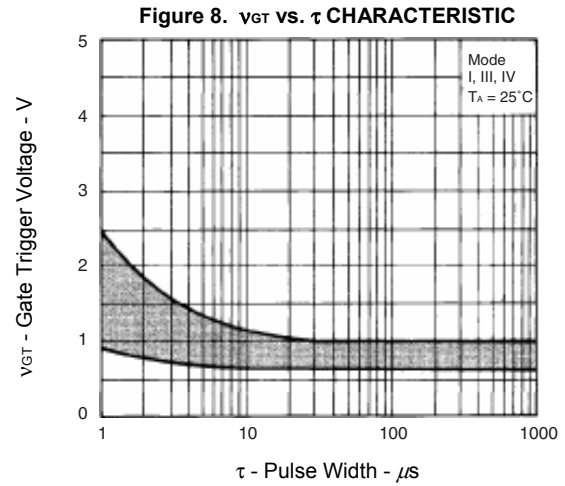
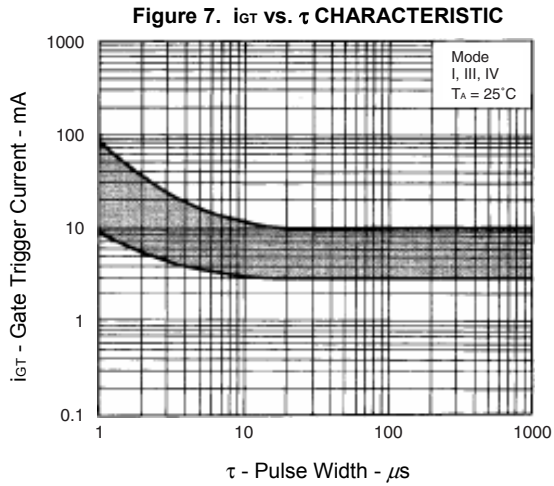
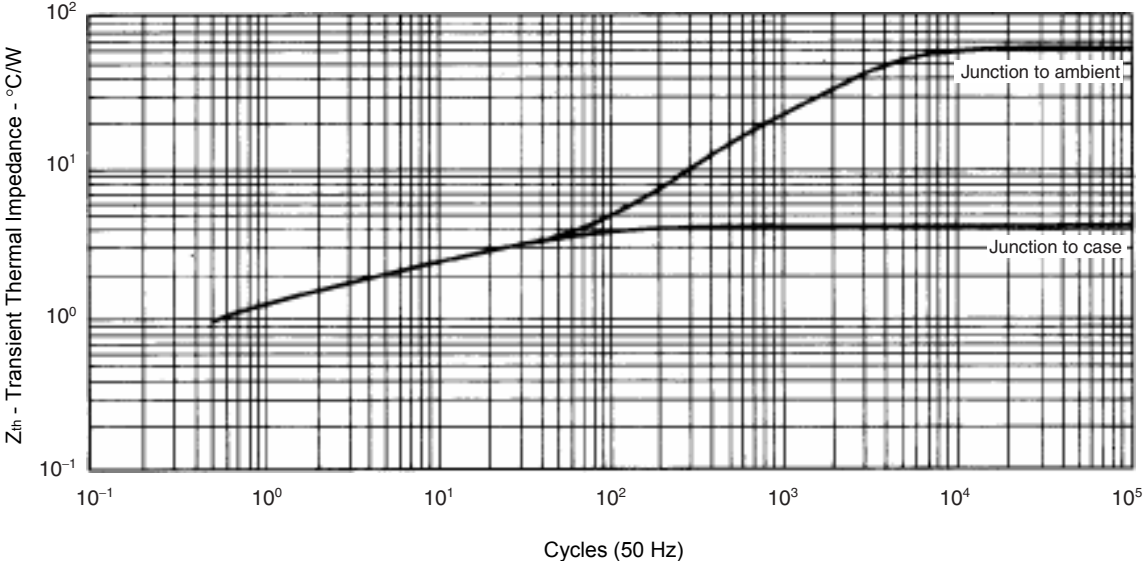


Figure 13. Z_{th} CHARACTERISTIC



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