

300 mA HIGH-WITHSTANDING-VOLTAGE MOLD SCR

DESCRIPTION

The 03P4MG and 03P6MG are P-gate fully diffused mold SCRs with an average on-state current of 300 mA. The repeat peak off-state voltages (and reverse voltages) are 400 and 600 V.

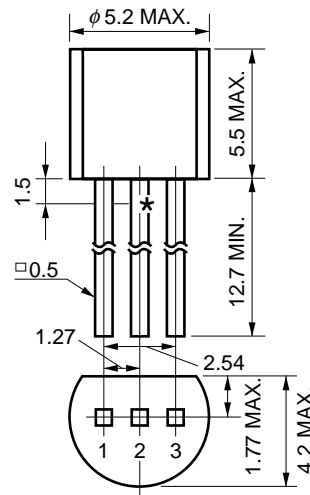
FEATURES

- 400 and 600 V high-withstanding-voltage series of products
- The non-repetitive withstanding voltage is a high 700 V, making it easy to harmonize the rise voltage of the surge absorber.
- High-sensitivity thyristor ($I_{GT} = 3$ to $50 \mu A$)
- Employs flame-retardant epoxy resin (UL94V-0)

APPLICATIONS

Leakage breakers, SSRs, various type of alarms, consumer electronic equipments and automobile electronic components

PACKAGE DRAWING (Unit: mm)



Electrode connection
1: Gate
2: Anode
3: Cathode

* T_c test bench-mark
Standard weight: 0.3 g

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$)

| Parameter | Symbol | Ratings | | Unit | Remarks |
|---|---------------|---|--------|------------|------------------------------|
| | | 03P4MG | 03P6MG | | |
| Non-repetitive Peak Reverse Voltage | V_{RSM} | 700 | 700 | V | $R_{GK} = 1 \text{ k}\Omega$ |
| Non-repetitive Peak Off-state Voltage | V_{DSM} | 700 | 700 | V | $R_{GK} = 1 \text{ k}\Omega$ |
| Repetitive Peak Reverse Voltage | V_{RRM} | 400 | 600 | V | $R_{GK} = 1 \text{ k}\Omega$ |
| Repetitive Peak Off-state Voltage | V_{DRM} | 400 | 600 | V | $R_{GK} = 1 \text{ k}\Omega$ |
| Average On-state Current | $I_{T(AV)}$ | 300 ($T_A = 30^\circ C$, Single half-wave, $\theta = 180^\circ$) | | mA | Refer to Figure 10. |
| Effective On-state Current | $I_{T(RMS)}$ | 470 | | mA | — |
| ★ Surge On-state Current | I_{TSM} | 8 ($f = 50 \text{ Hz}$, Sine half-wave, 1 cycle) | | A | Refer to Figure 2. |
| Fusing Current | $\int i^2 dt$ | 0.15 ($1 \text{ ms} \leq t \leq 10 \text{ ms}$) | | $A^2 s$ | — |
| Critical Rate of On-state Current of Rise | di_T/dt | 20 | | $A/\mu s$ | — |
| Peak Gate Power Dissipation | P_{GM} | 100 ($f \geq 50 \text{ Hz}$, Duty $\leq 10\%$) | | mW | Refer to Figure 3. |
| Average Gate Power Dissipation | $P_{G(AV)}$ | 10 | | mW | Refer to Figure 3. |
| Peak Gate Forward Current | I_{FGM} | 100 ($f \geq 50 \text{ Hz}$, Duty $\leq 10\%$) | | mA | — |
| Peak Gate Reverse Voltage | V_{RGM} | 6 | | V | — |
| Junction Temperature | T_j | -40 to +125 | | $^\circ C$ | — |
| Storage Temperature | T_{stg} | -55 to +150 | | $^\circ C$ | — |

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ELECTRICAL CHARACTERISTICS (T_j = 25°C, R_{θK} = 1 kΩ)

| Parameter | Symbol | Conditions | Specifications | | | Unit | Remarks | |
|--|----------------------|---|------------------------|------|------|------|---------------------|---|
| | | | MIN. | TYP. | MAX. | | | |
| Non-repetitive Peak Reverse Current | I _{RRM} | V _{RM} = V _{RDM} | T _j = 25°C | - | - | 10 | μA | - |
| | | | T _j = 125°C | - | - | 100 | μA | - |
| Non-repetitive Peak Off-state Current | I _{DRM} | V _{DM} = V _{DRM} | T _j = 25°C | - | - | 10 | μA | - |
| | | | T _j = 125°C | - | - | 100 | μA | - |
| Critical Rate-of-rise of Off-state Voltage | dV _D /dt | T _j = 125°C, V _{DM} = $\frac{2}{3}$ V _{DRM} | 10 | - | - | V/μs | - | |
| On-state Voltage | V _T | I _T = 4 A | - | - | 2.2 | V | Refer to Figure 1. | |
| Gate Trigger Current | I _{GT} | V _{DM} = 6 V, R _L = 100 Ω | 3 | - | 50 | μA | - | |
| Gate Trigger Voltage | V _{GT} | V _{DM} = 6 V, R _L = 100 Ω | - | - | 0.8 | V | - | |
| Gate Non-trigger Voltage | V _{GD} | T _j = 125°C, V _{DM} = $\frac{V_{DRM}}{2}$ | 0.2 | - | - | V | - | |
| Holding Current | I _H | V _{DM} = 24 V, I _{TM} = 4 A | - | - | 5 | mA | - | |
| Turn-off Time | t _q | T _j = 125°C, I _T = 200 mA, dI _R /dt = 15 A/μs, V _R ≥ 25 V, V _{DM} = $\frac{2}{3}$ V _{DRM} , dV _D /dt = 10 V/μs | - | 60 | - | μs | - | |
| Thermal Resistance | R _{th(j-c)} | Junction-to-case DC | - | - | 50 | °C/W | Refer to Figure 14. | |
| | R _{th(j-a)} | Junction-to-ambient DC | - | - | 230 | °C/W | Refer to Figure 14. | |

TYPICAL CHARACTERISTICS (T_A = 25°C)

Figure 1. i_r vs. v_T Characteristics

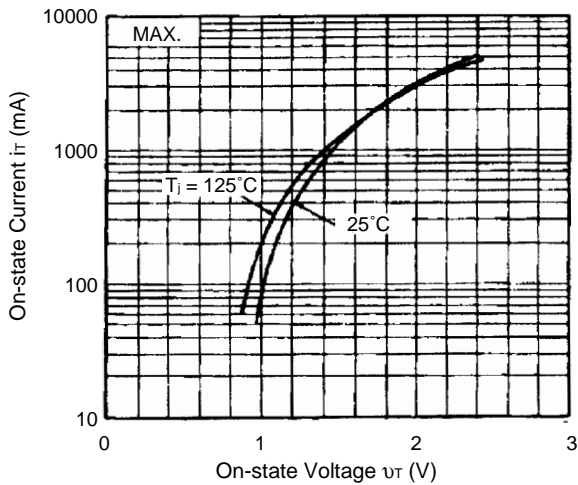


Figure 2. I_{rSM} Rating

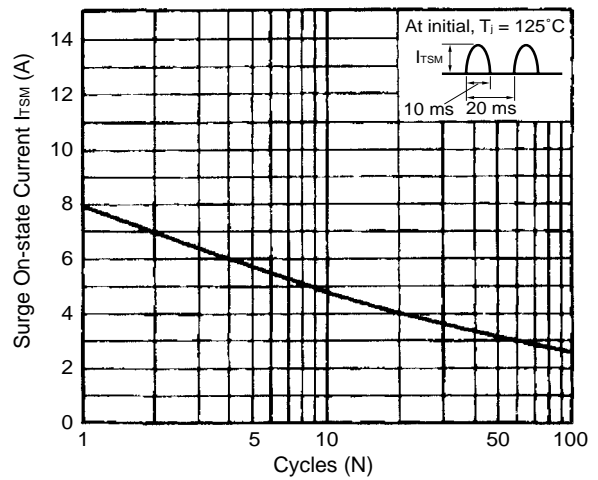


Figure 3. Gate Rating

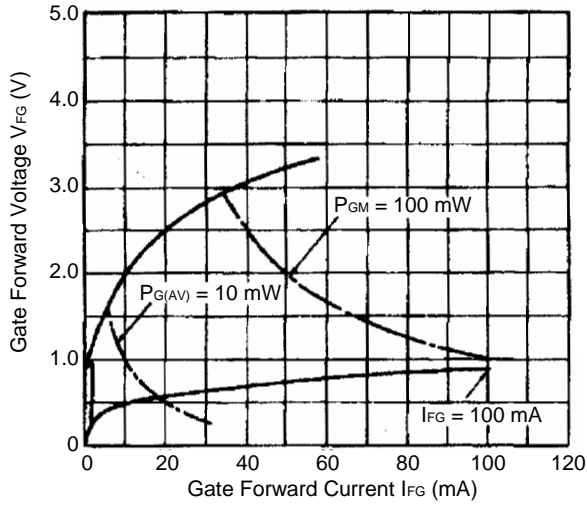


Figure 4. Example of Gate Characteristics

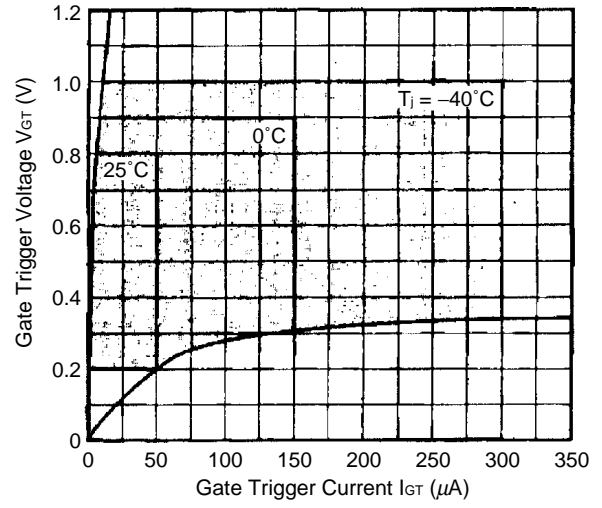


Figure 5. IGT vs. TA Example of Characteristics

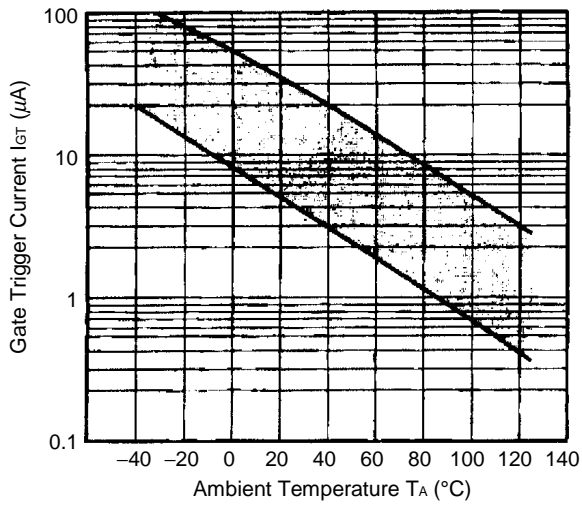


Figure 6. VGT vs. TA Example of Characteristics

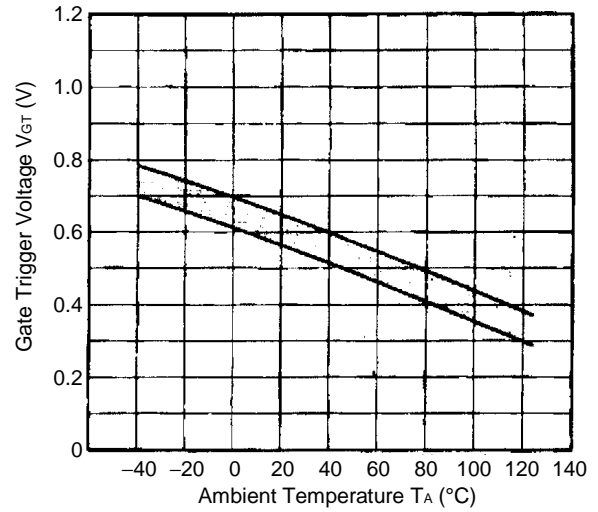


Figure 7. IGS vs. τ Example of Characteristics

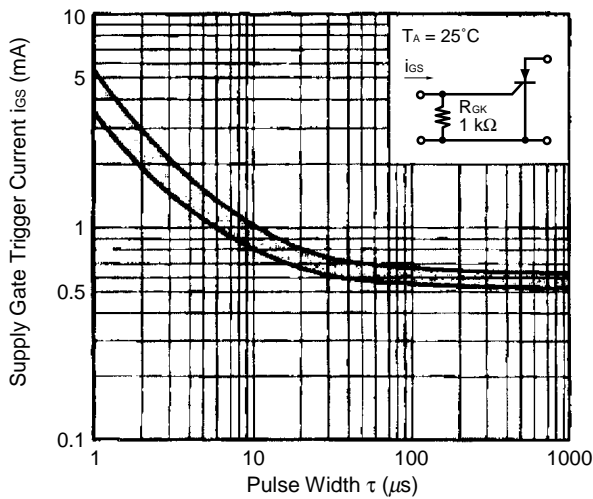


Figure 8. VGT vs. τ Example of Characteristics

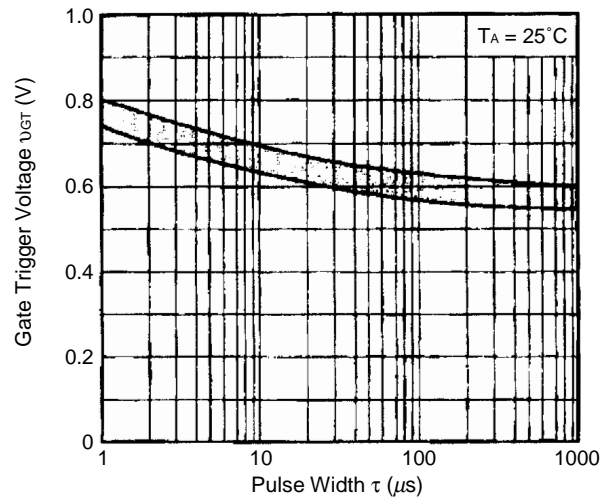


Figure 9. $P_{T(AV)}$ vs. $I_{T(AV)}$ Characteristics

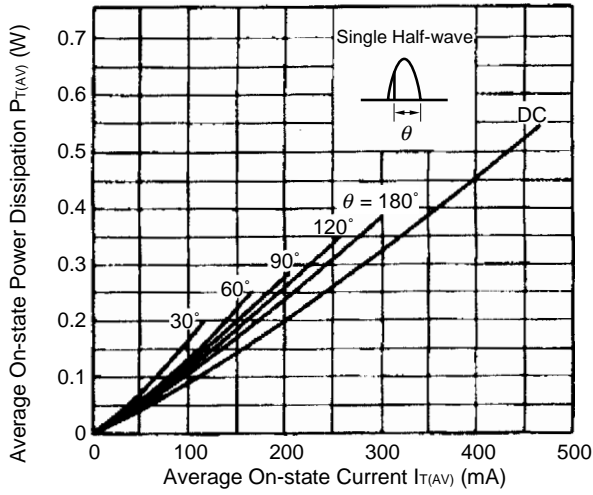


Figure 10. T_A vs. $I_{T(AV)}$ Characteristics

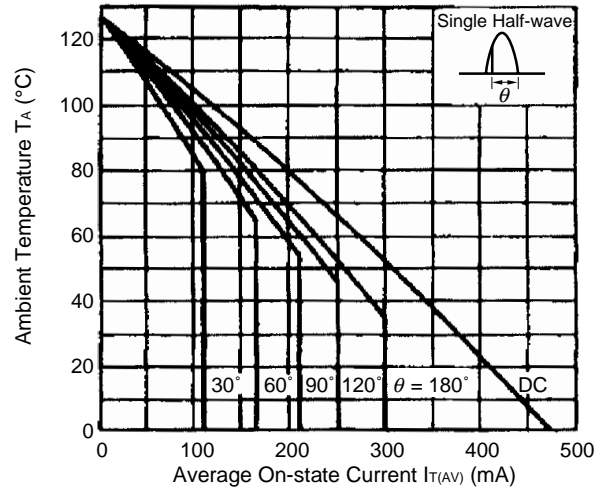


Figure 11. $P_{T(AV)}$ vs. $I_{T(AV)}$ Characteristics

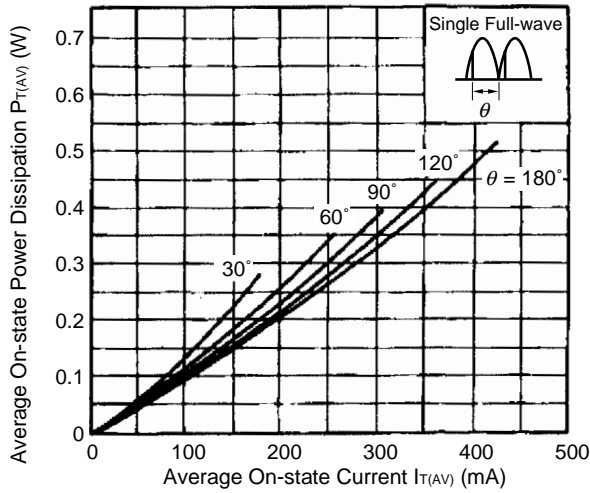


Figure 12. T_A vs. $I_{T(AV)}$ Characteristics

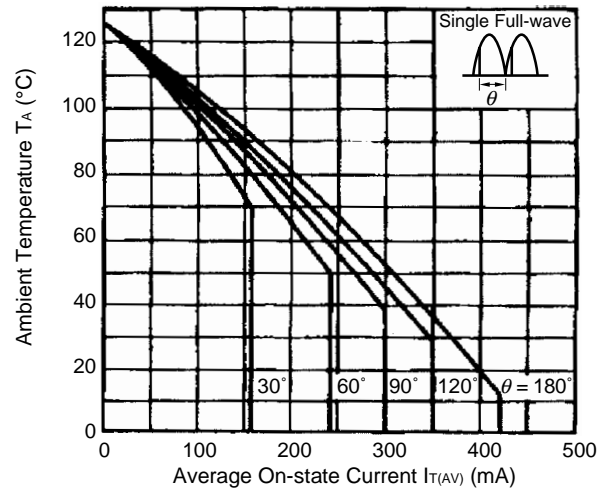


Figure 13. I_H vs. T_A Example of Characteristics

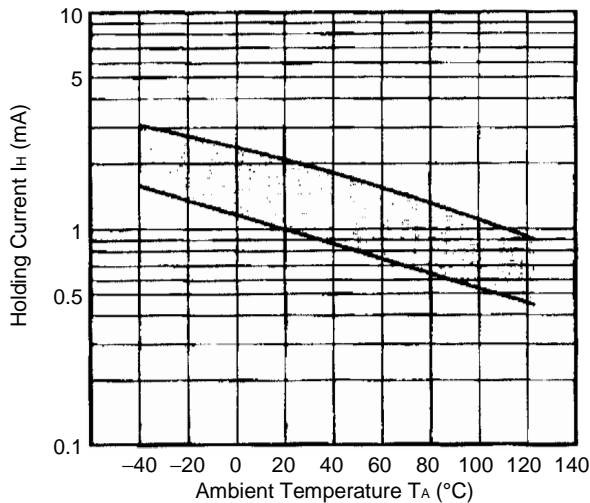
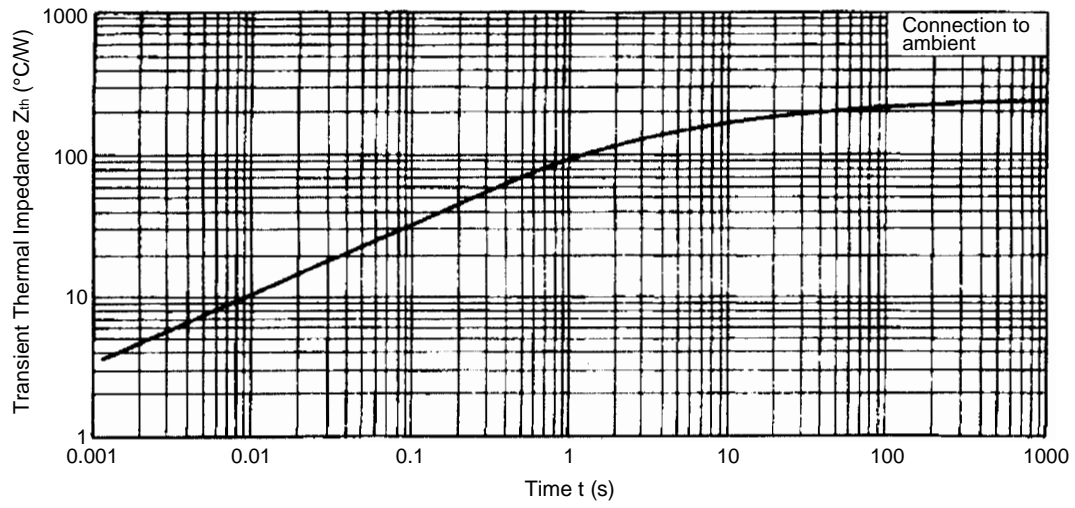


Figure 14. Z_{th} Characteristics



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