

Sensitive Gate Silicon Controlled Rectifiers

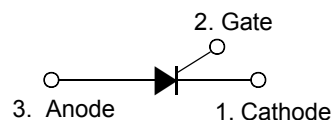
Features

- ◆ Repetitive Peak Off-State Voltage : 600V
- ◆ R.M.S On-State Current ($I_{T(RMS)} = 0.8 \text{ A}$)
- ◆ Low On-State Voltage (1.2V(Typ.)@ I_{TM})

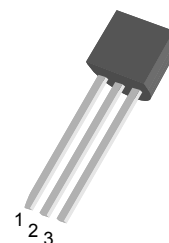
General Description

Sensitive triggering SCR is suitable for the application where gate current limited such as small motor control, gate driver for large SCR, sensing and detecting circuits.

Symbol



TO-92



Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Condition | Ratings | Units |
|--------------|--|--|------------|----------------------|
| V_{DRM} | Repetitive Peak Off-State Voltage | | 600 | V |
| $I_{T(AV)}$ | Average On-State Current | Half Sine Wave : $T_C = 74^\circ\text{C}$ | 0.5 | A |
| $I_{T(RMS)}$ | R.M.S On-State Current | All Conduction Angle | 0.8 | A |
| I_{TSM} | Surge On-State Current | 1/2 Cycle, 60Hz, Sine Wave Non-Replicative | 10 | A |
| I^2t | I^2t for Fusing | $t = 8.3\text{ms}$ | 0.415 | A^2s |
| P_{GM} | Forward Peak Gate Power Dissipation | $T_A = 25^\circ\text{C}$, Pulse Width $\leq 1.0\mu\text{s}$ | 2 | W |
| $P_{G(AV)}$ | Forward Average Gate Power Dissipation | $T_A = 25^\circ\text{C}$, $t = 8.3\text{ms}$ | 0.1 | W |
| I_{FGM} | Forward Peak Gate Current | | 1 | A |
| V_{RGM} | Reverse Peak Gate Voltage | | 5.0 | V |
| T_J | Operating Junction Temperature | | - 40 ~ 125 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature | | - 40 ~ 150 | $^\circ\text{C}$ |

MCR100-8

Electrical Characteristics ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)

| Symbol | Items | Conditions | Ratings | | | Unit |
|---------------|---|---|---------|--------|------------|---------------------------|
| | | | Min. | Typ. | Max. | |
| I_{DRM} | Repetitive Peak Off-State Current | $V_{AK} = V_{DRM}$ or V_{RRM} ; $R_{GK} = 1000\ \Omega$ $T_C = 25\text{ }^\circ\text{C}$ $T_C = 125\text{ }^\circ\text{C}$ | — — | — — | 10 200 | μA |
| V_{TM} | Peak On-State Voltage (1) | ($I_{TM} = 1\ \text{A}$, Peak) | — | 1.2 | 1.7 | V |
| I_{GT} | Gate Trigger Current (2) | $V_{AK} = 6\ \text{V}$, $R_L = 100\ \Omega$ $T_C = 25\text{ }^\circ\text{C}$ $T_C = -40\text{ }^\circ\text{C}$ | — — | — — | 200 500 | μA |
| V_{GT} | Gate Trigger Voltage (2) | $V_D = 7\ \text{V}$, $R_L = 100\ \Omega$ $T_C = 25\text{ }^\circ\text{C}$ $T_C = -40\text{ }^\circ\text{C}$ | — — | — — | 0.8 1.2 | V |
| V_{GD} | Non-Trigger Gate Voltage (1) | $V_{AK} = 12\ \text{V}$, $R_L = 100\ \Omega$ $T_C = 125\text{ }^\circ\text{C}$ | 0.2 | — | — | V |
| dv/dt | Critical Rate of Rise Off-State Voltage | $V_D = 0.67\ V_{DRM}$, Exponential waveform, $R_{GK} = 1000\ \Omega$ $T_J = 125\text{ }^\circ\text{C}$ | 500 | 800 | — | $\text{V}/\mu\text{s}$ |
| di/dt | Critical Rate of Rise On-State Current | $I_{TM} = 2\ \text{A}$; $I_g = 10\ \text{mA}$ | — | — | 50 | $\text{A}/\mu\text{s}$ |
| I_H | Holding Current | $V_{AK} = 12\ \text{V}$, Gate Open Initiating Current = 50mA $T_C = 25\text{ }^\circ\text{C}$ $T_C = -40\text{ }^\circ\text{C}$ | — — | 2 — | 5.0 10 | mA |
| $R_{th(j-c)}$ | Thermal Impedance | Junction to case | — | — | 60 | $^\circ\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | Thermal Impedance | Junction to Ambient | — | — | 150 | $^\circ\text{C}/\text{W}$ |

※ Notes :

1. Pulse Width $\leq 1.0\ \text{ms}$, Duty cycle $\leq 1\%$
2. Does not include R_{GK} in measurement.



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Fig 1. Gate Characteristics

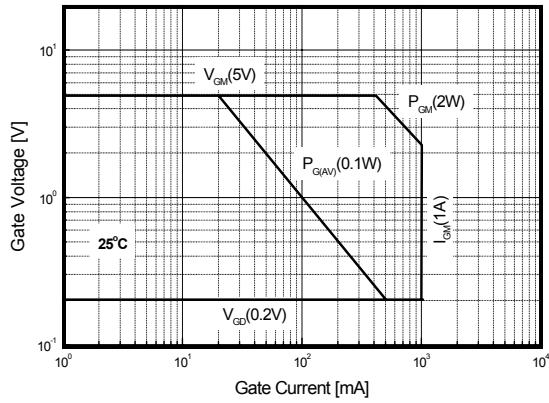


Fig 2. Maximum Case Temperature

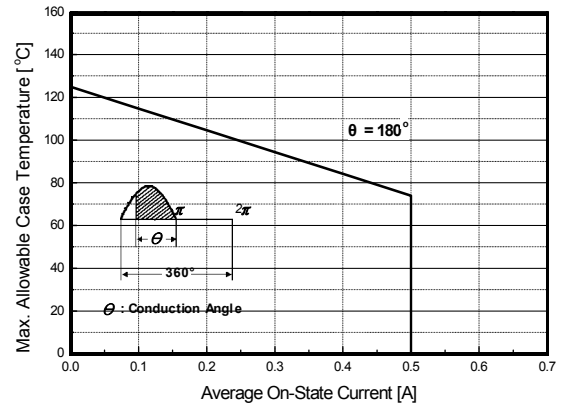


Fig 3. Typical Forward Voltage

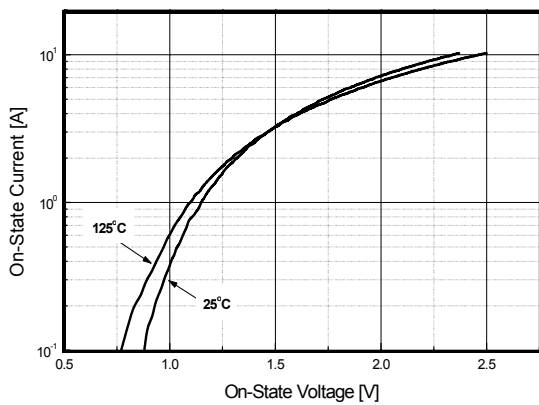


Fig 4. Thermal Response

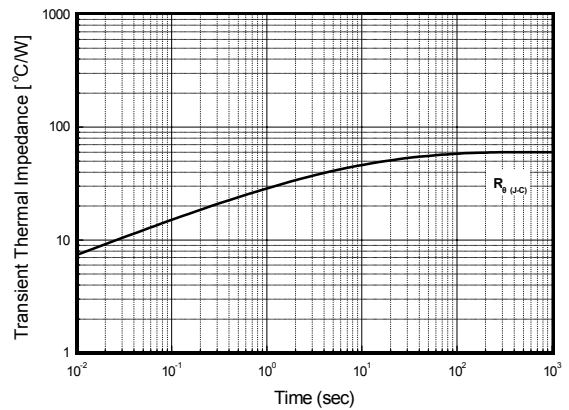


Fig 5. Typical Gate Trigger Voltage vs. Junction Temperature

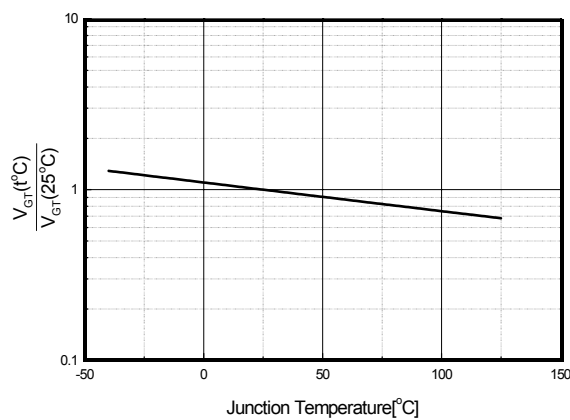
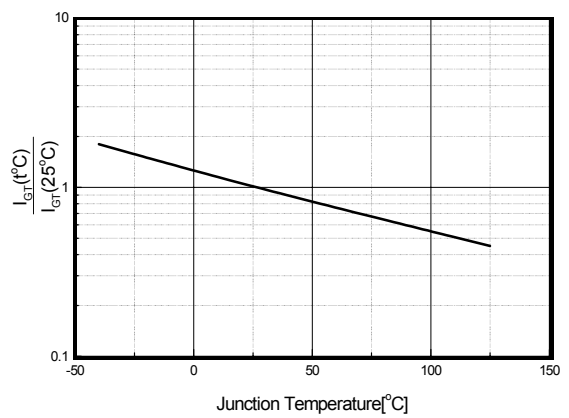


Fig 6. Typical Gate Trigger Current vs. Junction Temperature



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Fig 7. Typical Holding Current

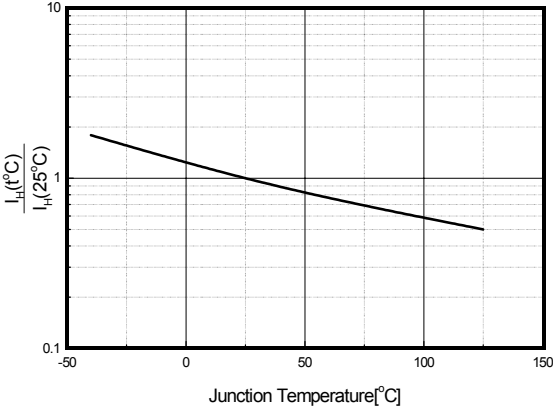
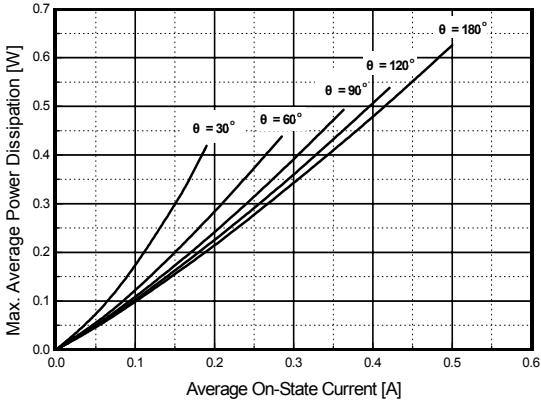


Fig 8. Power Dissipation



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TO-92 Package Dimension

| Dim. | mm | | | Inch | | |
|------|-------|------|-------|-------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | 4.2 | | | 0.165 | |
| B | | | 3.7 | | | 0.146 |
| C | 4.43 | | 4.83 | 0.174 | | 0.190 |
| D | 14.07 | | 14.87 | 0.554 | | 0.585 |
| E | | | 0.4 | | | 0.016 |
| F | 4.43 | | 4.83 | 0.174 | | 0.190 |
| G | | | 0.45 | | | 0.017 |
| H | | 2.54 | | | 0.100 | |
| I | | 2.54 | | | 0.100 | |
| J | 0.33 | | 0.48 | 0.013 | | 0.019 |

