Silicon Controlled Rectifiers Reverse Blocking Triode Thyristors

PNPN devices designed for high volume, line-powered consumer applications such as relay and lamp drivers, small motor controls, gate drivers for larger thyristors, and sensing and detection circuits. Supplied in an inexpensive plastic TO-226AA package which is readily adaptable for use in automatic insertion equipment.

- Sensitive Gate Trigger Current 200 μA Maximum
- Low Reverse and Forward Blocking Current 100 μA Maximum, T_C = 125°C
- Low Holding Current 5 mA Maximum
- Glass-Passivated Surface for Reliability and Uniformity



*Motorola preferred devices

SCRs 0.8 AMPERE RMS 100 thru 600 VOLTS





MAXIMUM RATINGS ($T_J = 25^{\circ}C$ unless otherwise noted.)

| Rating | Symbol | Value | Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------|------------------|
| Peak Repetitive Forward and Reverse Blocking Voltage(1) ($T_J = 25$ to 125° C, $R_{GK} = 1 \text{ k}\Omega$ MCR100-3 MCR100-4 MCR100-6 MCR100-8 | VDRM and ^V RRM | 100 200 400 600 | Volts |
| Forward Current RMS (See Figures 1 & 2) (All Conduction Angles) | IT(RMS) | 0.8 | Amps |
| Peak Forward Surge Current, T _A = 25°C (1/2 Cycle, Sine Wave, 60 Hz) | ITSM | 10 | Amps |
| Circuit Fusing Considerations (t = 8.3 ms) | l ² t | 0.415 | A ² s |
| Peak Gate Power — Forward, $T_A = 25^{\circ}C$ | PGM | 0.1 | Watts |
| Average Gate Power — Forward, $T_A = 25^{\circ}C$ | PGF(AV) | 0.01 | Watt |
| Peak Gate Current — Forward, T _A = 25°C (300 μs, 120 PPS) | ^I GFM | 1 | Amp |
| Peak Gate Voltage — Reverse | VGRM | 5 | Volts |
| Operating Junction Temperature Range @ Rated VRRM and VDRM | Тј | -40 to +125 | °C |
| Storage Temperature Range | T _{stg} | -40 to +150 | °C |
| Lead Solder Temperature (< 1/16" from case, 10 s max) | | +230 | °C |

1. VDRM and VRRM for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

Preferred devices are Motorola recommended choices for future use and best overall value.



THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|-----------------------------------------|------------------|-----|------|
| Thermal Resistance, Junction to Case | R _{θJC} | 75 | °C/W |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 200 | °C/W |

ELECTRICAL CHARACTERISTICS (T_C = 25°C, R_{GK} = 1 k Ω unless otherwise noted.)

| Characteristic | | Symbol | Min | Max | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------|---------------|-----------------|----------|
| Peak Forward or Reverse Blocking Current (V _{AK} = Rated V _{DRM} or V _{RRM}) | T _C = 25°C T _C = 125°C | IDRM, IRRM | = | 10 100 | μA μA |
| Forward "On" Voltage(1) (I _{TM} = 1 A Peak @ T _A = 25°C) | | V _{TM} | - | 1.7 | Volts |
| Gate Trigger Current (Continuous dc) ⁽²⁾ (Anode Voltage = 7 Vdc, R _L = 100 Ohms) | $T_C = 25^{\circ}C$ | IGT | — | 200 | μA |
| Gate Trigger Voltage (Continuous dc) (Anode Voltage = 7 Vdc, R _L = 100 Ohms) (Anode Voltage = Rated V _{DRM} , R _L = 100 Ohms) | $T_{C} = 25^{\circ}C$ $T_{C} = -40^{\circ}C$ $T_{C} = 125^{\circ}C$ | VGT | — — 0.1 | 0.8 1.2 — | Volts |
| Holding Current (Anode Voltage = 7 Vdc, initiating current = 20 mA) | $T_{C} = 25^{\circ}C$ $T_{C} = -40^{\circ}C$ | lΗ | — | 5 10 | mA |

1. Forward current applied for 1 ms maximum duration, duty cycle \leq 1%.

2. R_{GK} current is not included in measurement.



FIGURE 1 – MCR100-7, MCR100-8 CURRENT DERATING (REFERENCE: CASE TEMPERATURE)

FIGURE 2 – MCR100-7, MCR100-8 CURRENT DERATING (REFERENCE: AMBIENT TEMPERATURE)



PACKAGE DIMENSIONS



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