DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

# MC264-4-MC264-12

## SILICON CONTROLLED RECTIFIERS

**FEATURES:**

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number
- Available Non-RoHS (standard) or RoHS compliant (add PBF suffix)

**MAXIMUM RATINGS**

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| **Peak Repetitive Forward and Reverse Blocking Voltage** [1] ($T_J$ = 25 to 125°C, Gate Open) | MCR264-4<br>MCR264-6<br>MCR264-8<br>MCR264-10<br>MCR264-12 | $V_{DRM}$<br>$V_{RRM}$ | 200<br>400<br>600<br>800<br>1000 | Volts |
| **Forward Current** ($T_C$ = 80°C)<br>(All Conduction Angles) | | $I_{T(RMS)}$<br>$I_{T(AV)}$ | 40<br>25 | Amps |
| **Peak Non-Repetitive Surge Current – 8.3ms**<br>(1/2 Cycle, Sine Wave) **1.5ms** | | $I_{TSM}$ | 400<br>450 | Amps |
| **Forward Peak Gate Power** | | $P_{GM}$ | 20 | Watts |
| **Forward Average Gate Power** | | $P_{G(AV)}$ | 0.5 | Watt |
| **Forward Peak Gate Current**<br>(300µs, 120PPS) | | $I_{GM}$ | 2 | Amps |
| **Operating Junction Temperature Range** | | $T_J$ | -40 to +125 | °C |
| **Storage Temperature Range** | | $T_{stg}$ | -40 to +150 | °C |
| **Thermal Resistance, Junction to Case** | | $R_{\theta JC}$ | 1 | °C/W |
| **Thermal Resistance, Junction to Ambient** | | $R_{\theta JA}$ | 60 | °C/W |

Note 1: $V_{DRM}$ and $V_{RRM}$ 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.
These devices are rated for use in applications subject to high surge conditions. Care must be taken to ensure proper heat sinking when the device is to be used at high sustained currents.

**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise specified)

| Characteristics | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Peak Forward or Reverse Blocking Current**<br>($V_{AK}$ = Rated $V_{DRM}$ or $V_{RRM}$, Gate Open) | $T_J$ = 25°C<br>$T_J$ = 125°C | $I_{DRM}$, $I_{RRM}$ | -<br>- | -<br>- | 10<br>2 | µA<br>mA |
| **Forward "On" Voltage** [2]<br>($I_{TM}$ = 80A) | | $V_{TM}$ | - | 1.4 | 2 | Volts |
| **Gate Trigger Current** (Continuous dc)<br>(Anode Voltage = 12 Vdc, $R_L$ = 100 Ohms, $T_C$ = -40°C) | | $I_{GT}$ | -<br>- | 15<br>30 | 50<br>90 | mA |
| **Gate Trigger Voltage** (Continuous dc)<br>(Anode Voltage = 12 Vdc, $R_L$ = 100 Ohms) | | $V_{GT}$ | - | 1 | 1.5 | Volts |
| **Gate Non-Trigger Voltage**<br>(Anode Voltage = Rated $V_{DRM}$, $R_L$ = 100 Ohms, $T_J$ = 125°C) | | $V_{GD}$ | 0.2 | - | - | Volts |
| **Holding Current**<br>(Anode Voltage = 12 Vdc) | | $I_H$ | - | 30 | 60 | mA |
| **Turn-On Time**<br>($I_{TM}$ = 40 A, $I_{GT}$ = 60 mAdc) | | $t_{gt}$ | - | 1.5 | - | µs |
| **Critical Rate-of-Rise of Off-State Voltage**<br>(Gate Open, $V_D$ = Rated $V_{DRM}$, Exponential Waveform) | | dv/dt | - | 50 | - | V/µs |

Note 2: Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.

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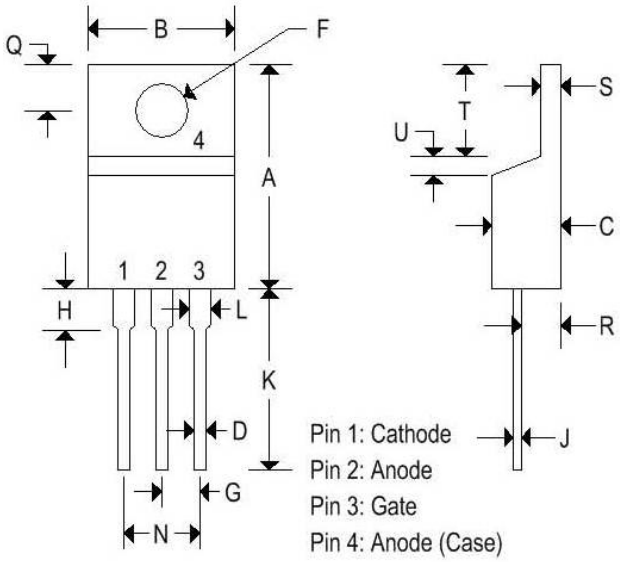
**MECHANICAL CHARACTERISTICS**

| | |
|---|---|
| **Case** | TO-220AB |
| **Marking** | Body painted, alpha-numeric |
| **Polarity** | Cathode band |




| | TO-220AB | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 0.575 | 0.620 | 14.600 | 15.750 |
| B | 0.380 | 0.405 | 9.650 | 10.290 |
| C | 0.160 | 0.190 | 4.060 | 4.820 |
| D | 0.025 | 0.035 | 0.640 | 0.890 |
| F | 0.142 | 0.147 | 3.610 | 3.730 |
| G | 0.095 | 0.105 | 2.410 | 2.670 |
| H | 0.110 | 0.155 | 2.790 | 3.930 |
| J | 0.014 | 0.022 | 0.360 | 0.560 |
| K | 0.500 | 0.562 | 12.700 | 14.270 |
| L | 0.045 | 0.055 | 1.140 | 1.390 |
| N | 0.190 | 0.210 | 4.830 | 5.330 |
| Q | 0.100 | 0.120 | 2.540 | 3.040 |
| R | 0.080 | 0.110 | 2.040 | 2.790 |
| S | 0.045 | 0.055 | 1.140 | 1.390 |
| T | 0.235 | 0.255 | 5.970 | 6.480 |
| U | - | 0.050 | - | 1.270 |
| V | 0.045 | - | 1.140 | - |
| Z | - | 0.080 | - | 2.030 |

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## SILICON CONTROLLED RECTIFIERS

**FIGURE 3 — GATE TRIGGER CURRENT**

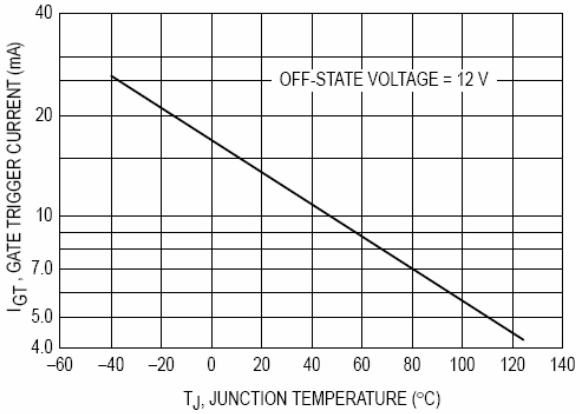


**FIGURE 4 — NEW GATE TRIGGER VOLTAGE**

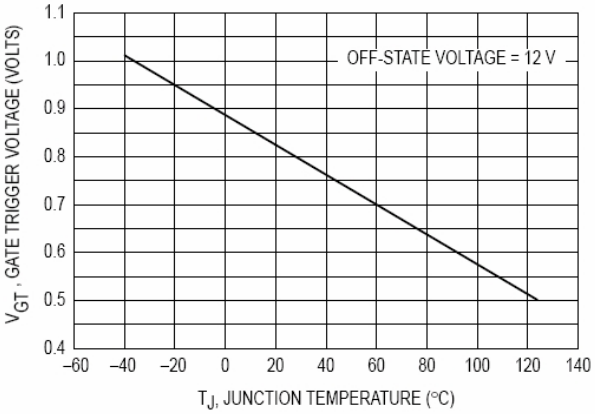


**FIGURE 5 — HOLDING CURRENT**

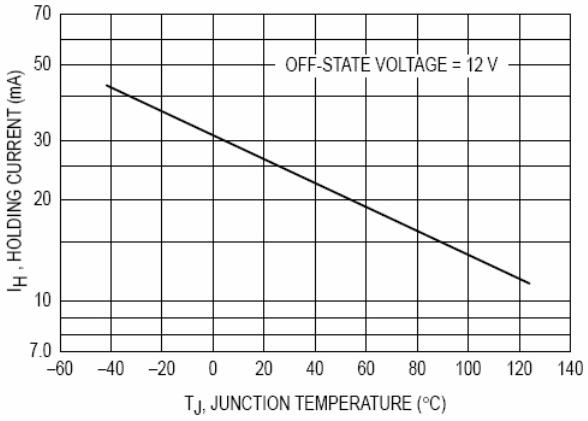


**FIGURE 6 — TYPICAL FORWARD VOLTAGE**

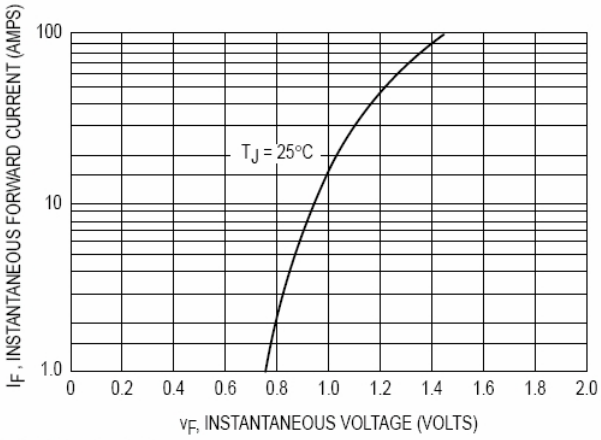


**FIGURE 7 — THERMAL RESPONSE**