

MCR100 Series

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

| Rating | Symbol | Value | Unit |
|--|--|--------------------------|------------------|
| Peak Repetitive Off-State Voltage (Notes 1 and 2) (T _J = -40 to 110°C, Sine Wave, 50 to 60 Hz; R _{GK} = 1 kΩ) | V _{DRM} , V _{RRM} | 100 200 400 600 | V |
| On-State RMS Current, (T _C = 80°C) 180° Conduction Angles | I _{T(RMS)} | 0.8 | A |
| Peak Non-Repetitive Surge Current, (1/2 Cycle, Sine Wave, 60 Hz, T _J = 25°C) | I _{TSM} | 10 | A |
| Circuit Fusing Consideration, (t = 8.3 ms) | I ² t | 0.415 | A ² s |
| Forward Peak Gate Power, (T _A = 25°C, Pulse Width ≤ 1.0 μs) | P _{GM} | 0.1 | W |
| Forward Average Gate Power, (T _A = 25°C, t = 8.3 ms) | P _{G(AV)} | 0.01 | W |
| Forward Peak Gate Current, (T _A = 25°C, Pulse Width ≤ 1.0 μs) | I _{GM} | 1.0 | A |
| Reverse Peak Gate Voltage, (T _A = 25°C, Pulse Width ≤ 1.0 μs) | V _{GRM} | 5.0 | V |
| Operating Junction Temperature Range @ Rate V _{RRM} and V _{DRM} | T _J | -40 to 110 | °C |
| Storage Temperature Range | T _{stg} | -40 to 150 | °C |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

- 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.
- See ordering information for exact device number options.

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|--------------------------------------|-----------|------|
| Thermal Resistance, Junction-to-Case Junction-to-Ambient | R _{θJC} R _{θJA} | 75 200 | °C/W |
| Lead Solder Temperature (< 1/16" from case, 10 secs max) | T _L | 260 | °C |

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|---|-------------------------------------|---|---|-----------|----|
| Peak Repetitive Forward or Reverse Blocking Current (Note 3) (V _D = Rated V _{DRM} and V _{RRM} ; R _{GK} = 1 kΩ) | I _{DRM} , I _{RRM} | - | - | 10 100 | μA |
| | | | | | |

ON CHARACTERISTICS

| | | | | | |
|--|-----------------|---|-----------|------------|----|
| Peak Forward On-State Voltage* (I _{TM} = 1.0 A Peak @ T _A = 25°C) | V _{TM} | - | - | 1.7 | V |
| Gate Trigger Current (Note 4) T _C = 25°C (V _{AK} = 7.0 Vdc, R _L = 100 Ω) | I _{GT} | - | 40 | 200 | μA |
| Holding Current (Note 3) T _C = 25°C (V _{AK} = 7.0 Vdc, Initiating Current = 20 mA, R _{GK} = 1 kΩ) T _C = -40°C | I _H | - | 0.5 - | 5.0 10 | mA |
| Latch Current (Note 4) T _C = 25°C (V _{AK} = 7.0 V, I _g = 200 μA) T _C = -40°C | I _L | - | 0.6 - | 10 15 | mA |
| Gate Trigger Voltage (Note 4) T _C = 25°C (V _{AK} = 7.0 Vdc, R _L = 100 Ω) T _C = -40°C | V _{GT} | - | 0.62 - | 0.8 1.2 | V |

DYNAMIC CHARACTERISTICS

| | | | | | |
|--|-------|----|----|----|------|
| Critical Rate of Rise of Off-State Voltage (V _D = Rated V _{DRM} , Exponential Waveform, R _{GK} = 1 kΩ, T _J = 110°C) | dV/dt | 20 | 35 | - | V/μs |
| Critical Rate of Rise of On-State Current (I _{PK} = 20 A; P _w = 10 μsec; diG/dt = 1 A/μsec, I _{gt} = 20 mA) | di/dt | - | - | 50 | A/μs |

*Indicates Pulse Test: Pulse Width ≤ 1.0 ms, Duty Cycle ≤ 1%.

3. R_{GK} = 1000 Ω included in measurement.

4. Does not include R_{GK} in measurement.

MCR100 Series

Voltage Current Characteristic of SCR

| Symbol | Parameter |
|-----------|---|
| V_{DRM} | Peak Repetitive Off State Forward Voltage |
| I_{DRM} | Peak Forward Blocking Current |
| V_{RRM} | Peak Repetitive Off State Reverse Voltage |
| I_{RRM} | Peak Reverse Blocking Current |
| V_{TM} | Peak on State Voltage |
| I_H | Holding Current |

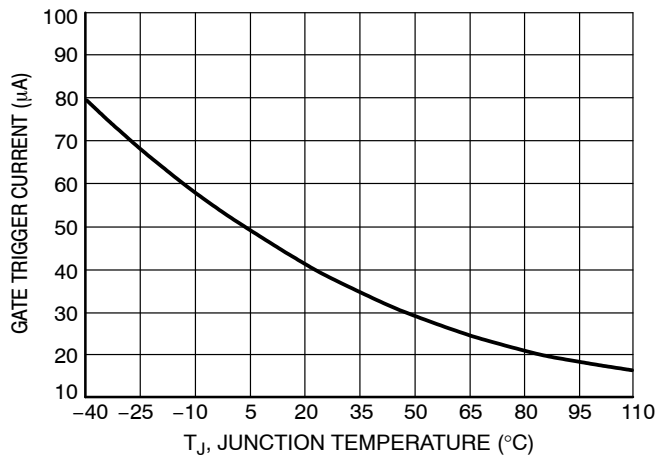
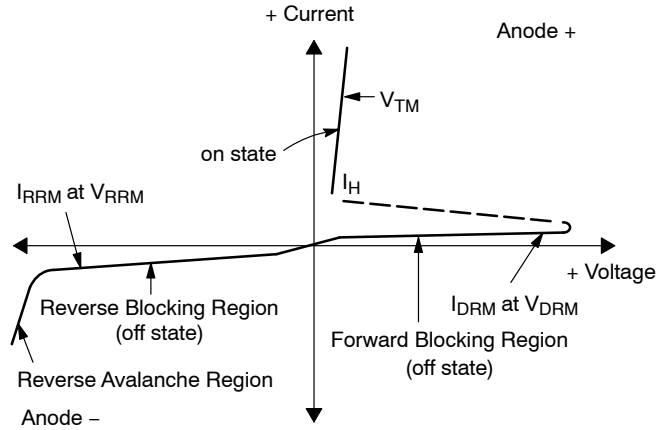


Figure 1. Typical Gate Trigger Current versus Junction Temperature

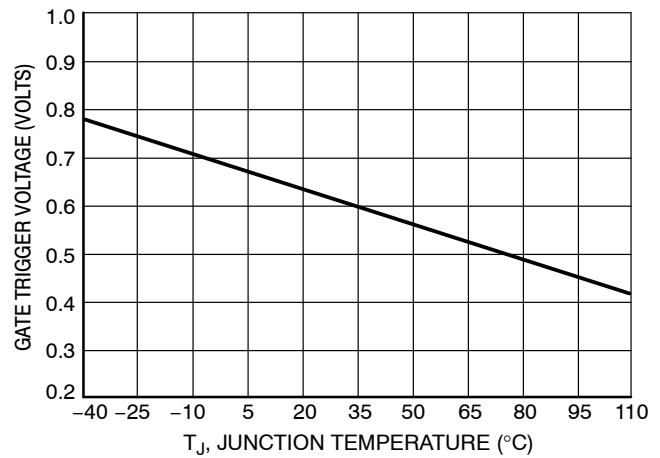


Figure 2. Typical Gate Trigger Voltage versus Junction Temperature

MCR100 Series

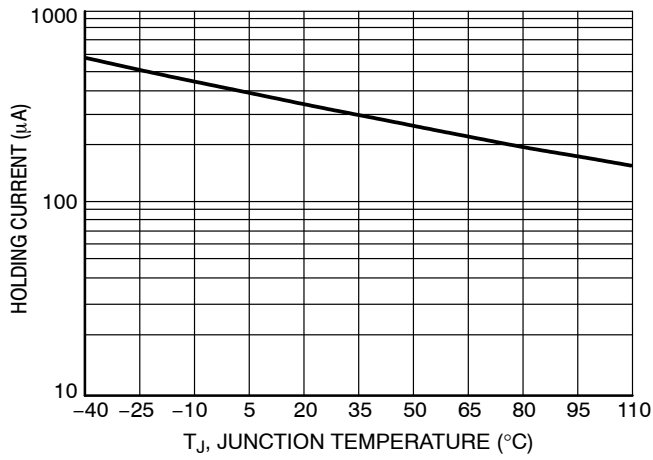


Figure 3. Typical Holding Current versus Junction Temperature

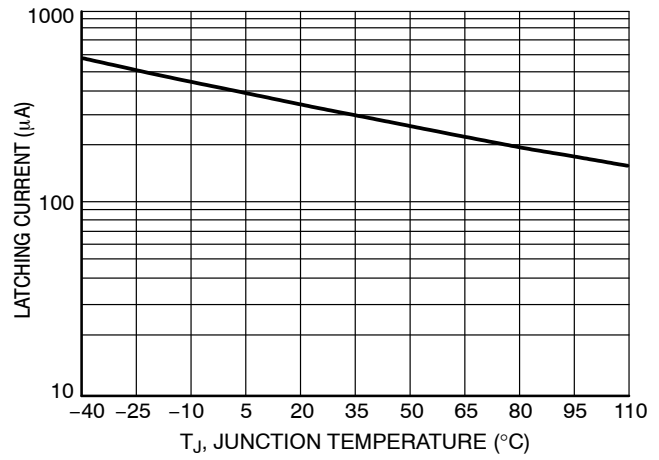


Figure 4. Typical Latching Current versus Junction Temperature

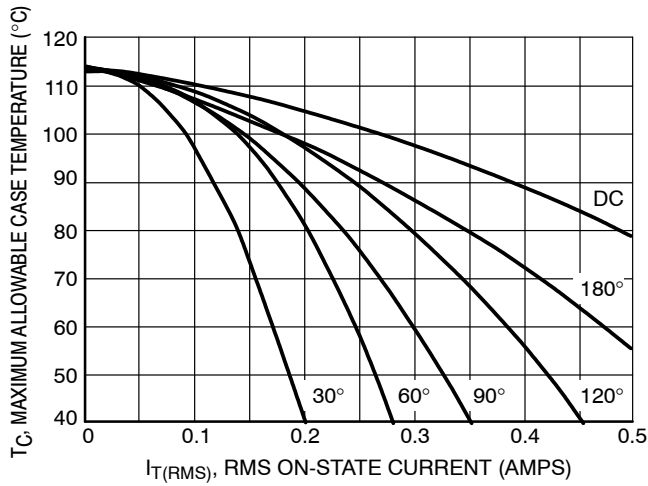


Figure 5. Typical RMS Current Derating

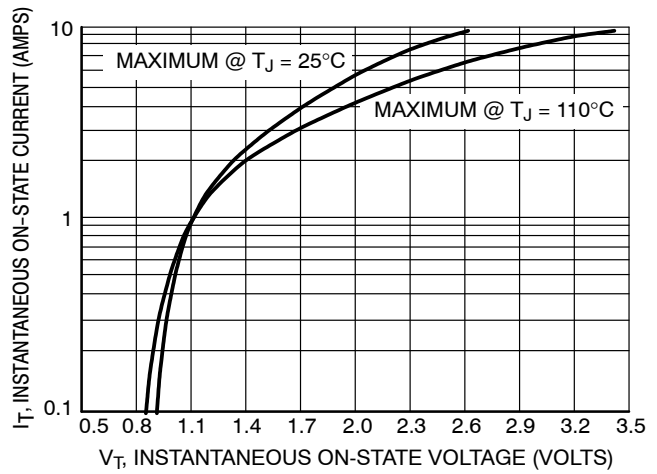


Figure 6. Typical On-State Characteristics

MCR100 Series

ORDERING INFORMATION

| Device | Package Code | Shipping† |
|---------------|-----------------------------|-------------------------|
| MCR100-003 | TO-92 (TO-226) | 5000 Units / Box |
| MCR100-004 | | |
| MCR100-006 | | |
| MCR100-008 | | |
| MCR100-3RL | | 2000 / Tape & Reel |
| MCR100-6RL | | |
| MCR100-6RLRA | | 2000 / Tape & Ammo Pack |
| MCR100-6RLRM | | |
| MCR100-6ZL1 | | 2000 / Tape & Reel |
| MCR100-8RL | | |
| MCR100-3G | TO-92 (TO-226) (Pb-Free) | 5000 Units / Box |
| MCR100-4G | | |
| MCR100-6G | | |
| MCR100-8G | | |
| MCR100-3RLG | | 2000 / Tape & Reel |
| MCR100-6RLG | | |
| MCR100-6RLRAG | | 2000 / Tape & Ammo Pack |
| MCR100-4RLRMG | | |
| MCR100-6RLRMG | | 2000 / Tape & Reel |
| MCR100-6ZL1G | | |
| MCR100-8RLG | | |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MCR100 Series

TO-92 EIA RADIAL TAPE IN BOX OR ON REEL

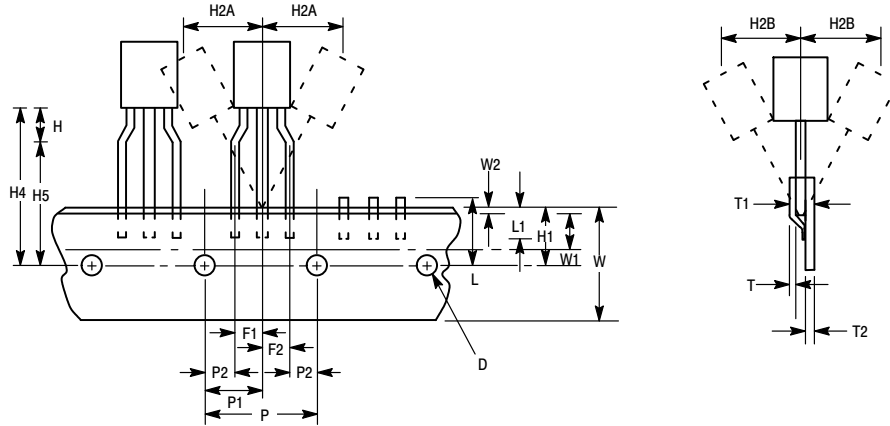


Figure 7. Device Positioning on Tape

| Symbol | Item | Specification | | | |
|--------|--------------------------------------|---------------|---------|------------|------|
| | | Inches | | Millimeter | |
| | | Min | Max | Min | Max |
| D | Tape Feedhole Diameter | 0.1496 | 0.1653 | 3.8 | 4.2 |
| D2 | Component Lead Thickness Dimension | 0.015 | 0.020 | 0.38 | 0.51 |
| F1, F2 | Component Lead Pitch | 0.0945 | 0.110 | 2.4 | 2.8 |
| H | Bottom of Component to Seating Plane | .059 | .156 | 1.5 | 4.0 |
| H1 | Feedhole Location | 0.3346 | 0.3741 | 8.5 | 9.5 |
| H2A | Deflection Left or Right | 0 | 0.039 | 0 | 1.0 |
| H2B | Deflection Front or Rear | 0 | 0.051 | 0 | 1.0 |
| H4 | Feedhole to Bottom of Component | 0.7086 | 0.768 | 18 | 19.5 |
| H5 | Feedhole to Seating Plane | 0.610 | 0.649 | 15.5 | 16.5 |
| L | Defective Unit Clipped Dimension | 0.3346 | 0.433 | 8.5 | 11 |
| L1 | Lead Wire Enclosure | 0.09842 | — | 2.5 | — |
| P | Feedhole Pitch | 0.4921 | 0.5079 | 12.5 | 12.9 |
| P1 | Feedhole Center to Center Lead | 0.2342 | 0.2658 | 5.95 | 6.75 |
| P2 | First Lead Spacing Dimension | 0.1397 | 0.1556 | 3.55 | 3.95 |
| T | Adhesive Tape Thickness | 0.06 | 0.08 | 0.15 | 0.20 |
| T1 | Overall Taped Package Thickness | — | 0.0567 | — | 1.44 |
| T2 | Carrier Strip Thickness | 0.014 | 0.027 | 0.35 | 0.65 |
| W | Carrier Strip Width | 0.6889 | 0.7481 | 17.5 | 19 |
| W1 | Adhesive Tape Width | 0.2165 | 0.2841 | 5.5 | 6.3 |
| W2 | Adhesive Tape Position | .0059 | 0.01968 | .15 | 0.5 |

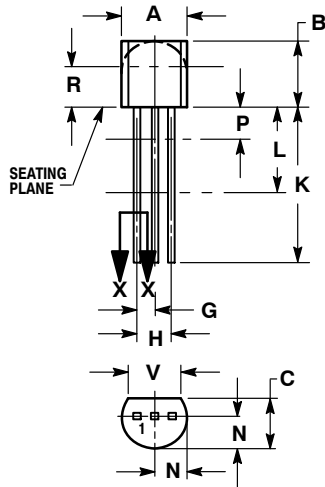
NOTES:

1. Maximum alignment deviation between leads not to be greater than 0.2 mm.
2. Defective components shall be clipped from the carrier tape such that the remaining protrusion (L) does not exceed a maximum of 11 mm.
3. Component lead to tape adhesion must meet the pull test requirements.
4. Maximum non-cumulative variation between tape feed holes shall not exceed 1 mm in 20 pitches.
5. Hold down tape not to extend beyond the edge(s) of carrier tape and there shall be no exposure of adhesive.
6. No more than 1 consecutive missing component is permitted.
7. A tape trailer and leader, having at least three feed holes is required before the first and after the last component.
8. Splices will not interfere with the sprocket feed holes.

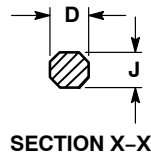
MCR100 Series

PACKAGE DIMENSIONS

TO-92 (TO-226) CASE 29-11 ISSUE AM



STRAIGHT LEAD
BULK PACK

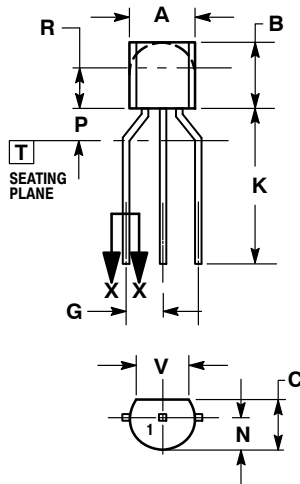


SECTION X-X

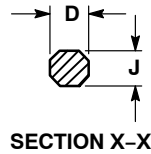
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.45 | 5.20 |
| B | 0.170 | 0.210 | 4.32 | 5.33 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.016 | 0.021 | 0.407 | 0.533 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.015 | 0.020 | 0.39 | 0.50 |
| K | 0.500 | --- | 12.70 | --- |
| L | 0.250 | --- | 6.35 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.115 | --- | 2.93 | --- |
| V | 0.135 | --- | 3.43 | --- |



BENT LEAD
TAPE & REEL
AMMO PACK



SECTION X-X


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | MIN | MAX |
| A | 4.45 | 5.20 |
| B | 4.32 | 5.33 |
| C | 3.18 | 4.19 |
| D | 0.40 | 0.54 |
| G | 2.40 | 2.80 |
| J | 0.39 | 0.50 |
| K | 12.70 | --- |
| N | 2.04 | 2.66 |
| P | 1.50 | 4.00 |
| R | 2.93 | --- |
| V | 3.43 | --- |

STYLE 10:

1. CATHODE
2. GATE
3. ANODE

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