

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit | |
|---|---------------------|-------------|----------------------|---|
| Peak repetitive off-state voltage⁽¹⁾ ($T_j = -40$ to $+110^\circ\text{C}$, sine wave, 50 to 60Hz, gate open) | | | | |
| MCR100-3 | | 100 | V | |
| MCR100-4 | V_{DRM} | 200 | | |
| MCR100-5 | V_{RRM} | 300 | | |
| MCR100-6 | | 400 | | |
| MCR100-7 | | 500 | | |
| MCR100-8 | | 600 | | |
| On-state RMS current (180° conduction angles, $T_c = 80^\circ\text{C}$) | $I_{\text{T(RMS)}}$ | 0.8 | | A |
| Peak non-repetitive surge current (half-cycle, sine wave, 60Hz, $T_j = 25^\circ\text{C}$) | I_{TSM} | 10 | | A |
| Circuit fusing consideration ($t = 8.3\text{ms}$) | I^2t | 0.415 | A^2s | |
| Forward peak gate power (pulse width $\leq 1.0\mu\text{s}$, $T_A = 25^\circ\text{C}$) | P_{GM} | 0.1 | W | |
| Forward average gate power ($t = 8.3\text{ms}$, $T_A = 25^\circ\text{C}$) | $P_{\text{G(AV)}}$ | 0.10 | W | |
| Forward peak gate current (pulse width $\leq 1.0\mu\text{s}$, $T_A = 25^\circ\text{C}$) | I_{GM} | 1.0 | A | |
| Reverse peak gate voltage (pulse width $\leq 1.0\mu\text{s}$, $T_A = 25^\circ\text{C}$) | V_{GRM} | 5.0 | V | |
| Operating junction temperature range @ rated V_{RRM} and V_{DRM} | T_j | -40 to +110 | $^\circ\text{C}$ | |
| Storage temperature range | T_{stg} | -40 to +150 | $^\circ\text{C}$ | |

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; 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.

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Maximum | Unit |
|---|-----------------------|---------|---------------------------|
| Thermal resistance, junction to case | $R_{\theta\text{JC}}$ | 75 | $^\circ\text{C}/\text{W}$ |
| Thermal resistance, junction to ambient | $R_{\theta\text{JA}}$ | 200 | $^\circ\text{C}/\text{W}$ |
| Lead solder temperature (lead length $< 1/16''$ from case, 10s max) | T_L | 260 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|------------------------|--------|-----------|------------|------------------|
| OFF CHARACTERISTICS | | | | | |
| Peak forward or reverse blocking current ⁽²⁾ ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}, R_{GK} = 1k\Omega$) $T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$ | I_{DRM} I_{RRM} | - - | - - | 10 100 | μA |
| ON CHARACTERISTICS | | | | | |
| Peak forward on-state voltage [*] ($I_{TM} = 1.0\text{A peak, @ } T_A = 25^\circ\text{C}$) | V_{TM} | - | - | 1.7 | V |
| Gate trigger current (continuous dc) ⁽³⁾ ($V_{AK} = 7\text{V}, R_L = 100\Omega, T_C = 25^\circ\text{C}$) | I_{GT} | - | 40 | 200 | μA |
| Holding current ⁽²⁾ ($V_{AK} = 7\text{V}$, initiating current = 20mA) $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$ | I_H | - - | 0.5 - | 5.0 10 | mA |
| Latch current ($V_{AK} = 7\text{V}, I_g = 200\mu\text{A}$) $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$ | I_L | - - | 0.6 - | 10 15 | mA |
| Gate trigger voltage (continuous dc) ⁽³⁾ ($V_{AK} = 7\text{V}, R_L = 100\Omega$) $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$ | V_{GT} | - - | 0.62 - | 0.8 1.2 | V |
| DYNAMIC CHARACTERISTICS | | | | | |
| Critical rate of rise of off-state voltage ($V_D = \text{rated } V_{DRM}$, exponential waveform, $R_{GK} = 1000\Omega, T_J = 110^\circ\text{C}$) | dv/dt | 20 | 35 | - | V/ μs |
| Critical rate of rise of on-state current ($I_{PK} = 20\text{A}, PW = 10\mu\text{sec}, di_G/dt = I_{gt} = 20\text{mA}$) | di/dt | - | - | 50 | A/ μs |

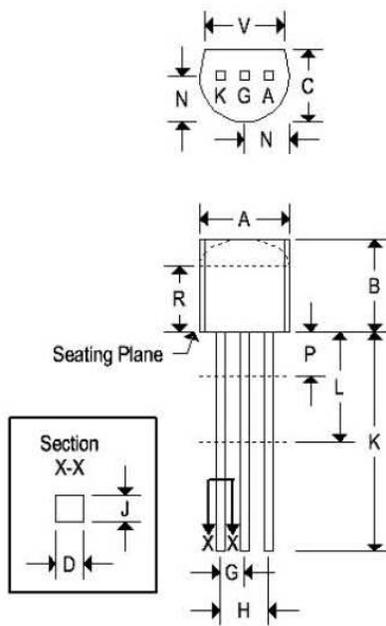
Note 2: $R_{GK} = 1000\Omega$ included in measurement.

Note 3: Does not include R_{GK} in measurement.

* Pulse test: pulse width $\leq 1.0\text{ms}$, duty cycle $\leq 1\%$.

MECHANICAL CHARACTERISTICS

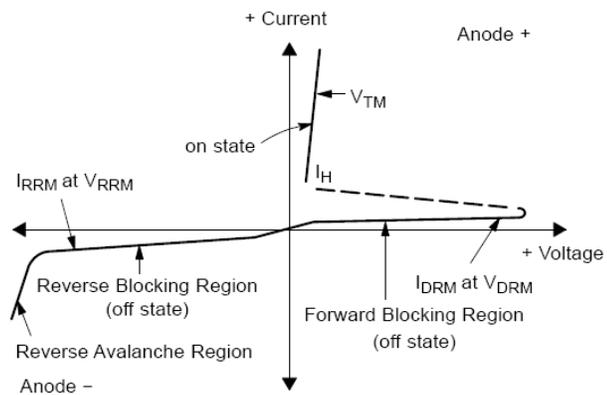
| | |
|----------|-----------------------------|
| Case: | TO-92 |
| Marking: | Body painted, alpha-numeric |
| Pin out: | See below |



| | TO-92 | | | |
|---|--------|-------|-------------|-------|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 0.175 | 0.205 | 4.450 | 5.200 |
| B | 0.170 | 0.210 | 4.320 | 5.330 |
| C | 0.125 | 0.165 | 3.180 | 4.190 |
| D | 0.016 | 0.022 | 0.410 | 0.550 |
| F | 0.016 | 0.019 | 0.410 | 0.480 |
| G | 0.045 | 0.055 | 1.150 | 1.390 |
| H | 0.095 | 0.105 | 2.420 | 2.660 |
| J | 0.015 | 0.020 | 0.390 | 0.500 |
| K | 0.500 | - | 12.700 | - |
| L | 0.250 | - | 6.350 | - |
| N | 0.080 | 0.105 | 2.040 | 2.660 |
| P | - | 0.100 | - | 2.540 |
| R | 0.115 | - | 2.930 | - |
| V | 0.135 | - | 3.430 | - |

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 |



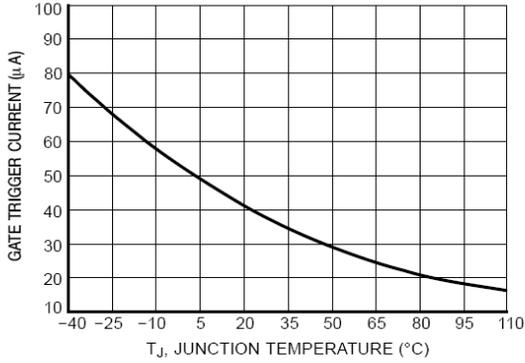


Figure 1. Typical Gate Trigger Current versus Junction Temperature

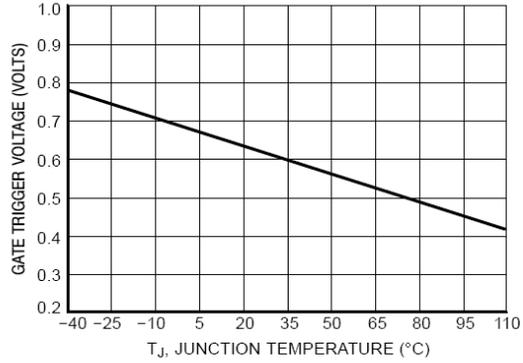


Figure 2. Typical Gate Trigger Voltage versus Junction Temperature

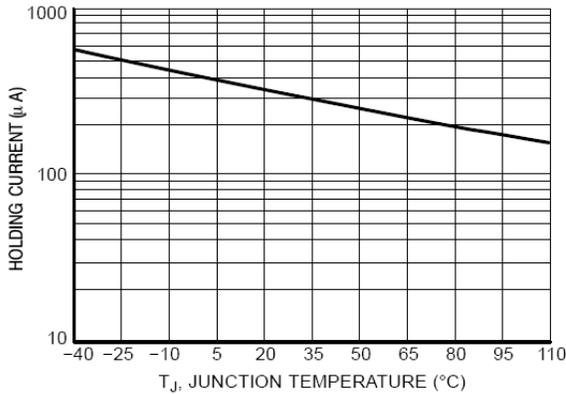


Figure 3. Typical Holding Current versus Junction Temperature

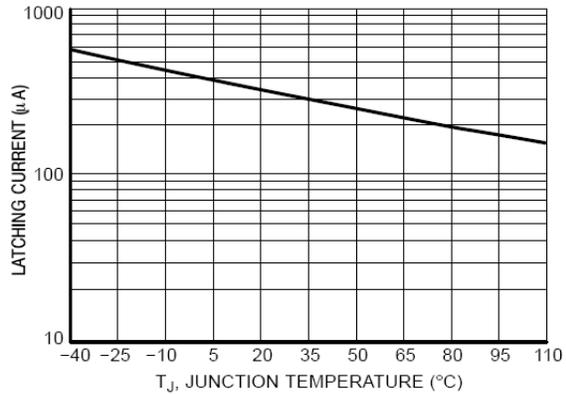


Figure 4. Typical Latching Current versus Junction Temperature

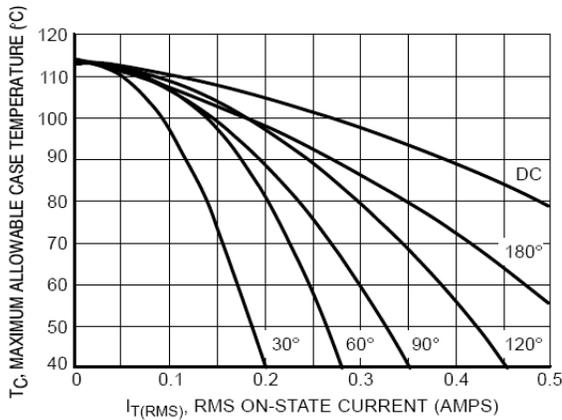


Figure 5. Typical RMS Current Derating

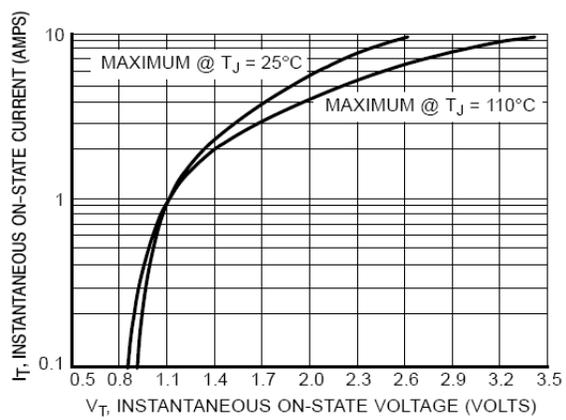


Figure 6. Typical On-State Characteristics