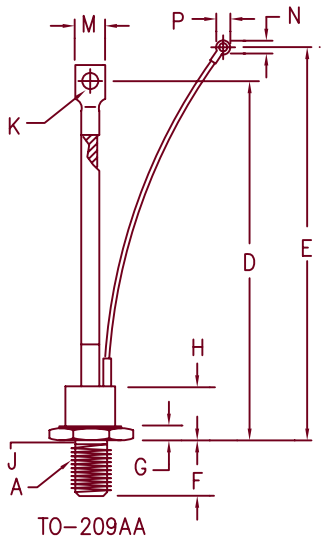
# Silicon Controlled Rectifiers
# 2N1909 — 2N1916




TO–209AA
(TO–94)

| Dim. | Inches | | Millimeter | | |
|---|---|---|---|---|---|
| | Minimum | Maximum | Minimum | Maximum | Notes |
| A | --- | --- | --- | --- | 1 |
| B | 1.050 | 1.060 | 26.67 | 26.92 | across flats |
| C | --- | 1.161 | --- | 29.49 | |
| D | 5.850 | 6.144 | 149.10 | 156.06 | |
| E | 6.850 | 7.375 | 173.99 | 187.33 | |
| F | .797 | .827 | 20.24 | 21.01 | |
| G | .276 | .286 | .701 | 7.26 | |
| H | --- | .948 | --- | 24.08 | |
| J | .425 | .499 | 10.80 | 12.67 | 2 |
| K | .260 | .280 | 6.60 | 7.11 | Dia. |
| M | .500 | .600 | 12.70 | 15.24 | |
| N | .140 | .150 | 3.56 | 3.81 | |
| P | --- | .295 | --- | 7.49 | |

Note 1: 1/2–20 UNF–3A
Note 2: Full thread within 2 1/2 threads

| Microsemi Catalog Number | Forward & Reverse Repetitive Blocking | Reverse Transient Blocking |
|---|---|---|
| 2N1909 | 25 | 25 |
| 2N1910 | 50 | 50 |
| 2N1911 | 100 | 100 |
| 2N1912 | 150 | 150 |
| 2N1913 | 200 | 200 |
| 2N1914 | 250 | 250 |
| 2N1915 | 300 | 300 |
| 2N1916 | 400 | 400 |

To specify dv/dt higher than 200V/usec., contact factory.

- High dv/dt–200 V/usec.
- 1600 Amperes surge current
- Low forward on–state voltage
- Package conforming to TO–209AA outline
- Economical for general purpose phase control applications

## Electrical Characteristics

| | | | |
|---|---|---|---|
| Max. RMS on–state current | $I_{T(RMS)}$ | 110 Amps | $T_C$ = 87°C |
| Max. average on–state cur. | $I_{T(AV)}$ | 70 Amps | $T_C$ = 87°C |
| Max. peak on–state voltage | $V_{TM}$ | 1.6 Volts | $I_{TM}$ = 220 A(peak) |
| Max. holding current | $I_H$ | 200 mA | |
| Max. peak one cycle surge current | $I_{TSM}$ | 1600 A | $T_C$ = 87°C, 60 Hz |
| Max. $I^2t$ capability for fusing | $I^2t$ | 10,624$A^2S$ | t = 8.3 ms |

## Thermal and Mechanical Characteristics

| | | |
|---|---|---|
| Operating junction temp range | $T_J$ | –65°C to 125°C |
| Storage temperature range | $T_{STG}$ | –65°C to 150°C |
| Maximum thermal resistance | $R_{\theta JC}$ | 0.40°C/W Junction to case |
| Typical thermal resistance (greased) | $R_{\theta CS}$ | 0.20°C/W Case to sink |
| Mounting torque | | 100–130 inch pounds |
| Weight | | 3.6 ounces (102.0 grams) typical |

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# 2N1909 – 2N1916

## Switching

| | | | |
|---|---|---|---|
| Critical rate of rise of on-state current (note 1) | di/dt | 100A/usec. | $T_J$ = 125°C |
| Typical delay time (note 1) | $t_d$ | 3.0 usec. | |
| Typical circuit commuted turn-off time (note 2) | $t_q$ | 100 usec. | $T_J$ = 125°C |

Note 1: $I_{TM}$ = 50A, $V_D$ = $V_{DRM}$. $V_{GT}$ = 12V open circuit, 20 ohm–0.1 usec. rise time
Note 2: $I_{TM}$ = 50A, di/dt = 5A/usec., $V_R$ during turn-off interval = 50V min., reapplied dv/dt = 20V/usec., linear to rated $V_{DRM}$, $V_{GT}$ = 0V

## Triggering

| | | | |
|---|---|---|---|
| Max. gate voltage to trigger | $V_{GT}$ | 3.0V | $T_J$ = 25°C |
| Max. nontriggering gate voltage | $V_{GD}$ | 0.25V | $T_J$ = 125°C |
| Max. gate current to trigger | $I_{GT}$ | 100mA | $T_J$ = 25°C |
| Max. peak gate power | $P_{GM}$ | 15W | |
| Average gate power | $P_{G(AV)}$ | 3.0W | $t_p$ = 10 usec. |
| Max. peak gate current | $I_{GM}$ | 4.0A | |
| Max. peak gate voltage (forward) | $V_{GM}$ | 10V | |
| Max. peak gate voltage (reverse) | $V_{GM}$ | 5.0V | |

## Blocking

| | | | |
|---|---|---|---|
| Max. leakage current | $I_{DRM}$,$I_{RRM}$ | 10mA | $T_J$ =125°C & $V_{DRM}$,$V_{RRM}$ |
| Max. reverse leakage | $I_{DRM}$,$I_{RRM}$ | 100uA | $T_J$ =25°C & $V_{DRM}$,$V_{RRM}$ |
| Critical rate of rise of off-state voltage | dv/dt | 200V/usec. | $T_J$ =125°C |

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Figure 1
Typical Forward On–State Characteristics

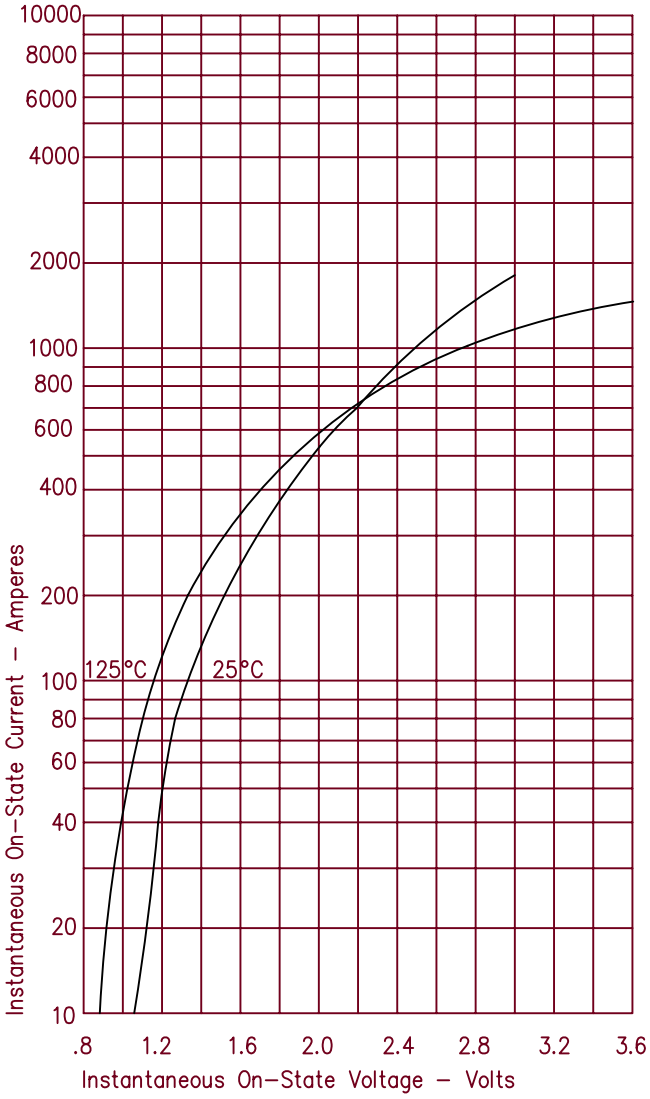


Figure 2
Forward Current Derating

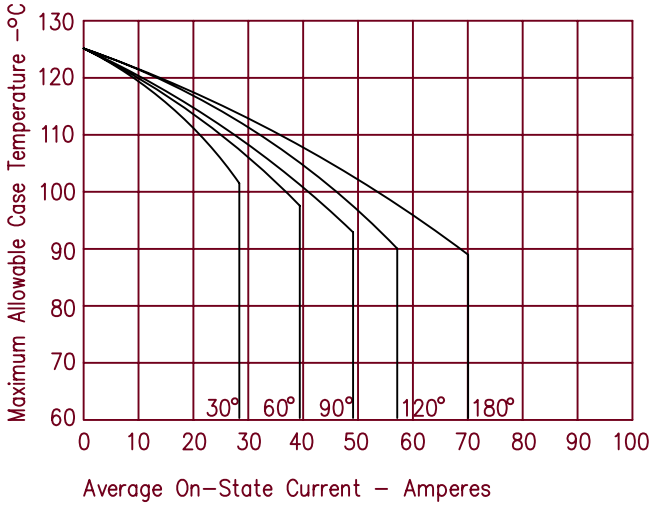


Figure 3
Maximum Power Dissipation

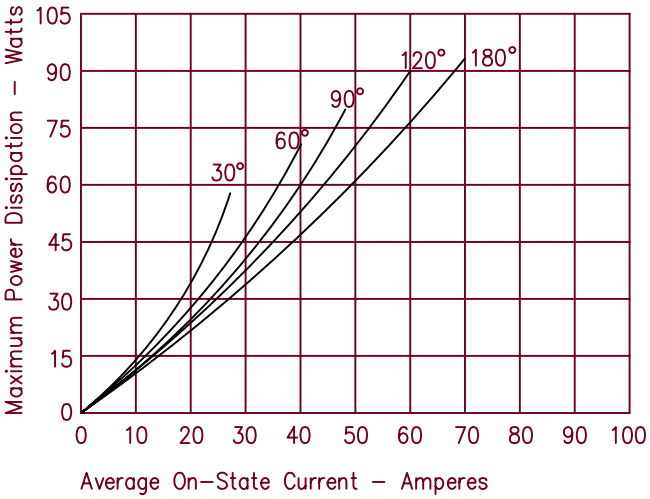


Figure 4
Transient Thermal Impedance