

2N6394 Series

Preferred Device

Silicon Controlled Rectifiers

Reverse Blocking Thyristors

Designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supplies.

- Glass Passivated Junctions with Center Gate Geometry for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Blocking Voltage to 800 Volts
- Device Marking: Logo, Device Type, e.g., 2N6394, Date Code

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

| Rating | Symbol | Value | Unit |
|---|--------------------------|-------------------------|----------------------|
| Peak Repetitive Off-State Voltage (Note 1.) ($T_J = -40$ to 125°C , Sine Wave, 50 to 60 Hz, Gate Open) | V_{DRM} , V_{RRM} | 50 100 400 800 | Volts |
| On-State RMS Current (180° Conduction Angles; $T_C = 90^\circ\text{C}$) | $I_{T(RMS)}$ | 12 | A |
| Peak Non-Repetitive Surge Current (1/2 Cycle, Sine Wave, 60 Hz, $T_J = 90^\circ\text{C}$) | I_{TSM} | 100 | A |
| Circuit Fusing ($t = 8.3$ ms) | I^2t | 40 | A^2s |
| Forward Peak Gate Power (Pulse Width ≤ 1.0 μs , $T_C = 90^\circ\text{C}$) | P_{GM} | 20 | Watts |
| Forward Average Gate Power ($t = 8.3$ ms, $T_C = 90^\circ\text{C}$) | $P_{G(AV)}$ | 0.5 | Watts |
| Forward Peak Gate Current (Pulse Width ≤ 1.0 μs , $T_C = 90^\circ\text{C}$) | I_{GM} | 2.0 | A |
| Operating Junction Temperature Range | T_J | -40 to +125 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -40 to +150 | $^\circ\text{C}$ |

*Indicates JEDEC Registered Data

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.



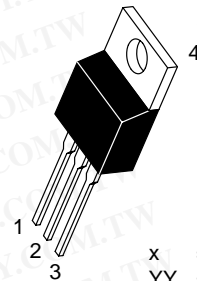
ON Semiconductor™

<http://onsemi.com>

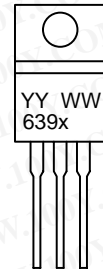
SCRs
12 AMPERES RMS
50 thru 800 VOLTS



MARKING DIAGRAM



TO-220AB
 CASE 221A
 STYLE 3



x = 4, 5, 7 or 9
 YY = Year
 WW = Work Week

PIN ASSIGNMENT

| Pin | Assignment |
|-----|------------|
| 1 | Cathode |
| 2 | Anode |
| 3 | Gate |
| 4 | Anode |

ORDERING INFORMATION

| Device | Package | Shipping |
|--------|---------|----------|
| 2N6394 | TO220AB | 500/Box |
| 2N6395 | TO220AB | 500/Box |
| 2N6397 | TO220AB | 500/Box |
| 2N6399 | TO220AB | 500/Box |

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

2N6394 Series

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|---------------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 2.0 | $^{\circ}C/W$ |
| Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds | T_L | 260 | $^{\circ}C$ |

ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}C$ unless otherwise noted.)

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

OFF CHARACTERISTICS

| | | | | | |
|---|--------------------|---|---|-----|---------|
| *Peak Repetitive Forward or Reverse Blocking Current ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}, \text{ Gate Open}$) | I_{DRM}, I_{RRM} | - | - | 10 | μA |
| $T_J = 25^{\circ}C$ | | | | | |
| $T_J = 125^{\circ}C$ | | - | - | 2.0 | mA |

ON CHARACTERISTICS

| | | | | | |
|---|----------|-----|-----|-----|---------|
| *Peak Forward On-State Voltage (Note 2.) ($I_{TM} = 24 \text{ A Peak}$) | V_{TM} | - | 1.7 | 2.2 | Volts |
| *Gate Trigger Current (Continuous dc) ($V_D = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$) | I_{GT} | - | 5.0 | 30 | mA |
| *Gate Trigger Voltage (Continuous dc) ($V_D = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$) | V_{GT} | - | 0.7 | 1.5 | Volts |
| Gate Non-Trigger Voltage ($V_D = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}, T_J = 125^{\circ}C$) | V_{GD} | 0.2 | - | - | Volts |
| *Holding Current ($V_D = 12 \text{ Vdc}, \text{ Initiating Current} = 200 \text{ mA}, \text{ Gate Open}$) | I_H | - | 6.0 | 50 | mA |
| Turn-On Time ($I_{TM} = 12 \text{ A}, I_{GT} = 40 \text{ mAdc}, V_D = \text{Rated } V_{DRM}$) | t_{gt} | - | 1.0 | 2.0 | μs |
| Turn-Off Time ($V_D = \text{Rated } V_{DRM}$) ($I_{TM} = 12 \text{ A}, I_R = 12 \text{ A}$) ($I_{TM} = 12 \text{ A}, I_R = 12 \text{ A}, T_J = 125^{\circ}C$) | t_q | - | 15 | - | μs |
| | | - | 35 | - | |

DYNAMIC CHARACTERISTICS

| | | | | | |
|---|---------|---|----|---|-----------|
| Critical Rate-of-Rise of Off-State Voltage Exponential ($V_D = \text{Rated } V_{DRM}, T_J = 125^{\circ}C$) | dv/dt | - | 50 | - | $V/\mu s$ |
|---|---------|---|----|---|-----------|

*Indicates JEDEC Registered Data

2. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.

2N6394 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 |

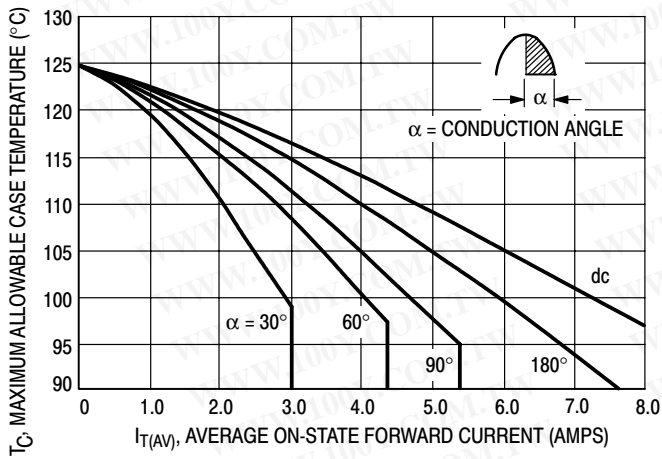
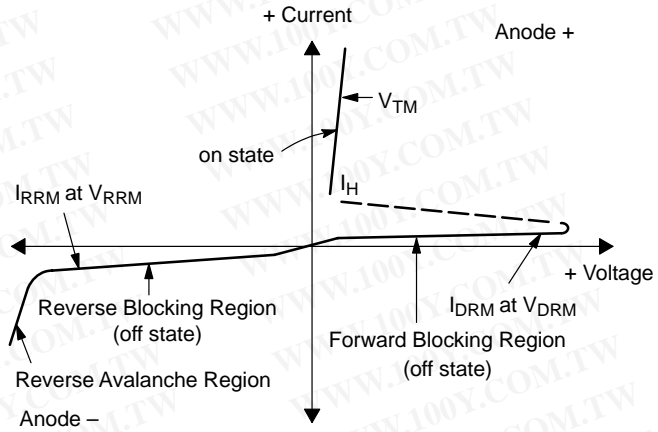


Figure 1. Current Derating

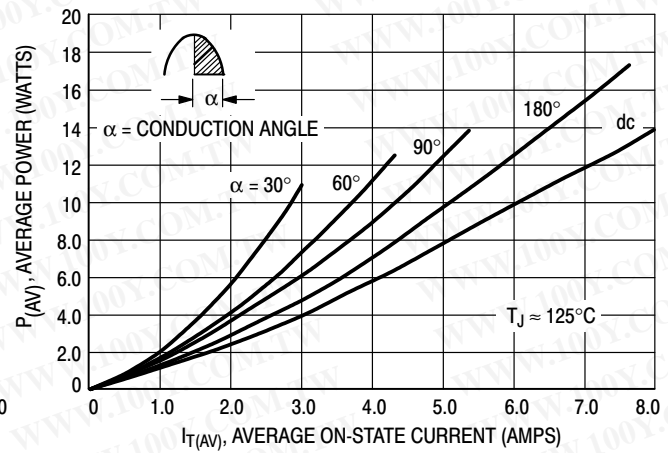


Figure 2. Maximum On-State Power Dissipation

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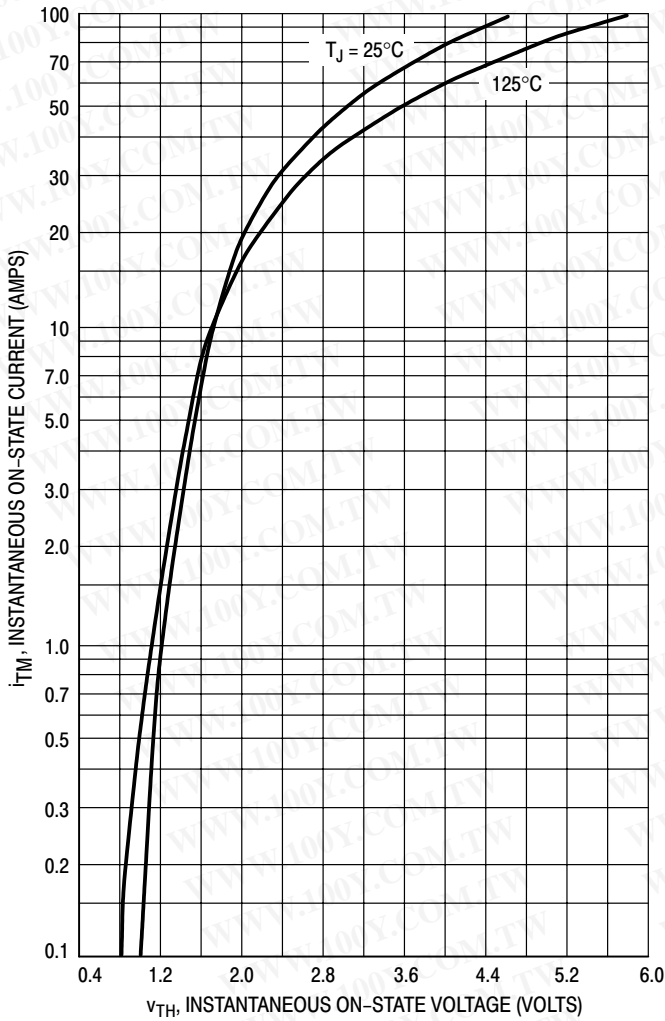


Figure 3. On-State Characteristics

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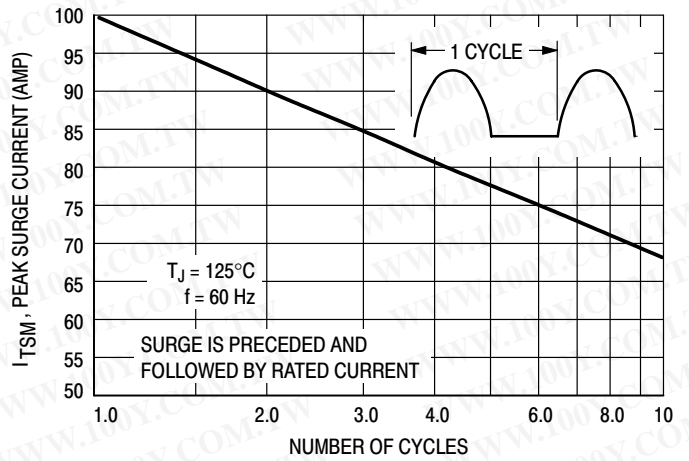


Figure 4. Maximum Non-Repetitive Surge Current

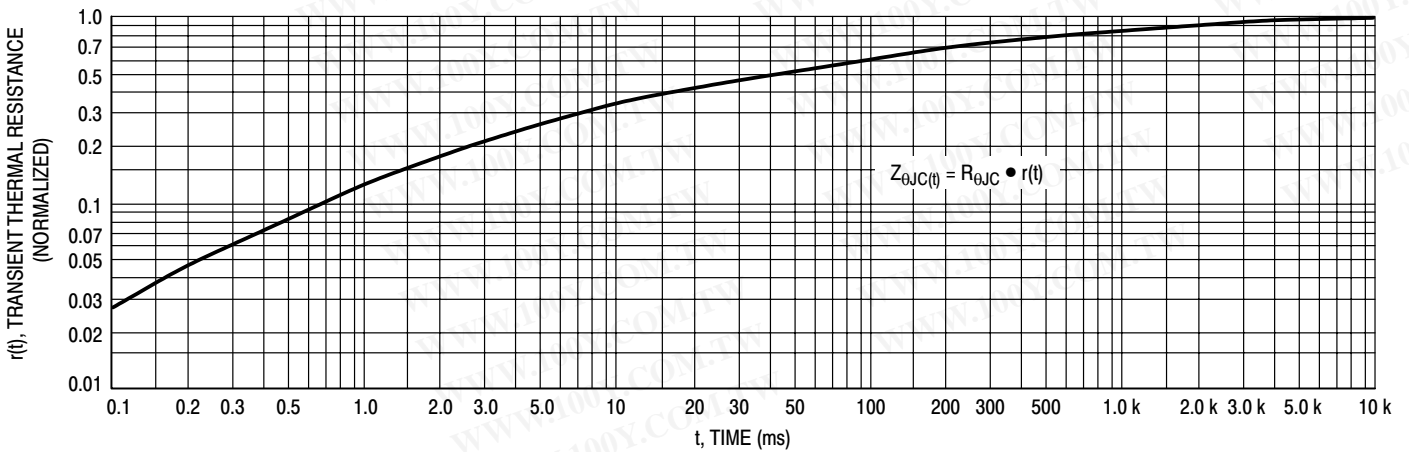


Figure 5. Thermal Response

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TYPICAL CHARACTERISTICS

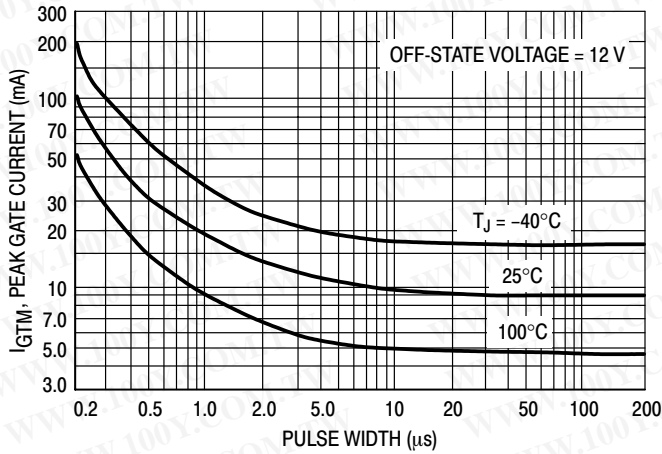


Figure 6. Typical Gate Trigger Current versus Pulse Width

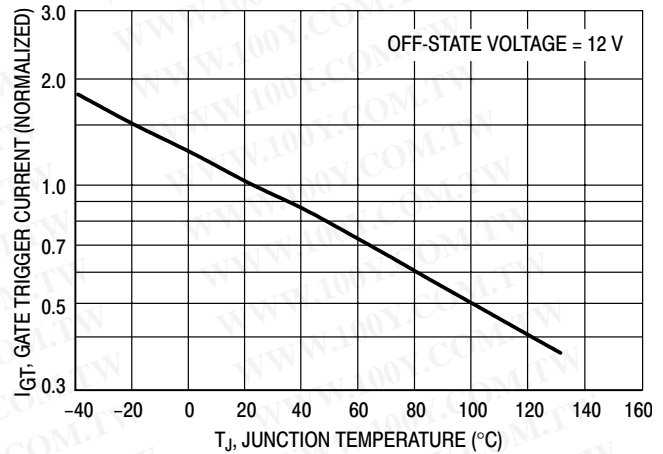


Figure 7. Typical Gate Trigger Current versus Temperature

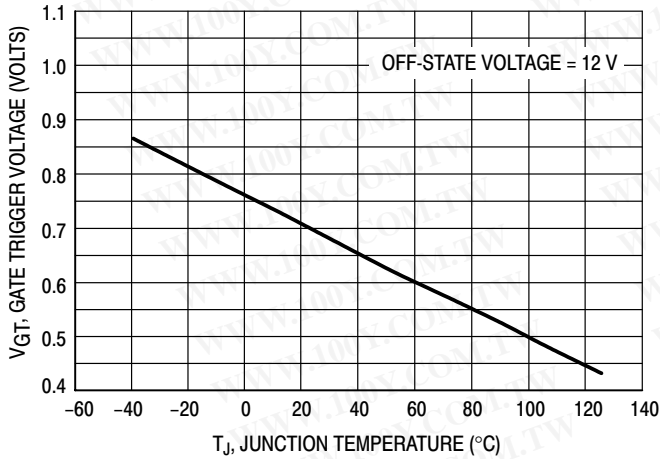


Figure 8. Typical Gate Trigger Voltage versus Temperature

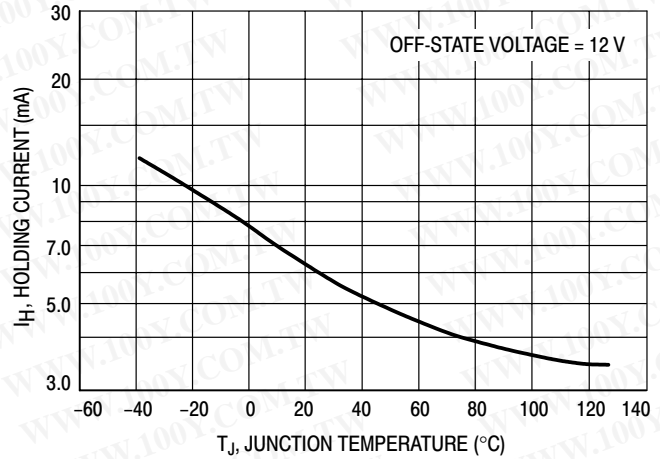


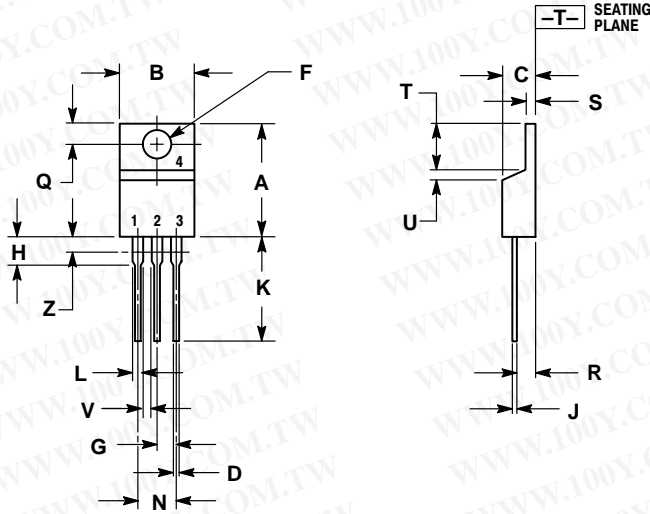
Figure 9. Typical Holding Current versus Temperature

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PACKAGE DIMENSIONS

TO-220AB
CASE 221A-07
ISSUE AA



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.147 | 3.61 | 3.73 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.014 | 0.022 | 0.36 | 0.55 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.15 | 1.52 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.15 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | --- | 1.15 | --- |
| Z | --- | 0.080 | --- | 2.04 |

- STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

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