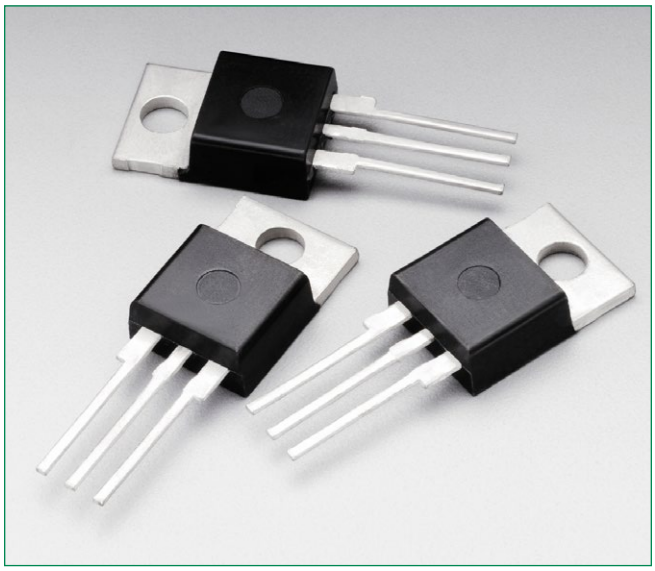
# 2N6344A, 2N6348A, 2N6349A



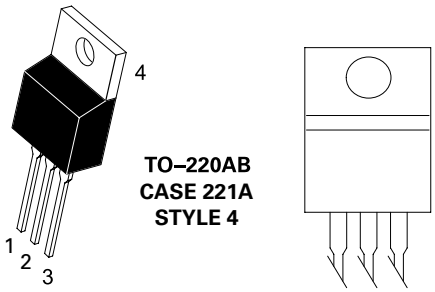
## Description

Designed primarily for full-wave AC control applications, such as light dimmers, motor controls, heating controls and power supplies; or wherever full-wave silicon gate controlled solid-state devices are needed. Triac type thyristors switch from a blocking to a conducting state for either polarity of applied anode voltage with positive or negative gate triggering.

## Features

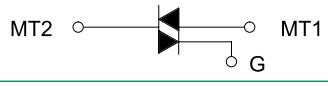
- Blocking Voltage to 800 V
- All Diffused and Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Gate Triggering Guaranteed in all Four Quadrants
- For 400 Hz Operation, Consult Factory
- 8.0 A Devices Available as 2N6344 thru 2N6349
- Pb–Free Package is Available

## Pin Out




**TO–220AB**
**CASE 221A**
**STYLE 4**

## Functional Diagram




## Additional Information

**Datasheet** | **Resources** | **Samples**


Revised: 07/24/19

## Maximum Ratings and Thermal Characteristics ($T_J$ = 25°C unless otherwise noted)

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| *Peak Repetitive Off-State Voltage (Note 1) ($T_J$ = -40 to 110°C, Sine Wave, 50 to 60 Hz, Gate Open) | 2N6344A, 2N6348A | $V_{DRM}$, $V_{RRM}$ | 600 | V |
| | 2N6349A | | 800 | |
| *On-State RMS Current (Full Cycle Sine Wave 50 to 60 Hz) | ($T_C$ =+80°C) | $I_{T\ (RMS)}$ | 12 | A |
| | ($T_C$ =+90°C) | | 6.0 | |
| *Peak Non–Repetitive Surge Current (One Full Cycle, Sine Wave 60 Hz, $T_C$ = +80°C) Preceded and followed by rated current | | $I_{TSM}$ | 100 | A |
| Circuit Fusing Considerations (t = 8.3 ms) | | $I^2t$ | 59 | $A^2s$ |
| *Peak Gate Power ($T_C$ = +80°C, Pulse Width = 2 µs) | | $P_{GM}$ | 20 | W |
| *Average Gate Power ($T_C$ = +80°C, t = 8.3 ms) | | $P_{G(AV)}$ | 0.5 | W |
| *Peak Gate Current ($T_C$ = +80°C, Pulse Width = 2.0 µs) | | $I_{GM}$ | 2.0 | A |
| *Peak Gate Voltage ($T_C$ = +80°C, Pulse Width = 2.0 µs) | | $V_{GM}$ | ±10 | V |
| *Operating Junction Temperature Range | | $T_J$ | -40 to +150 | °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.
* Indicates JEDEC Registered Data.
1. $V_{DRM}$ and $V_{RRM}$ for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

## Thermal Characteristics

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| † Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 2.0 | °C/W |
| Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds | $T_L$ | 260 | °C |

† Indicates JEDEC Registered Data.

## Electrical Characteristics - OFF ($T_C$ = 25°C unless otherwise noted; Electricals apply in both directions)

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| *Peak Repetitive Blocking Current ($V_D = V_{DRM} = V_{RRM}$; Gate Open) | $T_J$ = 25°C | $I_{DRM}$, $I_{RRM}$ | - | - | 1.0 | µA |
| | $T_J$ = 100°C | | - | - | 2.0 | mA |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## Electrical Characteristics - ON ($T_C$ = 25°C unless otherwise noted; Electricals apply in both directions)

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| †Peak On–State Voltage ($I_{TM}$ = ±17 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle ≤ 2%) | | $V_{TM}$ | - | 1.3 | 175 | V |
| **Gate Trigger Current (Continuous dc) ($V_D$ = 12 Vdc, $R_L$ = 100 Ω)** | | | | | | |
| Quadrant I: MT2(+), G(+) | All | $I_{GT}$ | - | 6.0 | 50 | mA |
| Quadrant II: MT2(+), G(–) | 2N6348A & 2N6349A | | - | 6.0 | 75 | |
| Quadrant III: MT2(–), G(–) | All | | - | 10 | 50 | |
| Quadrant IV: MT2(–), G(+) | 2N6348A & 2N6349A | | - | 25 | 75 | |
| †MT2(+), G(+); MT2(–), G(–) | $T_C$ = –40°C | | - | – | 100 | |
| †MT2(+), G(–); MT2(–), G(+) | $T_C$ = –40°C | | - | – | 125 | |
| **Gate Trigger Voltage (Continuous dc) ($V_D$ = 12 Vdc, $R_L$ = 100 Ω)** | | | | | | |
| Quadrant I: MT2(+), G(+) | Both | $V_{GT}$ | – | 0.9 | 2.0 | V |
| Quadrant II: MT2(+), G(–) | 2N6349 only | | – | 0.9 | 2.5 | |
| Quadrant III: MT2(–), G(–) | Both | | – | 1.1 | 2.0 | |
| Quadrant IV: MT2(–), G(+) | 2N6349 only | | – | 1.4 | 2.5 | |
| †MT2(+), G(+); MT2(–), G(–) TC = –40°C | $T_C$ = –40°C | | – | – | 2.5 | |
| †MT2(+), G(–); MT2(–), G(+) TC = –40°C | $T_C$ = –40°C | | – | – | 3.0 | |
| Gate Non–Trigger Voltage (Continuous dc) ($V_D$ = Rated $V_{DRM}$, $R_L$ = 10 k Ω, $T_J$ = 100°C) | | $V_{GD}$ | .02 | - | - | |
| †MT2(+), G(+); MT2(–), G(–); MT2(+), G(–); MT2(–), G(–) | TC = 25°C | $I_H$ | - | 6.0 | 40 | mA |
| | TC = -40°C | | - | - | 75 | |
| †Turn-On Time ($V_D$ = Rated $V_{DRM}$, $I_{TM}$ = 11 A, $I_{GT}$ = 120 mA, Rise Time = 0.1 µs, Pulse Width = 2 µs) | | $t_{gt}$ | - | 1.5 | 2.0 | µs |

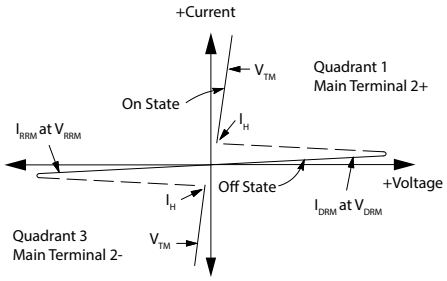
† Indicates JEDEC Registered Data.

## Dynamic Characteristics

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Critical Rate of Rise of Commutation Voltag ($V_D$ = Rated $V_{DRM}$, $I_{TM}$ = 17 A, Commutating di/dt = 6.1 A/ms, Gate Unenergized, $T_C$ = 80°C) | dv/dt(c) | – | 5.0 | – | V/µs |

## Voltage Current Characteristic of SCR

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





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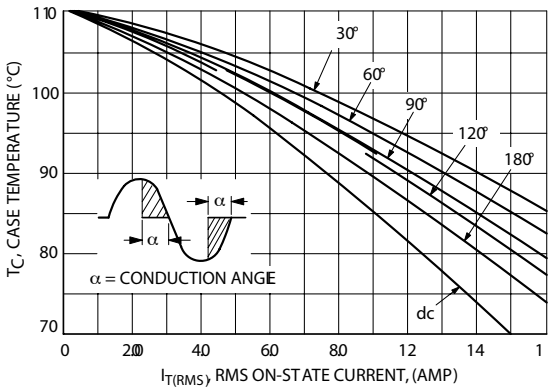
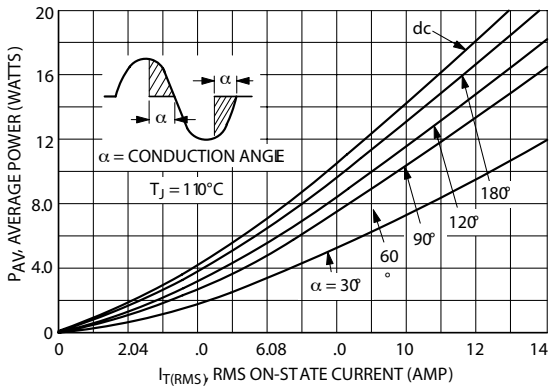
## Ratings and Characteristic Curves

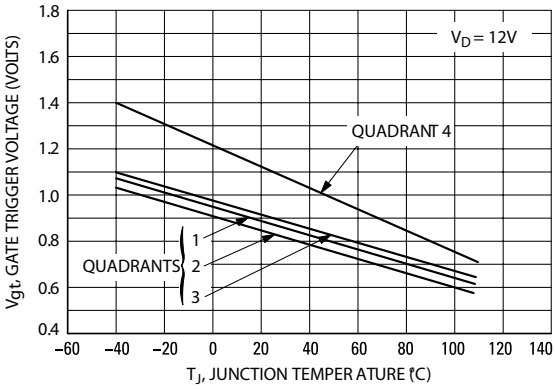
### Figure 1. RMS Current Derating



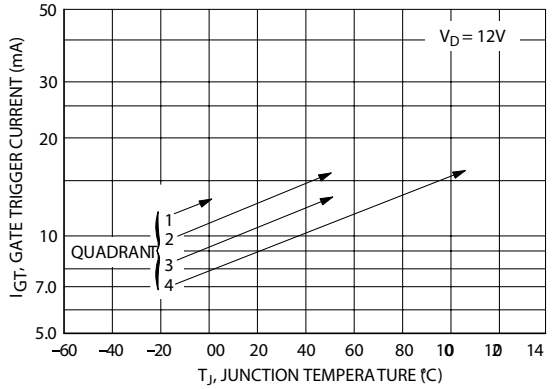

### Figure 2. On–State Power Dissipation




### Figure 3. Typical Gate Trigger Voltage




### Figure 4. Typical Gate Trigger Current





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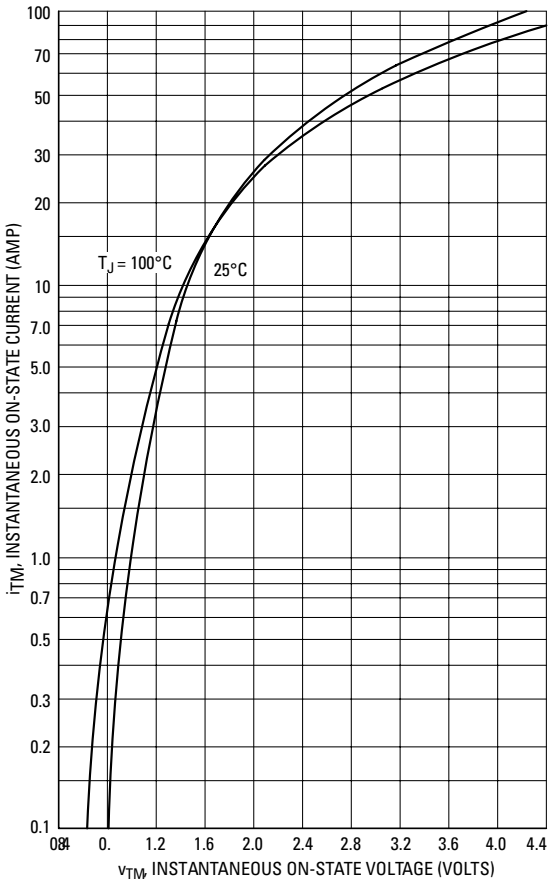
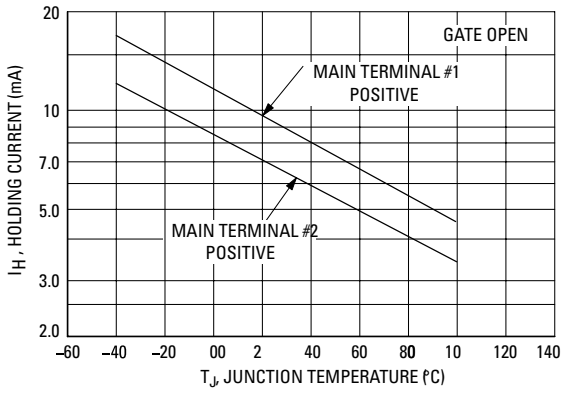
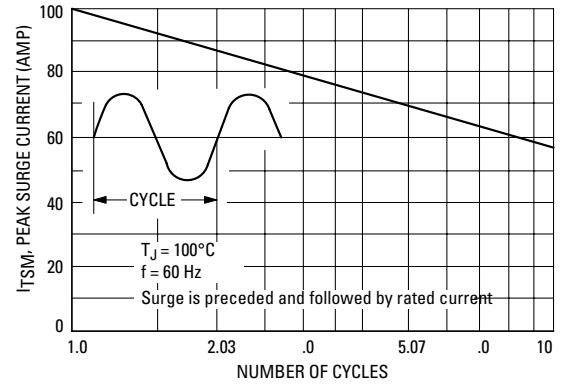
## Figure 7. Maximum On-State Characteristics



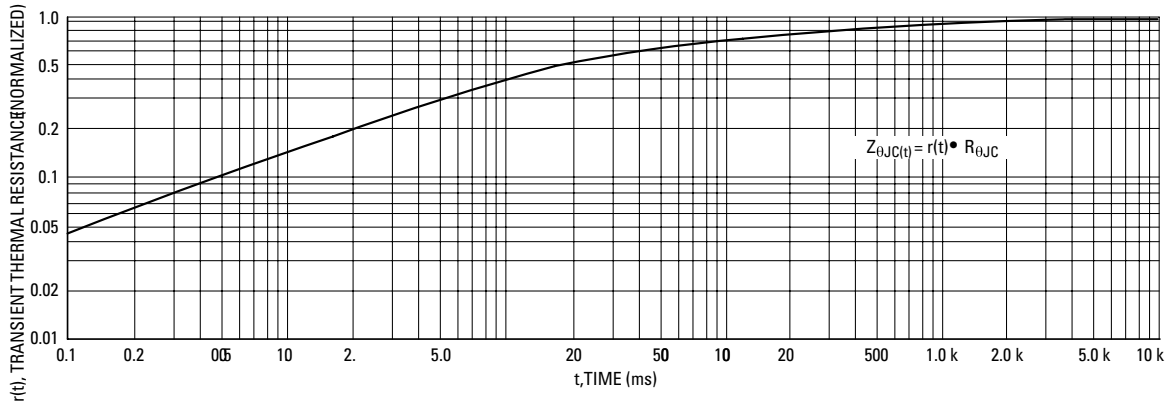

## Figure 8. Typical Holding Current




## Figure 9. Maximum Allowable Surge Current




## Figure 10. Typical Thermal Response





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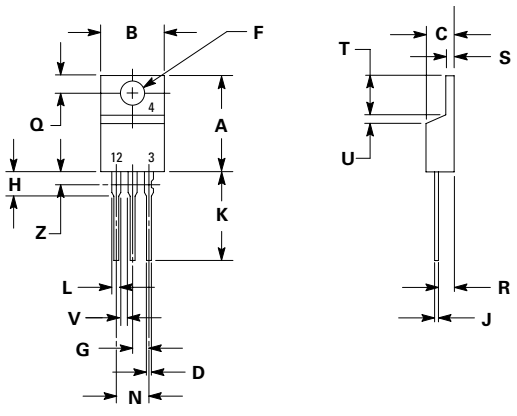
# Thyristors

## Surface Mount – 600-800V > 2N6344A, 2N6348A, 2N6349A

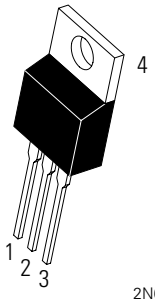
## Dimensions



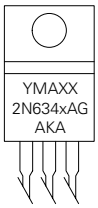

| Dim | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.590 | 0.620 | 14.99 | 15.75 |
| B | 0.380 | 0.420 | 9.65 | 10.67 |
| C | 0.178 | 0.188 | 4.52 | 4.78 |
| D | 0.025 | 0.035 | 0.64 | 0.89 |
| F | 0.142 | 0.147 | 3.61 | 3.73 |
| G | 0.095 | 0.105 | 2.41 | 2.67 |
| H | 0.110 | 0.130 | 2.79 | 3.30 |
| J | 0.018 | 0.024 | 0.46 | 0.61 |
| K | 0.540 | 0.575 | 13.72 | 14.61 |
| L | 0.060 | 0.075 | 1.52 | 1.91 |
| N | 0.195 | 0.205 | 4.95 | 5.21 |
| Q | 0.105 | 0.115 | 2.67 | 2.92 |
| R | 0.085 | 0.095 | 2.16 | 2.41 |
| S | 0.045 | 0.060 | 1.14 | 1.52 |
| 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 |

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.

## Part Marking System




**TO-220AB**
**Case 221A**
**Style 3**




| | |
|---|---|
| 2N634xA | =Device Code |
| Y | =Year |
| M | =Month |
| A | =Assembly Site |
| AKA | =Diode Polarity |
| G | =Pb-Free Package |

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

## Ordering Information

| Device | Package | Shipping† |
|---|---|---|
| 2N6344A | TO-220AB | 500 Units / Box |
| 2N6344AG | TO-220AB (Pb-Free) | |
| 2N6348A | TO-220AB | |
| 2N6348AG | TO-220AB (Pb-Free) | |
| 2N6349A | TO-220AB | |
| 2N6349AG | TO-220AB (Pb-Free) | |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LifeElectronics
Живое партнерство

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