

# Silicon Controlled Rectifiers Reverse Blocking Triode Thyristors

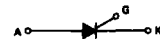
... designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supplies.

- 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

**2N6394\*  
thru\*  
2N6399\***

\*Motorola preferred device

**SCRs  
12 AMPERES RMS  
50 thru 800 VOLTS**



**CASE 221A-04  
(TO-220AB)  
STYLE 3**

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

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage, Note 1 (Gate Open, $T_J = -40$ to $125^\circ\text{C}$ )	$V_{RRM}$ or $V_{DRM}$	50 100 200 400 600 800	Volts
RMS On-State Current (All Conduction Angles)	$I_T(\text{RMS})$	12	Amps
Peak Non-Repetitive Surge Current (1/2 cycle, Sine Wave, 60 Hz, $T_J = 125^\circ\text{C}$ )	$I_{TSM}$	100	Amps
Circuit Fusing ( $t = 8.3$ ms)	$I^2t$	40	$\text{A}^2\text{s}$
Forward Peak Power	$P_{GM}$	20	Watts
Forward Average Gate Power	$P_{G(\text{AV})}$	0.5	Watt
Forward Peak Gate Current	$I_{GM}$	2	Amps
Operating Junction Temperature Range	$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +150	$^\circ\text{C}$

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2	$^\circ\text{C/W}$

\*Indicates JEDEC Registered Data.

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; 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.

## 2N6394 thru 2N6399

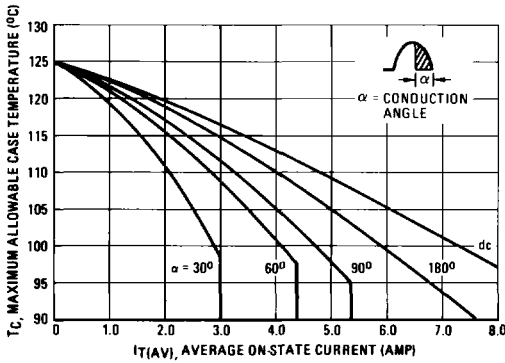
**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
*Peak Repetitive Forward or Reverse Blocking Current ( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}, \text{ Gate Open}$ ) $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	$I_{DRM}, I_{RRM}$	— —	— —	10 2	$\mu\text{A}$ mA
*Forward "On" Voltage ( $I_{TM} = 24 \text{ A Peak}$ )	$V_{TM}$	—	1.7	2.2	Volts
*Gate Trigger Current (Continuous dc) ( $V_D = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$ )	$I_{GT}$	—	5	30	mA
*Gate Trigger Voltage (Continuous dc) ( $V_D = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$ ) ( $V_D = \text{Rated } V_{DRM}, R_L = 100 \text{ Ohms}, T_J = 125^\circ\text{C}$ )	$V_{GT}$ $V_{GD}$	— 0.2	0.7 —	1.5 —	Volts
*Holding Current ( $V_D = 12 \text{ Vdc}, \text{ Gate Open}$ )	$I_H$	—	6	40	mA
Turn-On Time ( $I_{TM} = 12 \text{ A}, I_{GT} = 40 \text{ mAdc}, V_D = \text{Rated } V_{DRM}$ )	$t_{gt}$	—	1	2	$\mu\text{s}$
Turn-Off Time ( $V_D = \text{Rated } V_{DRM}$ ) ( $I_{TM} = 12 \text{ A}, I_R = 12 \text{ A}$ ) ( $I_{TM} = 12 \text{ A}, I_R = 12 \text{ A}, T_J = 125^\circ\text{C}$ )	$t_q$	— —	15 35	— —	$\mu\text{s}$
Critical Rate-of-Rise of Off-State Voltage Exponential ( $V_D = \text{Rated } V_{DRM}, T_J = 125^\circ\text{C}$ )	$dv/dt$	—	50	—	$\text{V}/\mu\text{s}$

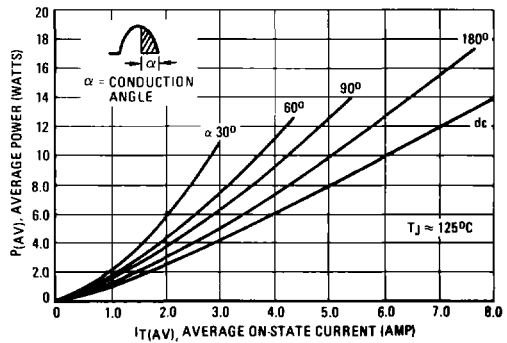
\*Indicates JEDEC Registered Data.

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**FIGURE 1 – CURRENT DERATING**



**FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION**



2N6394 thru 2N6399

FIGURE 3 - ON-STATE CHARACTERISTICS

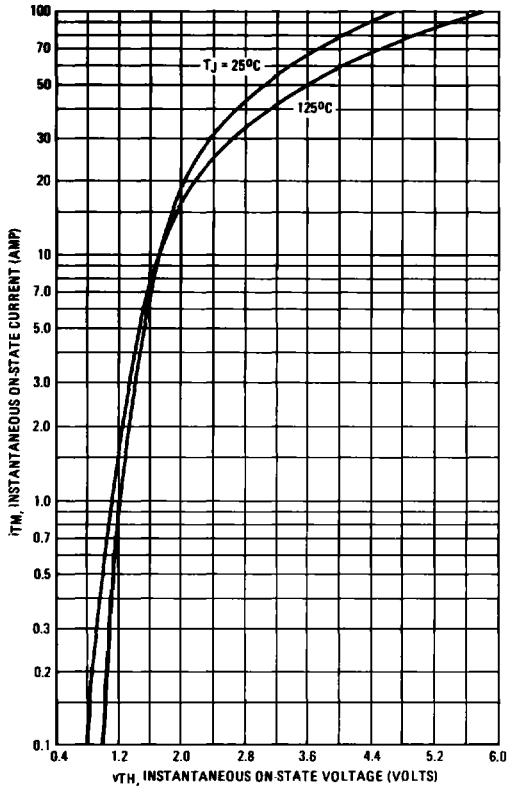


FIGURE 4 - MAXIMUM NON-REPETITIVE SURGE CURRENT

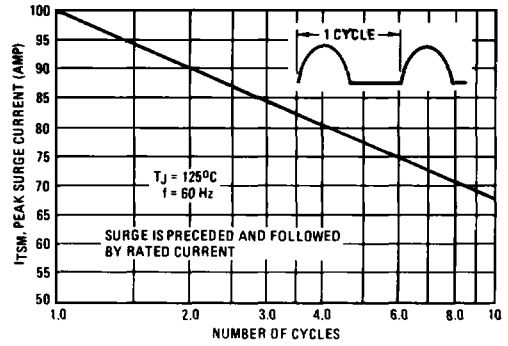
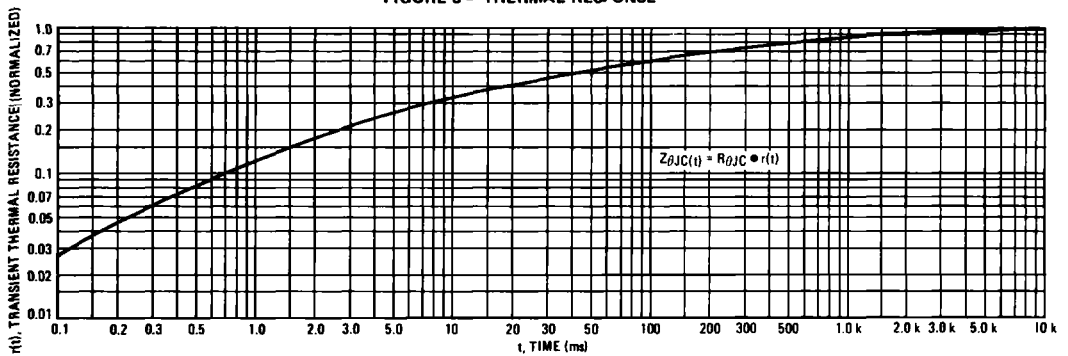


FIGURE 5 - THERMAL RESPONSE



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## TYPICAL CHARACTERISTICS

FIGURE 6 – PULSE TRIGGER CURRENT

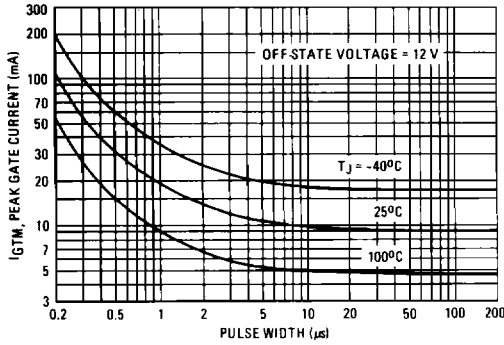


FIGURE 7 – GATE TRIGGER CURRENT

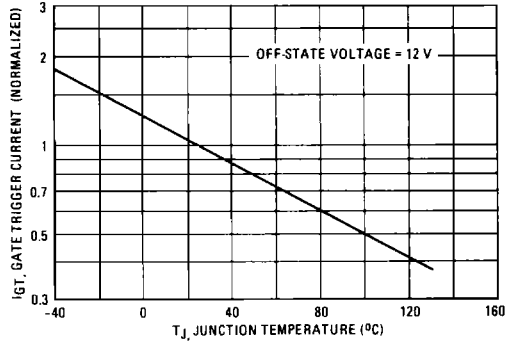


FIGURE 8 – GATE TRIGGER VOLTAGE

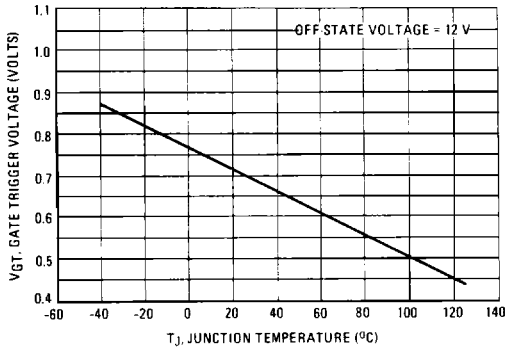
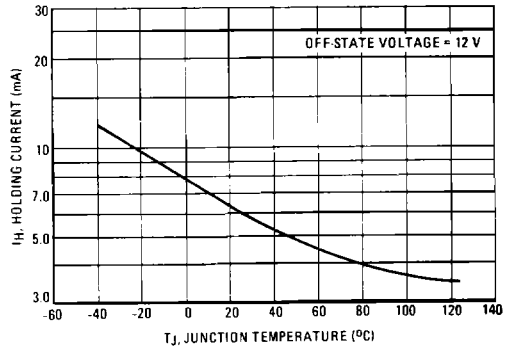


FIGURE 9 – HOLDING CURRENT



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