

Silicon Controlled Rectifiers

Reverse Blocking Triode Thyristors

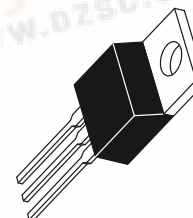
... designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supplies.

- 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 devices

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



**CASE 221A-07
 (TO-220AB)
 STYLE 3**

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

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage ⁽¹⁾ (Gate Open, $T_J = -40$ to 125°C)	V_{DRM}, V_{RRM}	50 100 400 600 800	Volts
RMS On-State Current ($T_C = 90^\circ\text{C}$) (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	A^2s
Forward Peak Power	P_{GM}	20	Watts
Forward Average Gate Power	$P_{G(AV)}$	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.

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.

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



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 ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$, Gate Open) $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	I_{DRM}, I_{RRM}	— —	— —	10 2	μA 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	μs
Turn-Off Time ($V_D = \text{Rated } V_{DRM}$) ($I_{TM} = 12 \text{ A}, I_R = 12 \text{ A}$) ($I_{TM} = 12 \text{ A}, I_R = 12 \text{ A}, T_J = 125^\circ\text{C}$)	t_q	— —	15 35	— —	μs
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.

FIGURE 1 — CURRENT DERATING

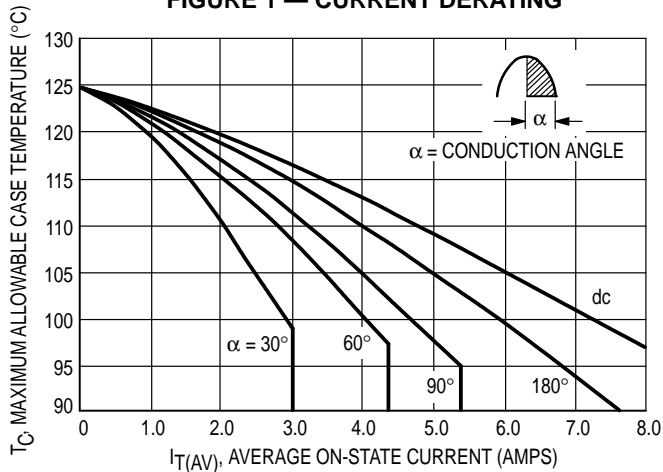


FIGURE 2 — MAXIMUM ON-STATE POWER DISSIPATION

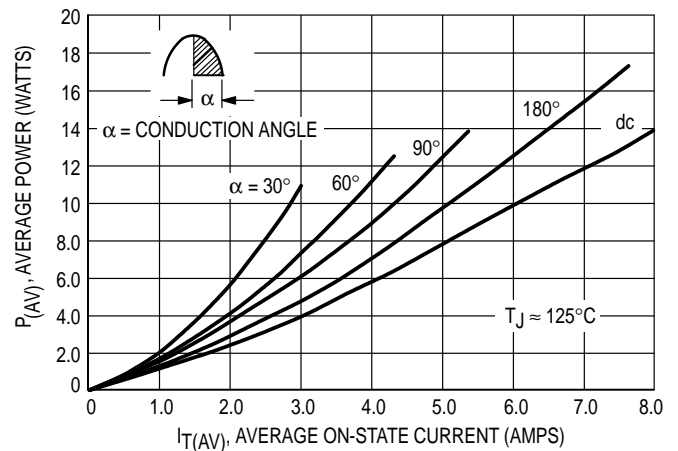


FIGURE 3 — ON-STATE CHARACTERISTICS

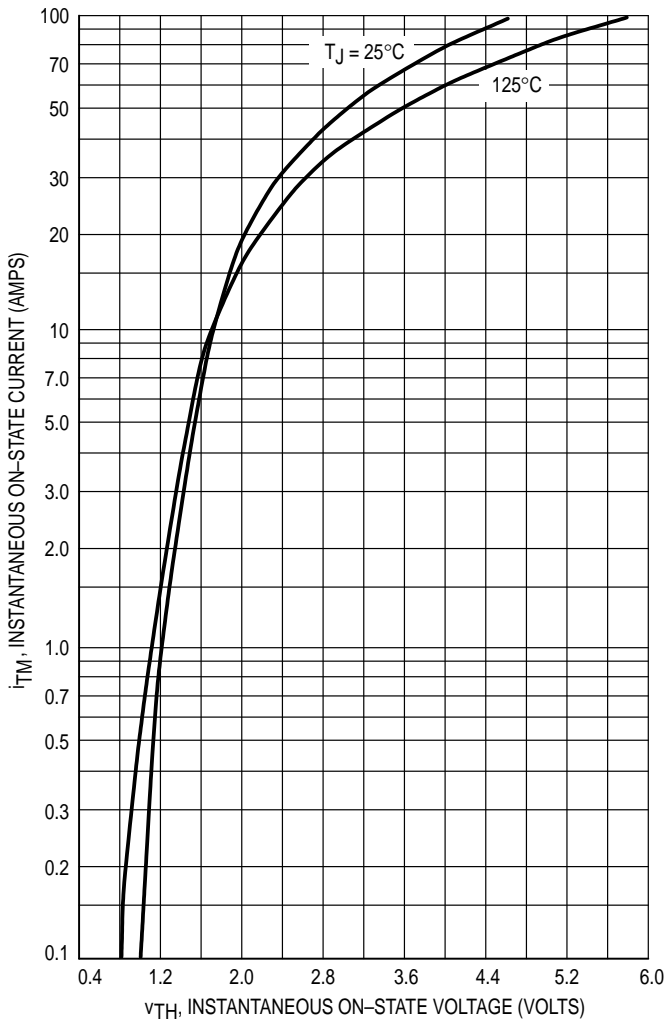


FIGURE 4 — MAXIMUM NON-REPETITIVE SURGE CURRENT

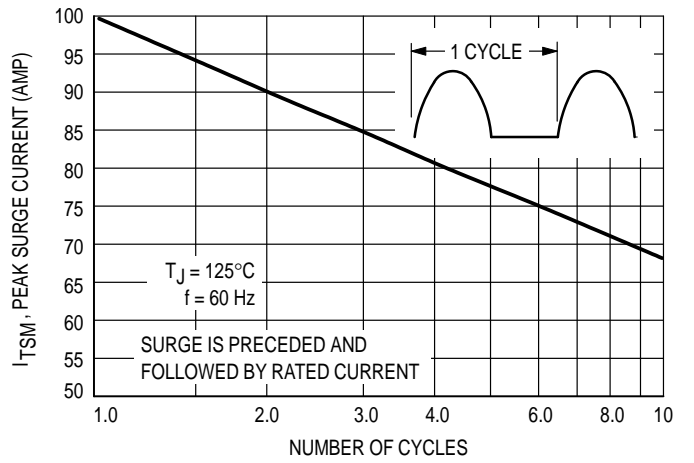
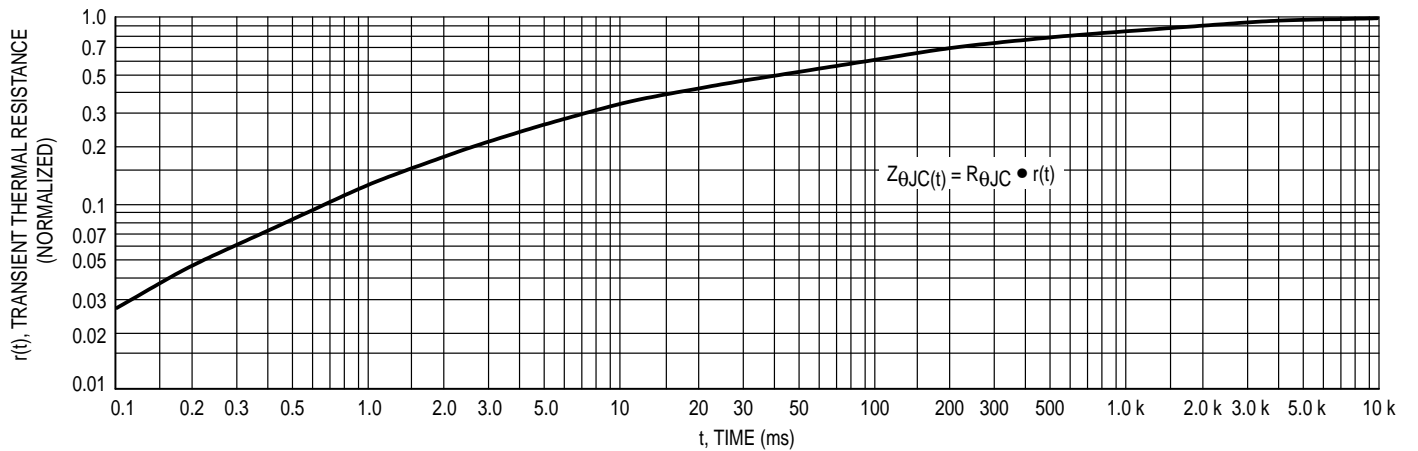


FIGURE 5 — THERMAL RESPONSE



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TYPICAL CHARACTERISTICS

FIGURE 6 — PULSE TRIGGER CURRENT

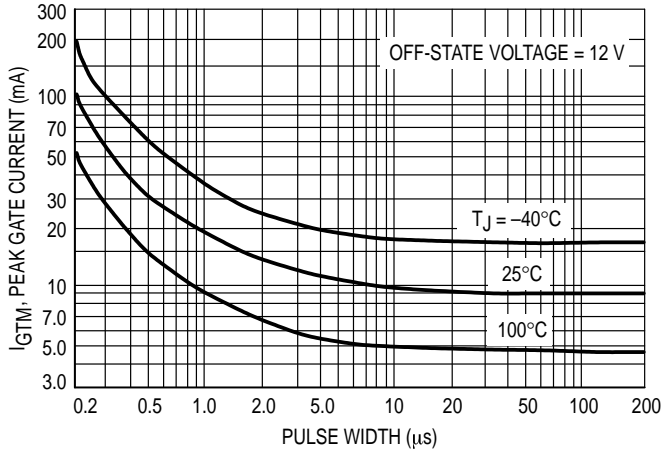


FIGURE 7 — GATE TRIGGER CURRENT

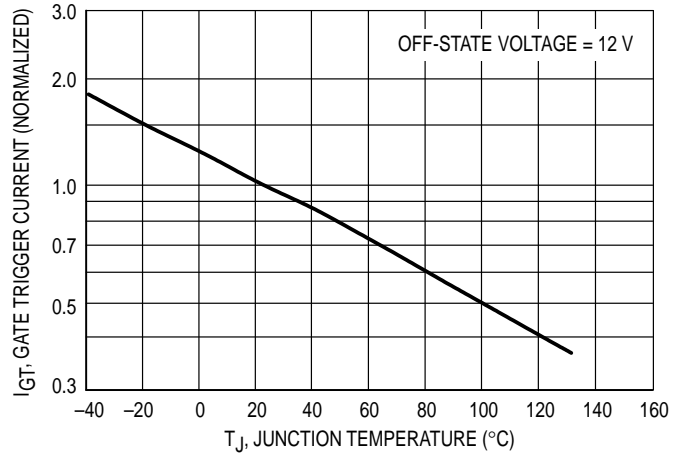


FIGURE 8 — GATE TRIGGER VOLTAGE

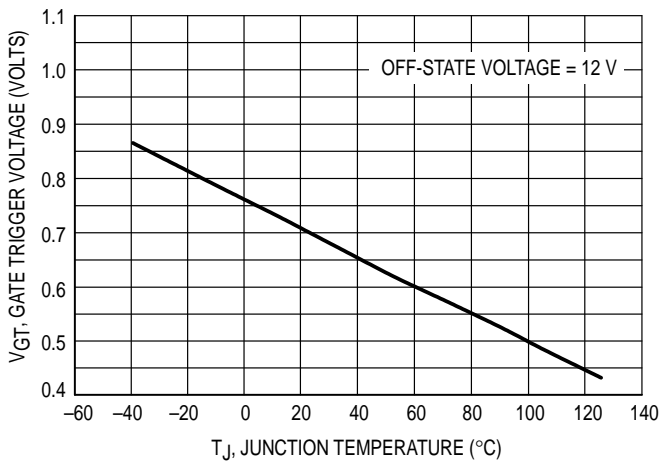
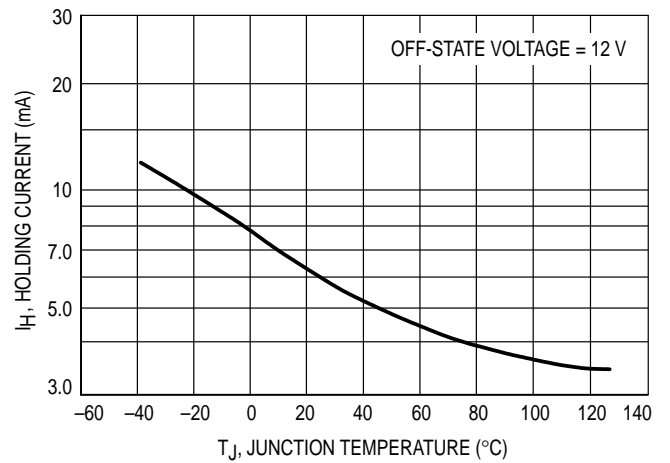
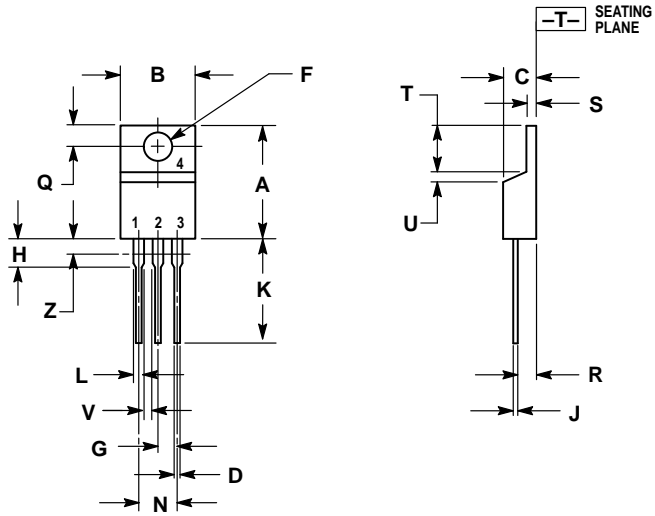


FIGURE 9 — HOLDING CURRENT



PACKAGE DIMENSIONS




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

CASE 221A-07
ISSUE Z

2N6394 thru 2N6399

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