

Thyristors

Silicon Controlled Rectifiers

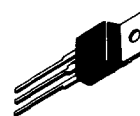
... designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supply crowbar circuits.

- Glass Passivated Junctions with Center Gate Fire for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Constructed for Low Thermal Resistance, High Heat Dissipation and Durability
- Blocking Voltage to 800 Volts
- 300 A Surge Current Capability

2N6504*
thru*
2N6509*

*Motorola preferred devices

SCRs
25 AMPERES RMS
50 thru 800 VOLTS



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

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MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
*Peak Forward and Reverse Blocking Voltage, Note 1 (Gate Open, T _J = 25 to 125°C)	V _{DORM} , V _R RM	50 100 200 400 600 800	Volts
Forward Current (T _C = 85°C) (180° Conduction Angle)	I _T (RMS) I _T (AV)	25 16	Amps
Peak Non-Repetitive Surge Current — 8.3 ms (1/2 Cycle, Sine Wave) 1.5 ms	I _{TSM}	300 350	Amps
Forward Peak Gate 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	°C
Storage Temperature Range	T _{stg}	-40 to +150	°C

*THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	1.5	°C/W

*Indicates JEDEC Registered Data.

Note 1. V_{DORM} 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.

2N6504 thru 2N6509

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

Characteristic	Symbol	Min	Typ	Max	Unit
*Peak 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	μA mA
*Forward "On" Voltage, Note 1 ($I_{TM} = 50 \text{ A}$)	V_{TM}	—	—	1.8	Volts
*Gate Trigger Current (Continuous dc) (Anode Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$) $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$	I_{GT}	— —	— 25	40 75	mA
*Gate Trigger Voltage (Continuous dc) (Anode Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}, T_C = -40^\circ\text{C}$)	V_{GT}	—	1	1.5	Volts
Gate Non-Trigger Voltage (Anode Voltage = Rated $V_{DRM}, R_L = 100 \text{ Ohms}, T_J = 125^\circ\text{C}$)	V_{GD}	0.2	—	—	Volts
*Holding Current (Anode Voltage = 12 Vdc, $T_C = -40^\circ\text{C}$)	I_H	—	35	40	mA
*Turn-On Time ($I_{TM} = 25 \text{ A}, I_{GT} = 50 \text{ mA}$)	t_{gt}	—	1.5	2	μs
Turn-Off Time ($V_{DRM} = \text{rated voltage}$) ($I_{TM} = 25 \text{ A}, I_R = 25 \text{ A}$) ($I_{TM} = 25 \text{ A}, I_R = 25 \text{ A}, T_J = 125^\circ\text{C}$)	t_q	— —	15 35	— —	μs
Critical Rate of Rise of Off-State Voltage (Gate Open, Rated V_{DRM} , Exponential Waveform)	dv/dt	—	50	—	$\text{V}/\mu\text{s}$

*Indicates JEDEC Registered Data.

Note 1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.

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FIGURE 1 — AVERAGE CURRENT DERATING

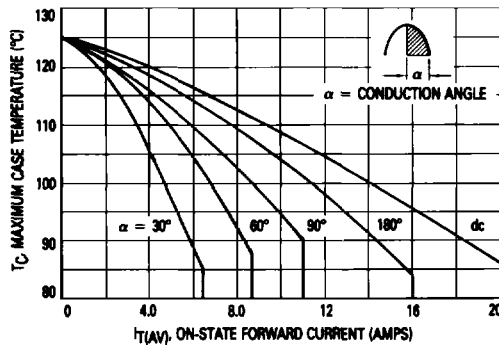
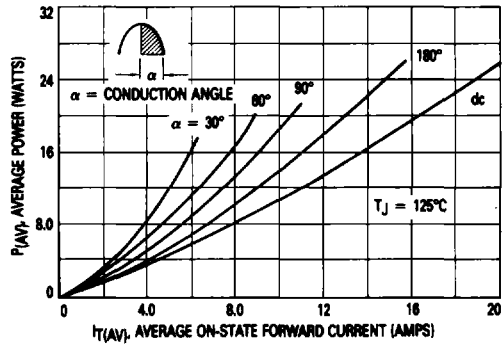


FIGURE 2 — MAXIMUM ON-STATE POWER DISSIPATION



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FIGURE 3 — MAXIMUM FORWARD VOLTAGE

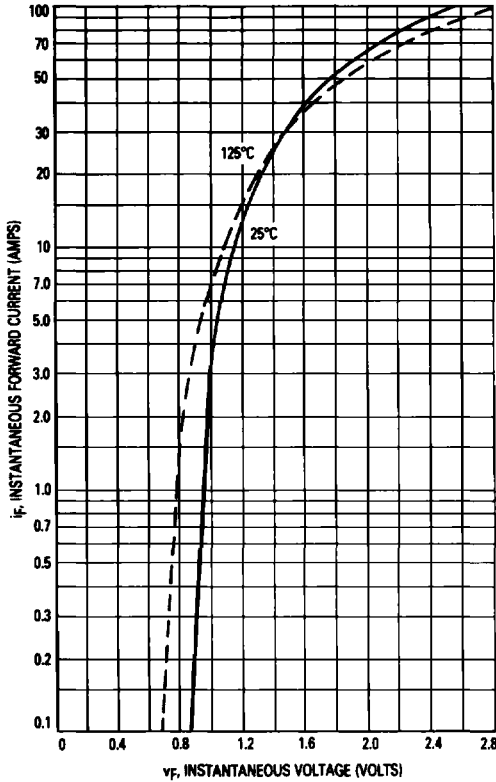


FIGURE 4 — MAXIMUM NON-REPETITIVE SURGE CURRENT

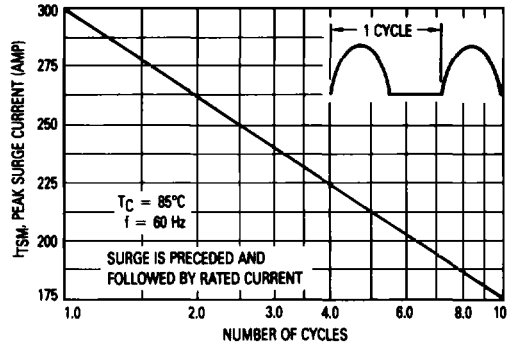
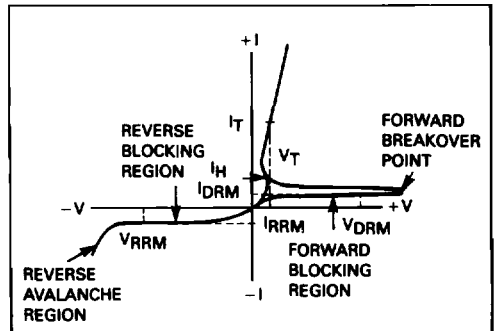
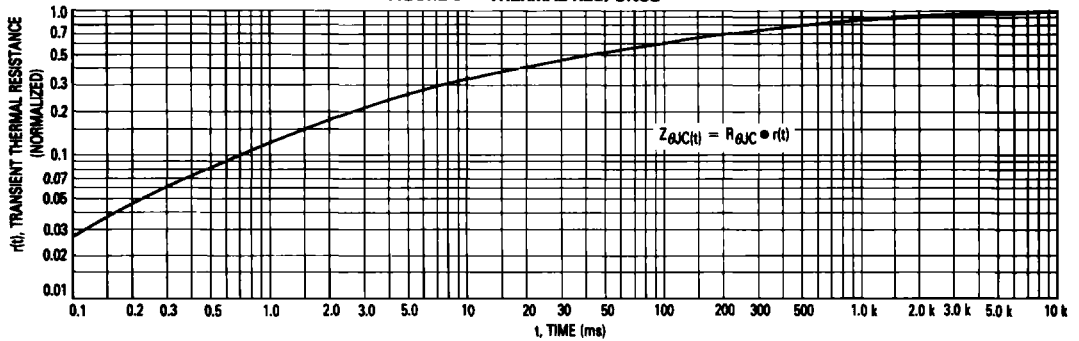


FIGURE 5 — CHARACTERISTICS AND SYMBOLS



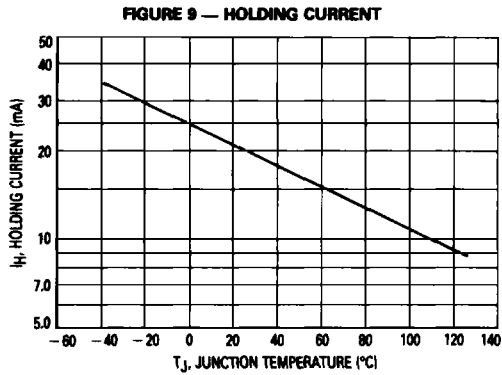
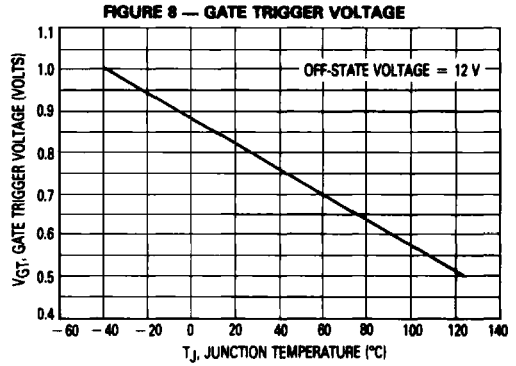
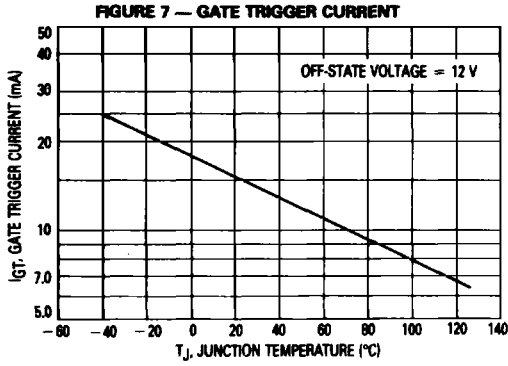
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FIGURE 6 — THERMAL RESPONSE



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TYPICAL TRIGGER CHARACTERISTICS



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