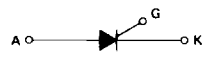
Thyristors
Silicon Controlled Rectifiers

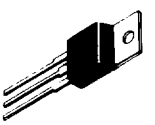
2N6504 thru 2N6509

SCRs
25 AMPERES RMS
50 thru 800 VOLTS

. . . 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





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

3

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
*Peak Reverse Blocking Voltage, Note 1	V_{RRM}		Volts
2N6504		50	
2N6505		100	
2N6506		200	
2N6507		400	
2N6508		600	
2N6509		800	
Forward Current (T_C 85°C) (All Conduction Angles)	$I_{T(RMS)}$	25	Amps
	$I_{T(AV)}$	16	
Peak Non-Repetitive Surge Current — 8.3 ms (1/2 Cycle, Sine Wave) 1.5 ms	I_{TSM}	300	Amps
		350	

*Indicates JEDEC Registered Data. (cont.)

Note 1. V_{RRM} for all types can be applied on a continuous dc basis without incurring damage. Ratings apply for zero or negative gate voltage. Devices should not be tested for blocking capability in a manner such that the voltage supplied exceeds the rated blocking voltage.

MAXIMUM RATINGS — continued

Rating	Symbol	Value	Unit
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	$R_{\theta JC}$	1.5	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
*Peak Forward Blocking Voltage (T_J = 125°C)	2N6504	V_{DRM}	50	—	—	Volts
	2N6505		100	—	—	
	2N6506		200	—	—	
	2N6507		400	—	—	
	2N6508		600	—	—	
	2N6509		800	—	—	
*Peak Forward or Reverse Blocking Current (Rated V_{DRM} or V_{RRM})	T_J = 25°C	I_{DRM}, I_{RRM}	—	—	10	μA
	T_J = 125°C		—	—	2	mA
*Forward "On" Voltage, Note 1 (I_{TM} = 50 A)		V_{TM}	—	—	1.8	Volts
*Gate Trigger Current (Continuous dc) (Anode Voltage = 12 Vdc, R_L = 100 Ohms)	T_C = 25°C	I_{GT}	—	—	40	mA
	T_C = −40°C		—	25	75	
*Gate Trigger Voltage (Continuous dc) (Anode Voltage = 12 Vdc, R_L = 100 Ohms, T_C = −40°C)		V_{GT}	—	1	1.5	Volts
Gate Non-Trigger Voltage (Anode Voltage = Rated V_{DRM}, R_L = 100 Ohms, T_J = 125°C)		V_{GD}	0.2	—	—	Volts
*Holding Current (Anode Voltage 12 Vdc, T_C = −40°C)		I_H	—	35	40	mA
*Turn-On Time (I_{TM} = 25 A, I_{GT} = 50 mAdc)		t_{gt}	—	1.5	2	μs
Turn-Off Time (V_{DRM} = rated voltage)		t_q				μs
(I_{TM} = 25 A, I_R = 25 A)			—	15	—	
(I_{TM} = 25 A, I_R = 25 A, T_J = 125°C)			—	35	—	
Critical Rate of Rise of Off-State Voltage (Gate Open, Rated V_{DRM}, Exponential Waveform)		dv/dt	—	50	—	V/μs

*Indicates JEDEC Registered Data.
Note 1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

3

FIGURE 1 — AVERAGE CURRENT DERATING

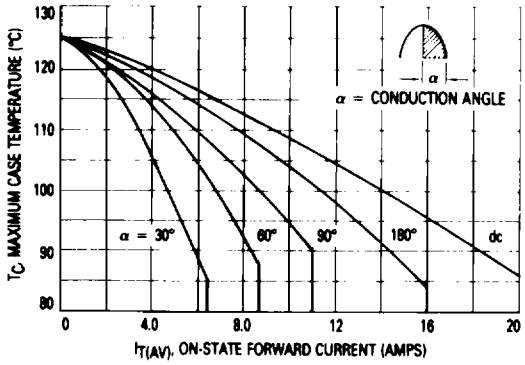


FIGURE 2 — MAXIMUM ON-STATE POWER DISSIPATION

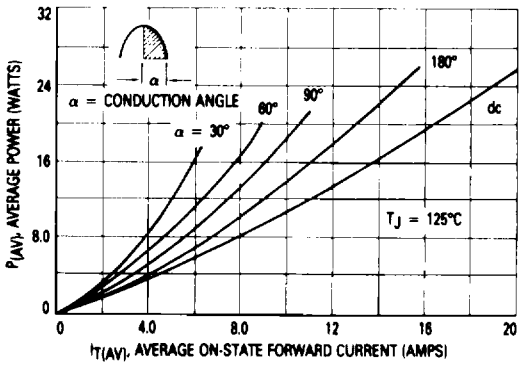


FIGURE 3 — MAXIMUM FORWARD VOLTAGE

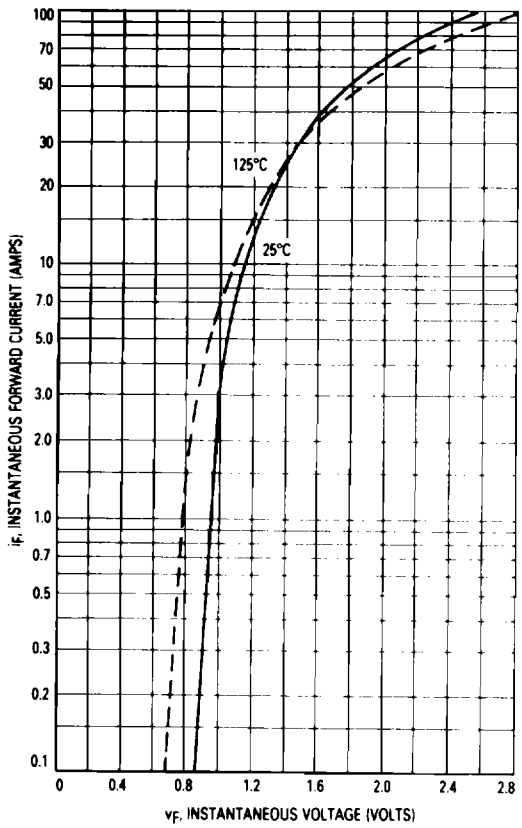


FIGURE 4 — MAXIMUM NON-REPETITIVE SURGE CURRENT

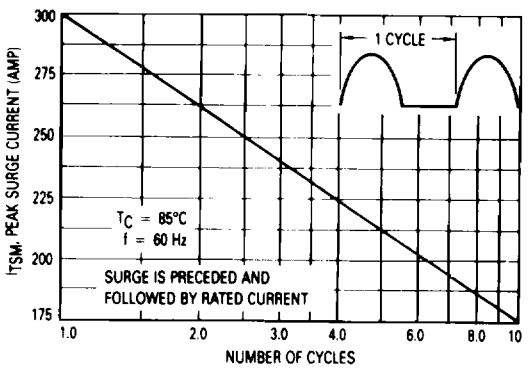
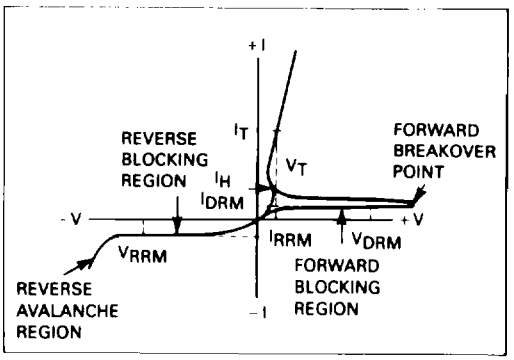
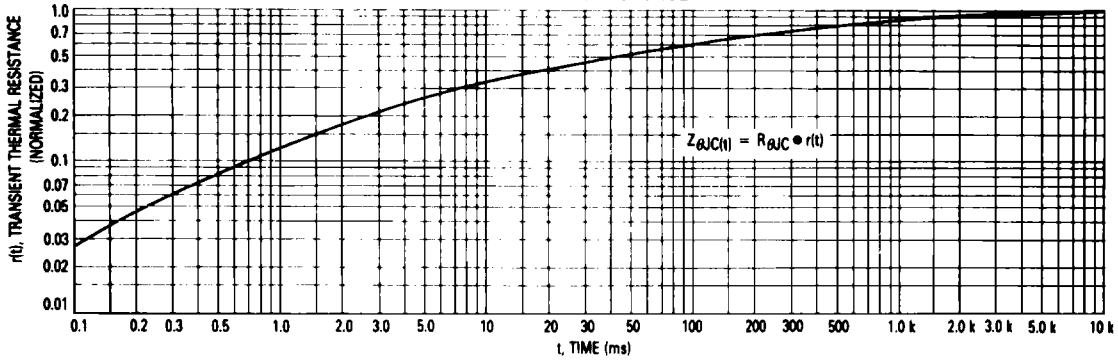


FIGURE 5 — CHARACTERISTICS AND SYMBOLS



3

FIGURE 6 — THERMAL RESPONSE



TYPICAL TRIGGER CHARACTERISTICS

FIGURE 7 — GATE TRIGGER CURRENT

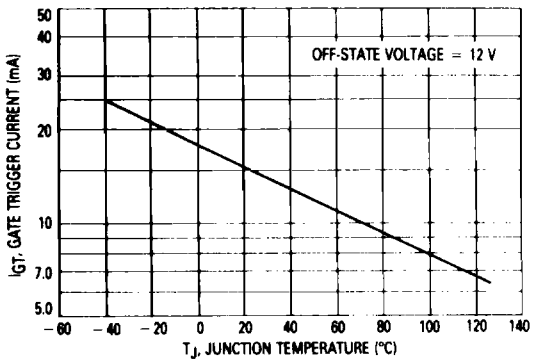


FIGURE 8 — GATE TRIGGER VOLTAGE

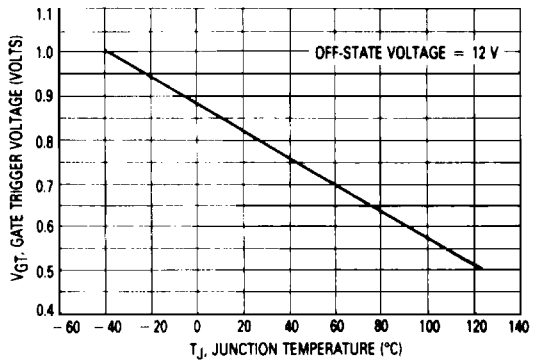


FIGURE 9 — HOLDING CURRENT