

# SCR

## 2N5204

### MAXIMUM ALLOWABLE RATINGS

Type	Repetitive Peak Off-State Voltage, $V_{DRM}^{(1)(2)}$ $T_C = -40^\circ\text{C to } +125^\circ\text{C}$	Repetitive Peak Reverse Voltage, $V_{RRM}^{(1)(2)}$ $T_C = -40^\circ\text{C to } +125^\circ\text{C}$	Non-repetitive Peak Reverse Voltage, $V_{RSM}^{(1)(3)}$ $T_C = -40^\circ\text{C to } +125^\circ\text{C}$
2N5204	600 Volts†	600 Volts†	720 Volts†

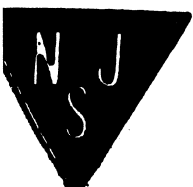
- (1) Values apply for gate terminal open-circuited. (Negative gate bias is permissible.)  
 (2) Maximum case-to-ambient thermal resistance for which maximum  $V_{DRM}$  and  $V_{RRM}$  ratings apply equals  $5.0^\circ\text{C}$  per watt for full sine wave or full-wave rectified sinusoidal voltage waveform. ( $3.0^\circ\text{C}$  per watt is maximum case-to-ambient thermal resistance for pure dc voltage waveform.)  
 (3) Half sine wave voltage pulse, 10 millisecond maximum duration.  
 (4) di/dt rating is established in accordance with EIA Standard RS-397, Section 5.2.2.6. Off-state (blocking) voltage capability may be temporarily lost immediately after each current pulse for duration less than the period of the applied pulse repetition rate. The pulse repetition rate for this test is 400 Hz. The duration of the JEDC di/dt test condition is 5.0 seconds (minimum).

RMS On-State Current, $I_{T(RMS)}$ .....	35 Amperes (all conduction angle)
Average On-State Current, $I_{T(AV)}$ .....	Depends on conduction angle (See Charts 3 and 4)
Critical Rate-of-Rise of On-State Current, di/dt: <sup>(4)</sup>	
Gate triggered operation.....	(See Chart 4)
Switching from 1200 volts.....	75 Amperes per microsecond
1000 volts.....	80 Amperes per microsecond
800 volts.....	90 Amperes per microsecond
600 volts.....	100 Amperes per microsecond
Breakover voltage triggered operation.....	10 Amperes per microsecond
Peak One Cycle Surge (non-rep) On-State Current, $I_{TSM}$ .....	300 Amperes
$I^2t$ (for fusing), for time = 1.0 milliseconds (See Chart 9).....	200 Ampere <sup>2</sup> second
for time = 8.3 milliseconds (See Chart 9).....	375 Ampere <sup>2</sup> second
Peak Gate Power Dissipation, $P_{GM}$ .....	.60 Watts for 500 microsecond
Average Gate Power Dissipation, $P_{G(AV)}$ .....	10 Watts
Peak Negative Gate Voltage, $V_{GM}$ .....	5 Volts
Storage Temperature, $T_{STG}$ .....	$-40^\circ\text{C to } +150^\circ\text{C}$
Operating Temperature, $T_J$ .....	$-40^\circ\text{C to } +125^\circ\text{C}$
Maximum Stud Torque.....	30 Lb-in (35 Kg-cm)

†Indicates data included on JEDEC Type Number Registration.

### CHARACTERISTICS

Test	Symbol	Min.	Max.	Units	Test Conditions
Peak Off-State or Reverse Current <sup>(1)(2)</sup>	$I_{DRM}$ or $I_{RRM}$	—	3.3†	mA	$T_C = -40^\circ\text{ to } +125^\circ\text{C}$  $V_{DRM} = V_{RRM} = 600\text{ Volts Peak}$
D.C. Gate Trigger Current	$I_T$	—	40	mA dc	$T_C = +25^\circ\text{C}, V_D = 12\text{ Vdc}, R_L = 12\text{ ohms}$ $T_C = -40^\circ\text{C}, V_D = 12\text{ Vdc}, R_L = 12\text{ ohms}$
D.C. Gate Trigger Voltage	$V_{GT}$	—	3.0	Vdc	$T_C = +25^\circ\text{C}, V_D = 12\text{ Vdc}, R_L = 12\text{ ohms}$ $T_C = -40^\circ\text{C}, V_D = 12\text{ Vdc}, R_L = 12\text{ ohms}$ $T_C = +125^\circ\text{C}, \text{Rated } V_{DRM}, R_L = 1000\text{ ohms}$
Peak On-State Voltage	$V_{TM}$	—	2.3†	Volts	$T_C = +25^\circ\text{C}, I_{TM} = 70\text{ A peak}, 1\text{ msec wide pulse.}$ Duty cycle $\leq 2\%$ .
Holding Current	$I_H$	—	100	mA dc	Anode supply = 24 Vdc, Gate supply = 10 V, 20 ohm Initial Forward Current Pulse = 0.5 A, 0.1 to 1 msec. wide. $T_C = +25^\circ\text{C}$ $T_C = -40^\circ\text{C}$
Critical Rate of Rise of Forward Blocking Voltage. (Higher values may cause device switching.)	dv/dt	100†	—	Volts/ $\mu\text{sec}$	$T_C = +125^\circ\text{C}, \text{Rated } V_{DRM}, \text{Gate open circuited.}$
Thermal Resistance	$\Theta_{J-C}$	—	1.5†	$^\circ\text{C/watt}$	Junction-to-case, dc

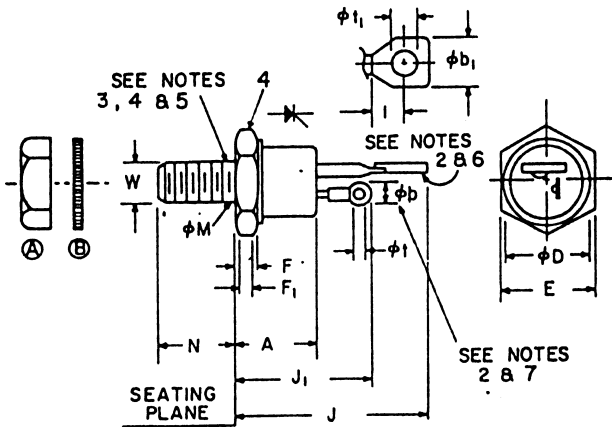


## OUTLINE DRAWING

(COMPLIES WITH JEDEC TO-48)

**NOTES:**

1. Complete threads to extend within 2½ threads of seating plane. Diameter of unthreaded portion. 249" (6.32MM) Maximum, .220" (5.59MM) Minimum.
  2. Angular orientation of these terminals is undefined.
  3. ¼-28 UNF-2A. Maximum pitch diameter of plated threads shall be basic pitch diameter .2268" (5.76MM), minimum pitch diameter .2225" (5.66MM), reference: screw thread standards for Federal Service 1957, Handbook H28, 1957, P1.
  4. A chamfer (or undercut) on one or both ends of hexagonal portions is optional.
  5. Case is anode connection.
  6. Large terminal is cathode connection.
  7. Small terminal is gate connection.
  8. Insulating kit available upon request.
- A. ¼-28 steel nut, Ni. plated, .178 min. thk.  
 B. Ext. tooth lockwasher, steel, Ni. plated, .023 min. thk.



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.330	.505	8.38	12.83	
$\phi b$	.115	.140	2.92	3.56	2
$\phi b_1$	.210	.300	5.33	7.62	2
$\phi D$		.544		13.82	
E	.544	.562	13.82	14.27	
F	.113	.200	2.87	5.08	4
$F_1$	.060		1.52		
J		1.193		30.30	
$J_1$		.875		22.23	
I	.120		3.05		
$\phi M$					1
N	.422	.453	10.72	11.51	
$\phi I$	.060	.075	1.52	1.91	
$\phi I_1$	.125	.165	3.18	4.19	
W					3