New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

N5164 thru 2N5171 (SILICON)
N5164R thru 2N5171R

THYRISTORS
SILICON CONTROLLED RECTIFIERS

. . . designed for industrial and consumer applications such as power supplies, battery chargers, temperature, motor, light and welder controls.

- Supplied in Either Pressfit or Stud Package
- High Surge Current Rating — I_{TSM} = 240 Amp
- Low On State Voltage — 1.2 V (Typ) @ I_{TM} = 20 Amp
- Practical Level Triggering and Holding Characteristics
  10 mA (Typ) @ T_C = 25°C

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
*Peak Reverse Blocking Voltage (1)	V_{RRM}		Volts
2N5164,2N5168		50	
2N5165,2N5169		200	
2N5166,2N5170		400	
2N5167,2N5171		600	
*Non-repetitive Peak Reverse Blocking Voltage	V_{RSM}		Volts
2N5164,2N5168		75	
2N5165,2N5169		300	
2N5166,2N5170		500	
2N5167,2N5171		700	
Forward Current RMS	$I_{T(RMS)}$	20	Amp
Circuit Fusing Considerations (T_J = -40 to +100°C, t < 8.3 ms)	I^2t	235	A^2s
*Peak Forward Surge Current (One cycle, 60 Hz, T_J = -40 to +100°C)	I_{TSM}	240	Amp
*Peak Forward Gate Power	P_{GFM}	5.0	Watts
*Average Forward Gate Power	$P_{GF(AV)}$	0.5	Watt
*Peak Forward Gate Current	I_{GFM}	2.0	Amp
Peak Gate Voltage Forward (2)	V_{GFM}	10	Volts
Reverse	V_{GRM}	10	
*Operating Junction Temperature Range	T_J	-40 to +100	°C
*Storage Temperature Range	T_{stg}	-40 to +150	°C
Stud Torque (3) 2N5168-2N5171		30	in. lb.

THERMAL CHARACTERISTICS

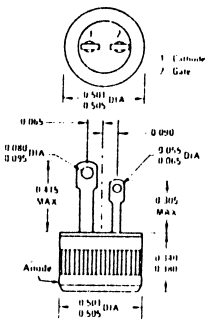
Characteristic	Symbol	Typ	Max	Unit
*Thermal Resistance, Junction	θ_{JC}			°C/W
to Case 2N5164,65,66,67		1.0	1.5	
2N5168,69,70,71		1.1	1.6	

*Indicates JEDEC Registered Data.

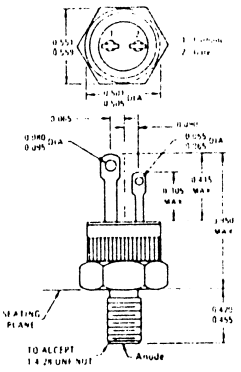
(1) V_{RRM} for all types can be applied on a continuous dc basis without incurring damage. Ratings apply for zero or negative gate voltage. Devices should not be tested for blocking capability in a manner such that the voltage applied exceeds the rated blocking voltage.

(2) Devices should not be operated with a positive bias applied to the gate concurrent with a negative potential applied to the anode.

(3) Reliable operation can be impaired if torque rating is exceeded, terminal tubes bent, or glass seal broken.



CASE 174 (1)



CASE 175 (1)

For "R Suffix devices: e.g., 2N5164R, the cathode and anode terminals are reversed.

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

Characteristic		Symbol	Min	Max	Unit
*Peak Forward Blocking Voltage (T_J = 100°C)	2N5164, 2N5168	V_{DRM}(1)	50	–	Volts
	2N5165, 2N5169		200	–	
	2N5166, 2N5170		400	–	
	2N5167, 2N5171		600	–	
*Peak Forward Blocking Current (Rated V_{DRM} @ T_J = 100°C, gate open)		I_{DRM}	–	5.0	mA
Peak Reverse Blocking Current (Rated V_{RRM} @ T_J = 100°C, gate open)		I_{RRM}	–	5.0	mA
Gate Trigger Current (Continuous dc)		I_{GT}(2)			mA
(Anode Voltage = 7.0 Vdc, R_L = 100 Ω)			–	40	
*(Anode Voltage = 7.0 Vdc, R_L = 100 Ω, T_C = -40°C)			–	75	
Gate Trigger Voltage (Continuous dc)		V_{GT}			Volts
(Anode Voltage = 7.0 Vdc, R_L = 100 Ω)			–	1.5	
*(Anode Voltage = 7.0 Vdc, R_L = 100 Ω, T_C = -40°C)			–	2.5	
*(Anode Voltage = Rated V_{DRM}, R_L = 100 Ω, T_J = 100°C)		V_{GD}	0.2		
Forward "ON" Voltage (pulsed, 1.0 ms max, duty cycle ≤ 1%)		V_{TM}			Volts
(I_{TM} = 20 A)			–	1.5	
(I_{TM} = 41 A)			–	1.7	
Holding Current		I_H			mA
(Anode Voltage = 7.0 Vdc, gate open)			–	50	
*(Anode Voltage = 7.0 Vdc, gate open, T_C = -40°C)			–	90	
Turn-On Time (t_d + t_r)			TYPICAL		
(I_{TM} = 20 A, I_{GT} = 40 mAdc)		t_{on}	1.0		µs
Turn-Off Time		t_{off}			µs
(I_{TM} = 10 A, I_R = 10 A)			20		
(I_{TM} = 10 A, I_R = 10 A, T_J = 100°C)			30		
(V_{DRM} = rated voltage)					
(dv/dt = 30 V/µs)					
Forward Voltage Application Rate (Gate open, T_J = 100°C)		dv/dt	50		V/µs

*Indicates JEDEC Registered Data.

(1) V_{DRM} for all types can be applied on a continuous dc basis without incurring damage. Ratings apply for zero or negative gate voltage. These devices should not be tested with a constant current source for forward or reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.

(2) For optimum operation, i.e. faster turn-on, lower switching losses, best di/dt capability, recommended I_{GT} = 200 mA.