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N5164 thru 2N5171 (SILICON)

N5164R thru 2N5171R

MAXIMUM RATINGS

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
*Thermal Resistance, Junction to Case	θ_{JC}	1.0 1.1	1.5 1.6	$^\circ C/W$

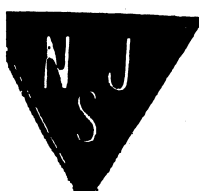
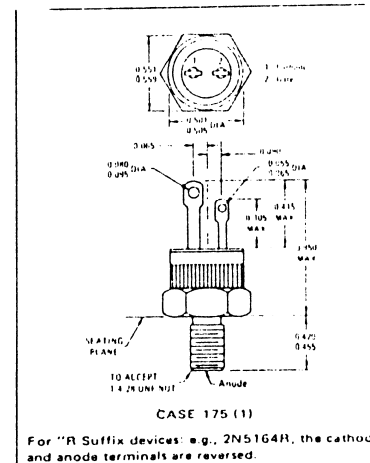
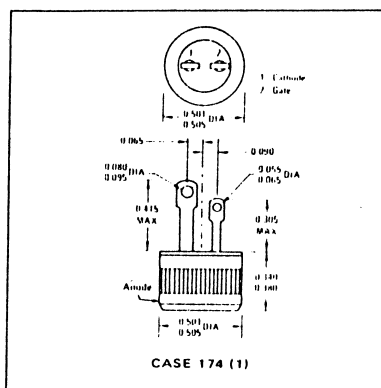
*Indicates JEDEC Registered Data.

- (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.

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) @ $I_T = 20$ Amp
- Practical Level Triggering and Holding Characteristics 10 mA (Typ) @ $T_C = 25^\circ C$



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

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

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

* 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 $I_{GT} = 200\ \text{mA}$.