## New Jersey Semi-Conductor Products, Inc.

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• Fourth lead completely eliminates rate effects (dv/dt)

- Dynamic and static breakover voltages are equal
- 40 and 100 volt ratings

- Characterized at temperature extremes
- Low cost
- TO-18 case

absolute maximum ratings:" (25°C)	<b>)</b> (unless	s otherw	ise specified)	DIMENSIONS WITHIN 230
Voltage	3N84	3N85		JEDEC OUTLINE TO-IN TO
Anode to cathode forward and reverse	40	100	volts	EXCEPT FOR
Anode gate to anode reverse	40	100	volts	LEAD CONFIGURATION
Cathode gate to cathode reverse	Š	5	volts	
Total Current	Ū	Ü	V0103	MOTE 1. Lead diameter is controlled in the
Continuous DC forward <sup>(2)</sup>	105			zone between 050 and 250 from the seating plane Between 250 and end of lead a 0.030
Peak recurrent forward ( $T_A = 100^{\circ}$ C, $100 \mu sec.$	175	175	ma	max. of O21 is held MAX
pulse width, 1% duty cycle)				MOTE 2: Leads having maximum diameter
Pook non recurrent former d (10	0.5	0.5	amps	(.019) measured in gaging plane 054 001 000 below the sealing plane of the device
Peak non-recurrent forward (10 µsec. pulse width)	2.0	2.0	amps	shall be within 007 of true position relation to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be within 007 of true position relations to the shall be shal
Gate Current (Forward Bias)				tive to a maximum width tab  MOTE 3: Measured from max diameter of
Continuous DC anode gate	10	10	ma	the actual device .
Peak anode gate $(T_A = 100^{\circ}\text{C}, 100 \mu\text{sec}.$				(NOTE 2) SEATING
pulse width, 1% duty cycle)	10	10	ma	PLANE
Peak cathode gate (T, = $100$ °C, $100 \mu sec$ .				(A) 9.4
pulse width, 1% duty cycle)	100	100	ma	$\downarrow \qquad (G_A) \qquad (3) \qquad (0)7 \qquad 000$
Continuous DC cathode gate	10	10	ma	ANODE (NOTE I)
Dissipation			1110	CATHODE CONNECTED INTERNALLY
Total power <sup>(2)</sup>	000	000		GATE 2 (C) 81 TO CASE
Cathode gate power <sup>(2)</sup>	320	320	mw	CATHODE .046
•	50	50	mw	048
Temperature				
Operating Junction	-55 to	+125	$^{\circ}\mathrm{C}$	ALL DIMEN. IN INCHES AND ARE (NOTE 3) REFERENCE UNLESS TOLERANCED
Storage	-65 to		°C	···
		, = • •		

lectrical characteristics:"						Typical Curve
CUTOFF CHARACTERISTICS	Symbol "	Temp.	3N84 (8)	3N8	<b>5</b> (a)	Fig. #
Forward Blocking Current	I <sub>B max</sub>	@ 25°C		.0	μa max	12
$(R_{cc} = 10K, V_{AC} = Rated Voltage)$	- D III II	@ 125°C		20	μa max	
Reverse Blocking Current	I <sub>R max</sub>	@ 25°C	1	.0	μa max	12
$(R_{GC} = 10K, V_{CA} = Rated Voltage)$		@ 125°C		20	μa max	
Cathode Gate Reverse Cutoff Current (at Rated Voltage)	I <sub>GC</sub>	@ 25°C	2	20	μa max	
Anode Gate Reverse Cutoff Current (at Rated Voltage)	IGA	@ 25°C	1	.0	μa max	<del></del>
CONDUCTING CHARACTERISTICS						
Forward Voltage	V <sub>F max</sub>	@ 25°C	1.9	1.9	V max	6, 7
(at 175ma Anode Current $R_{GC} = 10K$ )		@ −55°C	2.5	2.5	V max	٠, ٠
Holding Current	I <sub>H max</sub>	@ 25°C	2.0	2.0	ma max	8, 9, 11
$(R_{GC} = 10K)$		$\hat{a}$ -55°C	10	10	ma max	0, 0,
TRIGGERING CHARACTERISTICS						
Cathode Gate Current to Trigger <sup>(3)</sup>	IGTC max	@ 25°C	10	10	μa max	13
(I <sub>GTC</sub> from current source, $V_{AC} = 40V$ , $R_A = 800\Omega$ )		$@-55^{\circ}C$	100	100	μa max	
Cathode Gate Voltage to Trigger (3)	V <sub>GTC max</sub>	@ 25°C	.65	.65	V max	14
$(V_{AC} = 40V, R_A = 800\Omega,$		$@-55^{\circ}C$	1.0	1.0	V max	
$R_{GC} = 10K, R_{GA} = \infty$	V <sub>GTC min</sub>	@ 25°C	0.4	0.4	V min	
I <sub>GTC</sub> from current source)		@ 125°C	0.2	0.2	V min	
RANSIENT CHARACTERISTICS (3)					·····	
Tum-On Time	ton max	@ 25°C	1.5	1.5	μs max	3, 10
$(V_{AC} = 20V, I_A = 100ma, I_{GC} = 100 \mu a)$		@ −55°C	2.0	2.0	μs max	-,
Recovery Time (3)	tree max	@ 25°C	15	15	μs max	4, 5, 15, 16
$(V_{AC} = 20V, I_A = 100ma, R_{GC} = 10K)$		@ 125°C	25	25	μs max	-, -, 20, 20
Rate of Rise of Forward Blocking Voltage	dv/dt max	@ 25°C	See Note 4 V/µs 1		V/µs max	

OTE 1: Symbols and nomenclature are defined at the top of the next page.
OTE 2: Derate currents and power linearly to 125°C. The absolute maximum rating at any given temperature shall be in terms of the more conservative of the two parameters, i.e. current or power.
OTE 3: The 3N84 and 3N85 test conditions include a 220K resistor added

from the anode gate to the anode supply voltage. I s the only exception, the 220K resistor being deleted.

NOTE 4: The dv/dt rating is unlimited when the anode gate lead is returned to the anode voltage through a current limiting resistor. An example of this technique is shown in Figure 23.

