

# New Jersey Semi-Conductor Products, Inc.

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## 2N6116 Silicon Programmable Unijunction Transistor (PUT)

### SILICON PROGRAMMABLE UNIJUNCTION TRANSISTORS

... designed to enable the engineer to "program" unijunction characteristics such as R<sub>BB</sub>,  $\eta$ , I<sub>V</sub>, and I<sub>P</sub> by merely selecting two resistor values. Application includes thyristor-trigistor, oscillator, pulse and timing circuits. These devices may also be used in special thyristor applications due to the availability of an anode gate.

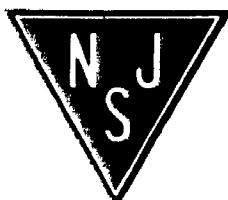
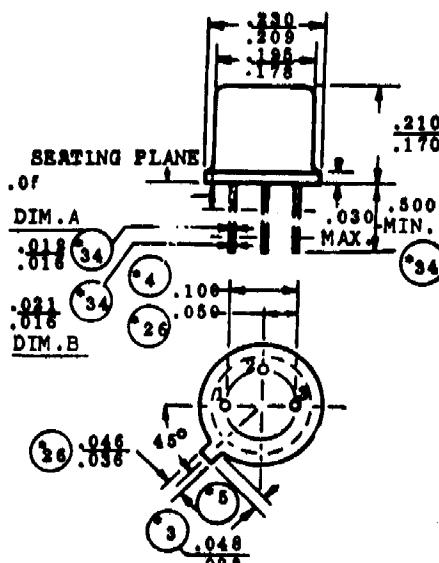
- Programmable - R<sub>BB</sub>,  $\eta$ , I<sub>V</sub> and I<sub>P</sub>
- Hermetic TO-18 Package
- Low On-State Voltage - 1.5 Volts Maximum @ I<sub>P</sub> = 50 mA
- Low Gate to Anode Leakage Current - 5.0 nA Maximum
- High Peak Output Voltage - 15 Volts Typical
- Low Offset Voltage - 0.35 Volt Typical (R<sub>G</sub> = 10 k ohms)

### \*MAXIMUM RATINGS

| Rating  | Symbol                            | Value       | Unit        |
|---|-----------------------------------|-------------|-------------|
| Repetitive Peak Forward Current<br>100 $\mu$ s Pulse Width, 1% Duty Cycle | I <sub>TRM</sub>                  | 1.0<br>2.0  | Amp<br>Amp  |
| Non Repetitive Peak Forward Current<br>10 $\mu$ s Pulse Width             | I <sub>TSM</sub>                  | 5.0         | Amp         |
| -DC Forward Anode Current<br>Derate Above 25°C                            | I <sub>T</sub>                    | 200<br>2.0  | mA<br>mA/°C |
| DC Gate Current   | I <sub>G</sub>                    | $\pm 20$    | mA          |
| Gate to Cathode Forward Voltage   | V <sub>GKF</sub>                  | 40          | ' Volt      |
| Gate to Cathode Reverse Voltage   | V <sub>GKR</sub>                  | 5.0         | ' Volt      |
| Gate to Anode Reverse Voltage   | V <sub>GAR</sub>                  | 40          | ' Volt      |
| Anode to Cathode Voltage  | V <sub>AK</sub>                   | $\pm 40$    | ' Volt      |
| Forward Power Dissipation @ T <sub>A</sub> = 25°C<br>Derate Above 25°C    | P <sub>F</sub><br>I <sub>FA</sub> | 250<br>2.5  | mW<br>mW/°C |
| Operating Junction Temperature Range                                      | T <sub>J</sub>                    | -55 to +125 | °C          |
| Storage Temperature Range   | T <sub>SIG</sub>                  | -55 to +200 | °C          |

\*Indicates JEDEC Registered Data

TO-18



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

| Characteristic  | Figure | Symbol    | Min        | Typ          | Max        | Unit          |
|---|--------|-----------|------------|--------------|------------|---------------|
| Offset Voltage<br>( $V_G = 10 \text{ Vdc}, R_G = 10 \text{ k ohms}$ )   | 1      | $V_T$     | 0.2<br>0.2 | 0.70<br>0.36 | 1.6<br>0.6 | Volts         |
| Gate to Anode Leakage Current<br>( $V_G = 40 \text{ Vdc}, T_A = 25^\circ\text{C}$ , Cathode Open)<br>( $V_G = 40 \text{ Vdc}, T_A = 75^\circ\text{C}$ , Cathode Open) | -      | $I_{GA0}$ | -<br>-     | 1.0<br>30    | 8.0<br>75  | nAdc          |
| Gate to Cathode Leakage Current<br>( $V_G = 40 \text{ Vdc}$ , Anode to Cathode Shorted)   | -      | $I_{GKS}$ | -          | 50           | 50         | nAdc          |
| Peak Current<br>( $V_G = 10 \text{ Vdc}, R_G = 10 \text{ k ohms}$ )   | 2,9,14 | $I_p$     | -<br>70    | 1.20<br>40   | 2.0<br>50  | $\mu\text{A}$ |
| Valley Current<br>( $V_G = 10 \text{ Vdc}, R_G = 10 \text{ M}\Omega$ )<br>( $V_G = 10 \text{ Vdc}, R_G = 10 \text{ k ohms}$ )   | 1,4,5  | $I_V$     | -<br>70    | 18<br>270    | 50<br>-    | $\mu\text{A}$ |
| Forward Voltage ( $I_F = 50 \text{ mA Peak}$ )  | 1,6    | $V_T$     | -          | 0.8          | 1.6        | Volts         |
| Peak Output Voltage<br>( $V_B = 20 \text{ Vdc}, C_C = 0.2 \mu\text{F}$ )  | 3,7    | $V_O$     | 60         | 16           | -          | Volts         |
| Pulse Voltage Rise Time<br>( $V_B = 20 \text{ Vdc}, C_C = 0.2 \mu\text{F}$ )  | 3      | $t_r$     | -          | 40           | 80         | ns            |

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