

New Jersey Semi-Conductor Products, Inc.

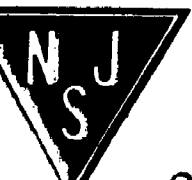
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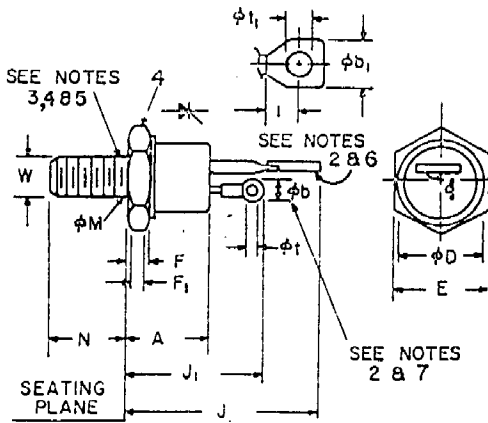
2N684

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

| Characteristic   | Symbol                 | Min  | Typ | Max  | Units                     |
|--|------------------------|------|-----|------|---------------------------|
| Peak Forward Blocking Voltage<br>( $T_J = 125^\circ\text{C}$ )   | $V_{DRM}$              | 150  | —   | —    | Volts                     |
| Peak Forward or Reverse Blocking Current<br>( $T_J = 125^\circ\text{C}$ )  | $I_{DRM}$<br>$I_{RRM}$ | —    | —   | 10.0 | mA                        |
| Gate Trigger Current (Continuous dc)<br>(Anode Voltage = 7 Vdc, $R_L = 50 \Omega$ )  | $I_{GT}$               | —    | 10  | 25   | mA                        |
| Gate Trigger Voltage (Continuous dc)<br>(Anode Voltage = 7 Vdc, $R_L = 50 \Omega$ )  | $V_{GT}$               | 0.25 | —   | 3.0  | Volts                     |
| Holding Current<br>(Anode Voltage = 7 Vdc, Gate Open)  | $I_H$                  | —    | 20  | —    | mA                        |
| Forward On Voltage<br>( $I_T = 20 \text{ Adc}$ )   | $V_{TM}$               | —    | 1.1 | 1.5  | Volts                     |
| Turn-On Time<br>( $I_T = 10 \text{ A}$ , $I_G = 200 \text{ mA}$ )  | $t_{gt}$               | —    | 1.0 | —    | $\mu\text{s}$             |
| Turn-Off Time <sup>1</sup><br>( $I_T = 10 \text{ A}$ ; $I_R = 10 \text{ A}$ , $dv/dt = 30 \text{ V}/\mu\text{s}$ min,<br>$T_J = 125^\circ\text{C}$ )<br>( $V_{DRM} = \text{rated voltage}$ ) | $t_q$                  | —    | 30  | —    | $\mu\text{s}$             |
| Forward Voltage Application Rate<br>(Gate open, $T_J = 125^\circ\text{C}$ )  | $dv/dt$                | —    | 30  | —    | $\text{V}/\mu\text{s}$    |
| Thermal Resistance (Junction to Case)  | $\theta_{JC}$          | —    | 1.0 | 2.0  | $^\circ\text{C}/\text{W}$ |



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| SYMBOL          | INCHES |       | MILLIMETERS |       | NOTES |
|-----------------|--------|-------|-------------|-------|-------|
|                 | MIN.   | MAX.  | MIN.        | MAX.  |       |
| A               | .330   | .505  | 8.38        | 12.83 |       |
| cb              | .115   | .140  | 2.92        | 3.56  | 2     |
| cb <sub>1</sub> | .210   | .300  | 5.33        | 7.62  | 2     |
| oD              |        | .544  |             | 13.82 |       |
| E               | .544   | .562  | 13.82       | 14.27 |       |
| F               | .113   | .200  | 2.87        | 5.08  | 4     |
| F <sub>1</sub>  | .060   |       | 1.52        |       |       |
| J               |        | 1.193 |             | 30.30 |       |
| J <sub>1</sub>  |        | .875  |             | 22.23 |       |
| I               | .120   |       | 3.05        |       |       |
| oM              |        |       |             |       | 1     |
| N               | .422   | .453  | 10.72       | 11.51 |       |
| oI              | .060   | .075  | 1.52        | 1.91  |       |
| oI <sub>1</sub> | .125   | .165  | 3.18        | 4.19  |       |
| W               |        |       |             |       | 3     |

NOTES:

- Complete threads to extend to within 2 1/2 threads of seating plane. Diameter of unthreaded portion .249" (6.32MM) Maximum, .220" (5.59MM) Minimum.
- Angular orientation of these terminals is undefined.
- 1/4-28 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.
- A chamfer (or undercut) on one or both ends of hexagonal portions is optional.
- Case is anode connection.
- Large terminal is cathode connection.
- Small terminal is gate connection.
- Insulating kit available upon request.
- 1/4-28 steel nut, Ni. plated, .178 min. thk.
- Ext. tooth lockwasher, steel, Ni. plated, .023 min. thk.



MAXIMUM RATINGS (T<sub>J</sub> = 125°C unless otherwise noted)

| Rating  | Symbol                      | Value       | Unit             |
|---|-----------------------------|-------------|------------------|
| Peak Reverse Blocking Voltage* †  | V <sub>RSM(rep)</sub> * †   | 150         | Volts            |
| Peak Reverse Blocking Voltage* (Transient) (non-recurrent t = 5 ms max.)      | V <sub>RSM(non-rep)</sub> * | 225         | Volts            |
| Forward Current RMS (all conduction angles)                                   | I <sub>F</sub>              | 25          | Amp              |
| Peak Forward Surge Current (One cycle, 60 Hz, T <sub>J</sub> = -65 to +125°C) | T <sub>TSM</sub>            | 200         | Amp              |
| Circuit Fusing Considerations (T <sub>J</sub> = -65 to +125°C, t ≥ 8.3 ms)    | I <sup>2</sup> t            | 165         | A <sup>2</sup> s |
| Peak Gate Power-Forward   | P <sub>GM</sub>             | 5.0         | Watts            |
| Average Gate Power-Forward  | P <sub>G(AV)</sub>          | 0.5         | Watt             |
| Peak Gate Current-Forward   | I <sub>GM</sub>             | 2.0         | Amp              |
| Peak Gate Voltage-Forward   | V <sub>GFM</sub>            | 10          | Volts            |
| Reverse   | V <sub>GRM</sub>            | 5.0         | Volts            |
| Operating Junction Temperature Range  | T <sub>J</sub>              | -65 to +125 | °C               |
| Storage Temperature Range   | T <sub>stg</sub>            | -65 to +150 | °C               |
| Stud Torque   | —                           | 30          | in. lb.          |

† V<sub>RSM</sub> for all types can be applied on a continuous dc basis without incurring change.

\* V<sub>RSM(rep)</sub> ratings apply for zero or negative gate voltage.