



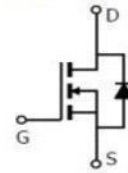
## 3N80 N-Channel Power MOSFET

### General Description

This advanced high voltage MOSFET is designed to withstand High energy in the avalanche mode and switch mode and switch efficiently. This new High energy device also offers a drain-to-source diode with fast Recovery time. Designed for high voltage, high speed switching Applications such as power supplies, converters, power motor controls and bridge circuits.

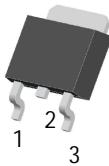
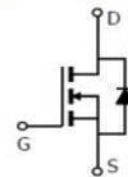
### T0-251

1. GATE
2. DRAIN
3. SOURCE



### T0-252

1. GATE
2. DRAIN
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### FEATURE

- High Current Rating
- Lower  $R_{ds(on)}$
- Lower Capacitance
- Lower Total Gate Charge
- Tighter VSD Specifications
- Avalanche Energy Specified

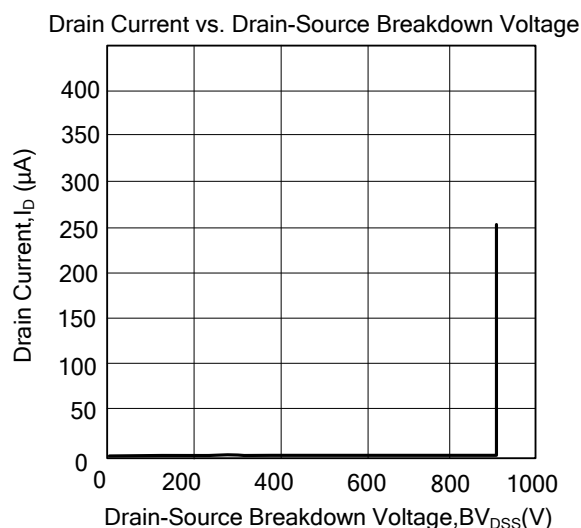
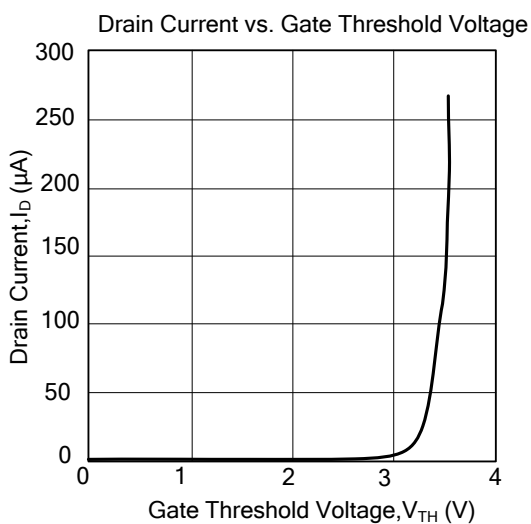
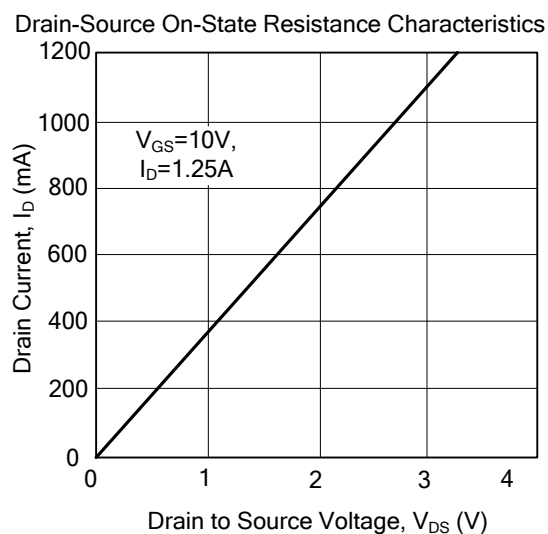
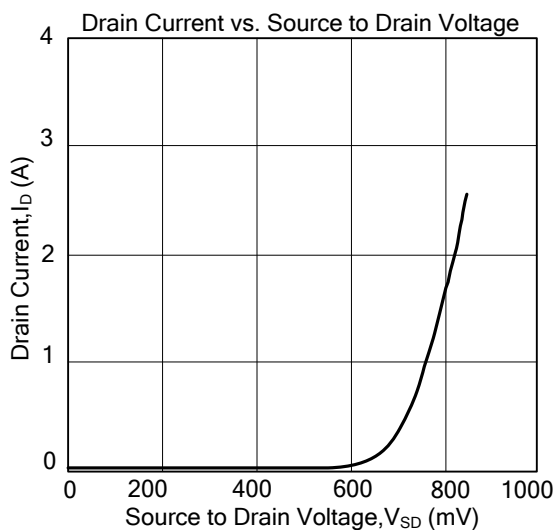
### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter   | Symbol          | Value      | Unit               |
|---|-----------------|------------|--------------------|
| Drain-Source Voltage  | $V_{DS}$        | 800        | V                  |
| Gate-Source Voltage   | $V_{GSS}$       | $\pm 30$   |                    |
| Continuous Drain Current  | $I_D$           | 3          | A                  |
| Continuous Drain-Source Diode Forward Current                                     | $I_S$           | 3          |                    |
| Single Pulsed Avalanche Energy (note1)  | $E_{AS}$        | 175        | mJ                 |
| Thermal Resistance from Junction to Ambient                                       | $R_{\theta JA}$ | 100        | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range   | $T_J, T_{STG}$  | -55 ~ +150 | $^\circ\text{C}$   |
| Maximum lead temperature for soldering purposes ,<br>1/8" from case for 5 seconds | $T_L$           | 260        |                    |

## Electrical characteristics ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                                 | Symbol        | Test Condition  | Min | Typ | Max  | Unit     |
|---|---------------|---|-----|-----|------|----------|
| <b>Off characteristics</b>                |               |   |     |     |      |          |
| Drain-source breakdown voltage            | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                                   |     |     | 800  | V        |
| Drain-source diode forward voltage(note2) | $V_{SD}$      | $V_{GS} = 0V, I_S = 3.0A$                                       |     |     | 1.5  |          |
| Zero gate voltage drain current           | $I_{DSS}$     | $V_{DS} = 800V, V_{GS} = 0V$                                    |     |     | 25   | $\mu A$  |
| Gate-body leakage current, forward(note2) | $I_{GSSF}$    | $V_{DS} = 0V, V_{GS} = 30V$                                     |     |     | 100  | nA       |
| Gate-body leakage current, reverse(note2) | $I_{GSSR}$    | $V_{DS} = 0V, V_{GS} = -30V$                                    |     |     | -100 |          |
| <b>On characteristics (note2)</b>         |               |   |     |     |      |          |
| Gate-threshold voltage                    | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                               | 2.0 |     | 4.0  | V        |
| Static drain-source on-resistance         | $R_{DS(on)}$  | $V_{GS} = 10V, I_D = 1.5A$                                      |     | 3.8 | 4.5  | $\Omega$ |
| Forward transconductance                  | $g_{fs}$      | $V_{DS} = 50V, I_D = 2A$  | 2.0 | 2.6 |      | S        |
| <b>Dynamic characteristics (note 3)</b>   |               |   |     |     |      |          |
| Input capacitance                         | $C_{iss}$     | $V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$                           |     | 540 | 760  | pF       |
| Output capacitance                        | $C_{oss}$     |   |     | 125 | 180  |          |
| Reverse transfer capacitance              | $C_{rss}$     |   |     | 8.0 | 20   |          |
| <b>Switching characteristics</b>          |               |   |     |     |      |          |
| Total gate charge                         | $Q_g$         | $V_{DS} = 480V, V_{GS} = 10V, I_D = 4.0A$                       |     | 5.0 | 10   | nC       |
| Gate-source charge                        | $Q_{gs}$      |   |     | 2.7 |      |          |
| Gate-drain charge                         | $Q_{gd}$      |   |     | 2.0 |      |          |
| Turn-on delay time (note3)                | $t_{d(on)}$   | $V_{DD} = 300V, V_{GS} = 10V,$<br>$R_G = 9.1\Omega, I_D = 4.0A$ |     | 12  | 20   | ns       |
| Turn-on rise time (note3)                 | $t_r$         |   |     | 7.0 | 10   |          |
| Turn-off delay time (note3)               | $t_{d(off)}$  |   |     | 19  | 40   |          |
| Turn-off fall time (note3)                | $t_f$         |   |     | 10  | 20   |          |

■ TYPICAL CHARACTERISTICS



Max. Safe Operating Area

