

## 2.5A,800V N-Channel Power Mosfet

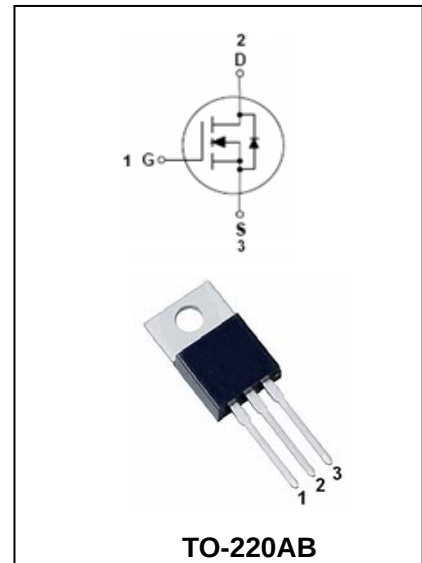
BL3N80

### FEATURES

- $R_{DS(ON)} = 3.8\Omega @ V_{GS} = 10V$
- Ultra low gate charge ( typical 19 nC )
- Low reverse transfer Capacitance (  $CRSS = \text{typical } 11 \text{ pF}$  )
- Fast switching capability
- Avalanche energy specified
- Improved dv/dt capability, high ruggedness



Lead-free



### MAXIMUM RATING @ $T_a = 25^\circ\text{C}$ unless otherwise specified

| Symbol             | Parameter                              | Value       | Units                     |
|--------------------|----------------------------------------|-------------|---------------------------|
| $V_{DSS}$          | Drain-Source voltage                   | 800         | V                         |
| $V_{GSS}$          | Gate -Source voltage                   | $\pm 30$    | V                         |
| $I_D$              | Continuous Drain Current               | 2.5         | A                         |
| $I_{DM}$           | Pulsed Drain Current                   | 10          | A                         |
| $E_{AS}$           | Avalanche Energy Single Pulsed         | 170         | mJ                        |
| dv/dt              | Peak Diode Recovery dv/dt              | 4.5         | V/ns                      |
| $P_D$              | Power Dissipation                      | 70          | W                         |
| $R_{\theta JA}$    | Thermal resistance,Junction-to-Ambient | 62.5        | $^\circ\text{C}/\text{W}$ |
| $T_J$              | Junction Temperature                   | +150        | $^\circ\text{C}$          |
| $T_{OPR}, T_{stg}$ | Operating and Storage Temperature      | -55 to +150 | $^\circ\text{C}$          |

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### ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

| Parameter                                             | Symbol              | Test conditions                                                                                       | MIN | TYP  | MAX  | UNIT |
|-------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------|-----|------|------|------|
| OFF CHARACTERISTICS                                   |                     |                                                                                                       |     |      |      |      |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                            | 800 | -    | -    | V    |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =800V, V <sub>GS</sub> =0V                                                            | -   | -    | 1    | μA   |
| Gate-body Leakage                                     | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> = ± 30V                                                          | -   | -    | ± 10 | μA   |
| ON CHARACTERISTICS                                    |                     |                                                                                                       |     |      |      |      |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                              | 3   | 3.75 | 4.5  | V    |
| Static drain-Source on-resistance                     | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =1.25A                                                           | -   | 3.8  | 4.5  | Ω    |
| Forward Transconductance                              | gF <sub>s</sub>     | V <sub>DS</sub> =15V, I <sub>D</sub> =1.25A                                                           | -   | 2.1  | -    | S    |
| DYNAMIC CHARACTERISTICS                               |                     |                                                                                                       |     |      |      |      |
| Input capacitance                                     | C <sub>ISS</sub>    | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz                                                   | -   | 485  | -    | pF   |
| Output capacitance                                    | C <sub>OSS</sub>    |                                                                                                       | -   | 57   | -    |      |
| Reverse transfer capacitance                          | C <sub>RSS</sub>    |                                                                                                       | -   | 11   | -    |      |
| SWITCHING CHARACTERISTICS                             |                     |                                                                                                       |     |      |      |      |
| Turn-On Delay Time                                    | t <sub>D(ON)</sub>  | V <sub>DD</sub> = 400V,<br>I <sub>D</sub> = 1.25A,<br>R <sub>G</sub> = 4.7Ω,<br>V <sub>GS</sub> = 10V | -   | 17   | -    | ns   |
| Rise Time                                             | tr                  |                                                                                                       | -   | 27   | -    | ns   |
| Turn-Off Delay Time                                   | t <sub>D(OFF)</sub> |                                                                                                       | -   | 36   | -    | ns   |
| Fall Time                                             | tf                  |                                                                                                       | -   | 40   | -    | ns   |
| Total Gate Charge                                     | Qg                  | V <sub>DS</sub> = 640V<br>I <sub>D</sub> = 2.5A<br>V <sub>GS</sub> = 10V,                             | -   | 19   | -    | nC   |
| Gate–Source Charge                                    | Qgs                 |                                                                                                       | -   | 3.2  | -    | nC   |
| Gate–Drain Charge                                     | Qgd                 |                                                                                                       | -   | 10.8 | -    | nC   |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS       |                     |                                                                                                       |     |      |      |      |
| Drain-Source diode forward voltage                    | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>s</sub> =2.5A                                                             | -   | -    | 1.6  | V    |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      |                                                                                                       | -   | -    | 2.5  | A    |
| Maximum Pulsed Drain-Source Diode Forward Current     | I <sub>SM</sub>     |                                                                                                       | -   | -    | 10   | A    |
| Body Diode Reverse Recovery Time                      | trr                 | V <sub>GS</sub> =0V ,I <sub>s</sub> =2.5A,<br>dI/dt=100A/μ s                                          | -   | 384  | -    | nS   |
| Body Diode Reverse Recovery Charge                    | Qrr                 |                                                                                                       | -   | 1600 | -    | nC   |

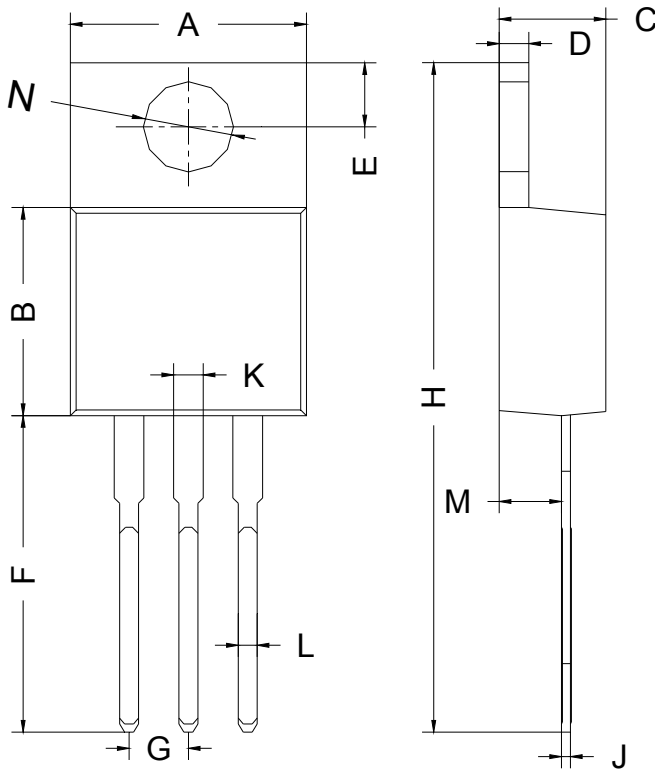
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### PACKAGE OUTLINE

Plastic surface mounted package

TO-220AB



| TO-220AB             |              |       |
|----------------------|--------------|-------|
| Dim                  | Min          | Max   |
| A                    | 9.80         | 10.30 |
| B                    | 8.70         | 9.10  |
| C                    | 4.57 Typical |       |
| D                    | 1.27 Typical |       |
| E                    | 2.64         | 2.84  |
| F                    | 13.14        | 13.74 |
| G                    | 2.44         | 2.64  |
| H                    | 28.03        | 28.83 |
| J                    | 0.38 Typical |       |
| K                    | 1.22         | 1.32  |
| L                    | 0.71         | 0.91  |
| M                    | 2.50 Typical |       |
| N                    | 3.86 Typical |       |
| All Dimensions in mm |              |       |