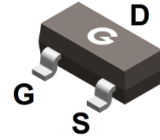
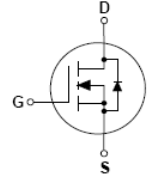


### Features

- Advanced trench technology
- Super low gate charge
- Fast switching speed
- RoHS compliant with Halogen-free

**HF**



**SOT-23**

### Mechanical Data

- Case: SOT-23
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

### Ordering Information

| Part Number | Package | Shipping Quantity      | Marking Code |
|-------------|---------|------------------------|--------------|
| BL800N06    | SOT-23  | 3000 pcs / Tape & Reel | 800N06       |

### Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                                                                 | Symbol    | Value           | Unit             |
|---------------------------------------------------------------------------|-----------|-----------------|------------------|
| Drain-to-Source Voltage                                                   | $V_{DS}$  | 60              | V                |
| Gate-to-Source Voltage                                                    | $V_{GS}$  | $\pm 20$        | V                |
| Continuous Drain Current ( $T_A = 25^\circ\text{C}$ ) <sup>*1</sup>       | $I_D$     | 3               | A                |
| Continuous Drain Current ( $T_A = 70^\circ\text{C}$ ) <sup>*1</sup>       |           | 2.4             |                  |
| Pulsed Drain Current ( $t_p = 10\mu\text{s}$ , $T_A = 25^\circ\text{C}$ ) | $I_{DM}$  | 30              | A                |
| Single Pulse Avalanche Energy ( $L = 0.5\text{mH}$ ) <sup>*3</sup>        | $E_{AS}$  | 10              | mJ               |
| Power Dissipation ( $T_A = 25^\circ\text{C}$ ) <sup>*1</sup>              | $P_D$     | 1.5             | W                |
| Operating Junction Temperature Range                                      | $T_J$     | $-55 \sim +150$ | $^\circ\text{C}$ |
| Storage Temperature Range                                                 | $T_{STG}$ | $-55 \sim +150$ | $^\circ\text{C}$ |

### Thermal Characteristics

| Parameter                                        | Symbol          | Min. | Typ. | Max. | Unit               |
|--------------------------------------------------|-----------------|------|------|------|--------------------|
| Thermal Resistance Junction-to-Air <sup>*1</sup> | $R_{\theta JA}$ | -    | -    | 83   | $^\circ\text{C/W}$ |

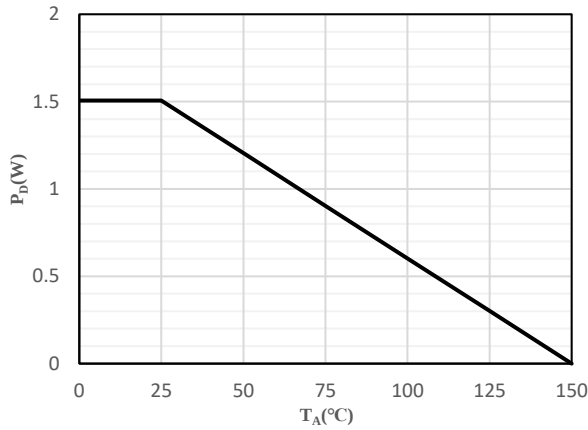
### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Symbol                             | Parameter                       | Test Condition                                                                              | Min. | Typ. | Max. | Unit |
|------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics             |                                 |                                                                                             |      |      |      |      |
| V <sub>DSS</sub>                   | Drain-Source Breakdown Voltage  | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                | 60   | -    | -    | V    |
| I <sub>DSS</sub>                   | Zero Gate Voltage Drain Current | V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V                                                 | -    | -    | 1    | μA   |
| I <sub>GSS</sub>                   | Gate-Body Leakage Current       | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                | -    | -    | ±100 | nA   |
| On Characteristics                 |                                 |                                                                                             |      |      |      |      |
| R <sub>DS(ON)</sub>                | Drain-Source On-resistance *2   | V <sub>GS</sub> = 10V,I <sub>D</sub> = 3A                                                   | -    | 60   | 80   | mΩ   |
|                                    |                                 | V <sub>GS</sub> = 4.5V,I <sub>D</sub> = 2A                                                  | -    | 70   | 95   |      |
| V <sub>GS(th)</sub>                | Gate Threshold Voltage          | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                  | 1    | 1.4  | 2    | V    |
| R <sub>G</sub>                     | Gate Resistance                 | V <sub>GS</sub> = 0V, f = 1MHz                                                              | -    | 3    | -    | Ω    |
| Dynamic Characteristics            |                                 |                                                                                             |      |      |      |      |
| C <sub>ISS</sub>                   | Input Capacitance               | V <sub>GS</sub> = 0V<br>V <sub>DS</sub> = 25V<br>f = 1.0MHz                                 | -    | 432  | -    | pF   |
| C <sub>OSS</sub>                   | Output Capacitance              |                                                                                             | -    | 30   | -    |      |
| C <sub>RSS</sub>                   | Reverse Transfer Capacitance    |                                                                                             | -    | 24   | -    |      |
| Switching Characteristics          |                                 |                                                                                             |      |      |      |      |
| t <sub>d(ON)</sub>                 | Turn-on Delay Time *4           | V <sub>DD</sub> =30V<br>V <sub>GS</sub> = 10V<br>I <sub>D</sub> = 3A<br>R <sub>G</sub> = 3Ω | -    | 4    | -    | ns   |
| t <sub>r</sub>                     | Turn-on Rise Time *4            |                                                                                             | -    | 2    | -    |      |
| t <sub>d(OFF)</sub>                | Turn-Off Delay Time *4          |                                                                                             | -    | 13.3 | -    |      |
| t <sub>f</sub>                     | Turn-Off Fall Time *4           |                                                                                             | -    | 1.6  | -    |      |
| Q <sub>G</sub>                     | Total Gate-Charge               | V <sub>DD</sub> = 30V<br>V <sub>GS</sub> = 10V<br>I <sub>D</sub> = 3A                       | -    | 8.8  | -    | nC   |
| Q <sub>GS</sub>                    | Gate to Source Charge           |                                                                                             | -    | 1.3  | -    |      |
| Q <sub>GD</sub>                    | Gate to Drain (Miller) Charge   |                                                                                             | -    | 2.1  | -    |      |
| Source-Drain Diode Characteristics |                                 |                                                                                             |      |      |      |      |
| V <sub>SD</sub>                    | Diode Forward Voltage *2        | I <sub>SD</sub> = 3A, V <sub>GS</sub> = 0V<br>dI/dt = 100A/μs                               | -    | 0.8  | 1.2  | V    |
| t <sub>rr</sub>                    | Reverse Recovery Time           |                                                                                             | -    | 14   | -    | ns   |
| Q <sub>rr</sub>                    | Reverse Recovery Charge         |                                                                                             | -    | 9    | -    | nC   |

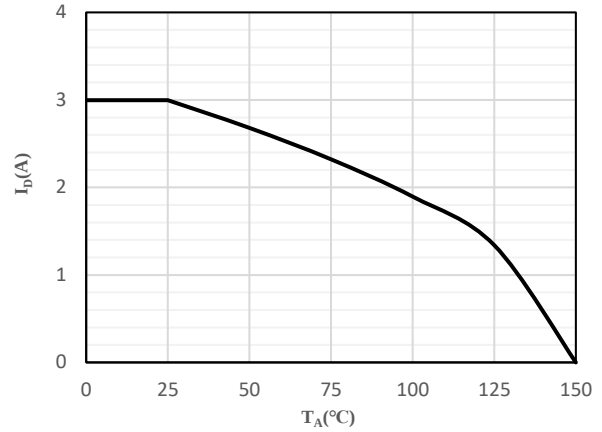
Notes:

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper
- The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- The  $E_{AS}$  data shows Max. rating. The test condition is  $V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH$
- Guaranteed by design, not subject to production

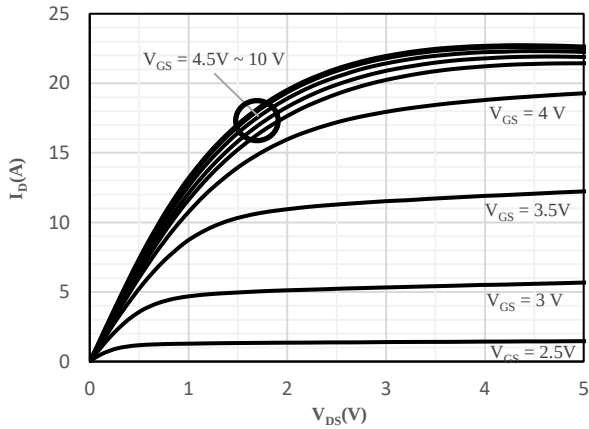
**Ratings and Characteristics Curves** (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)



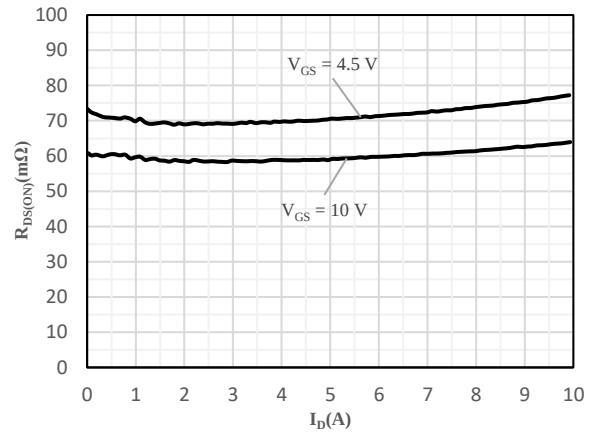
**Fig 1 Power Dissipation**



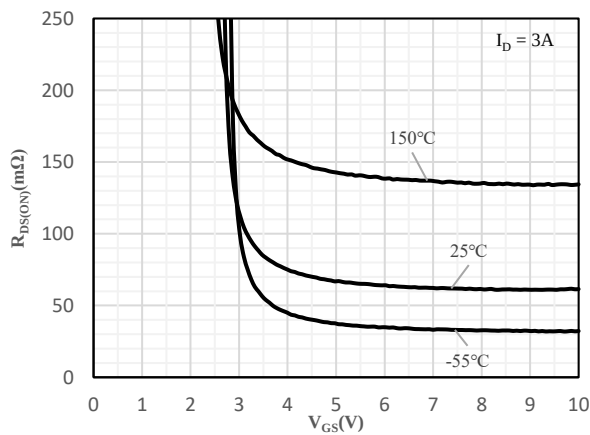
**Fig 2 Drain Current**



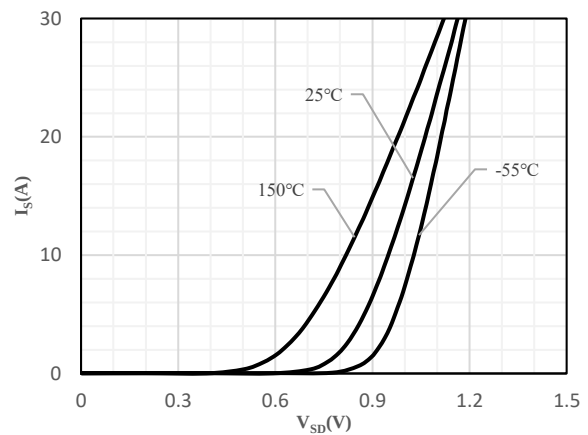
**Fig 3 Typical Output Characteristics**



**Fig 4 On-Resistance vs. Drain Current and Gate Voltage**



**Fig 5 On-Resistance vs. Gate-Source Voltage**



**Fig 6 Body-Diode Characteristics**

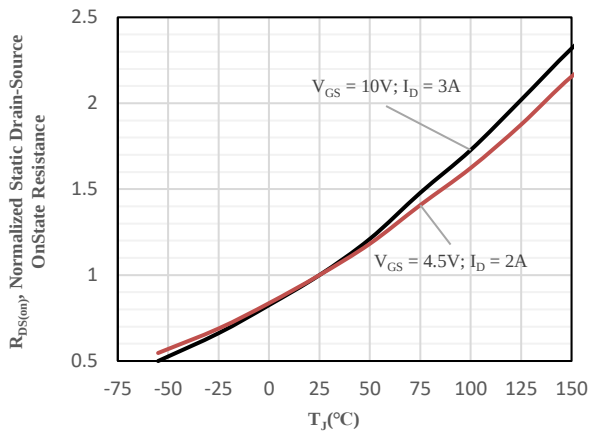


Fig 7 Normalized On-Resistance vs. Junction Temperature

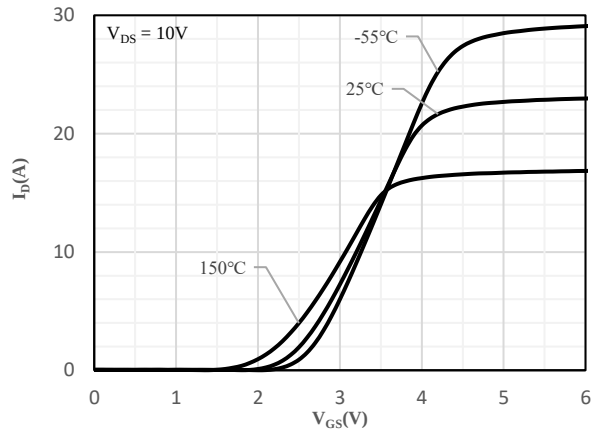


Fig 8 Transfer Characteristics

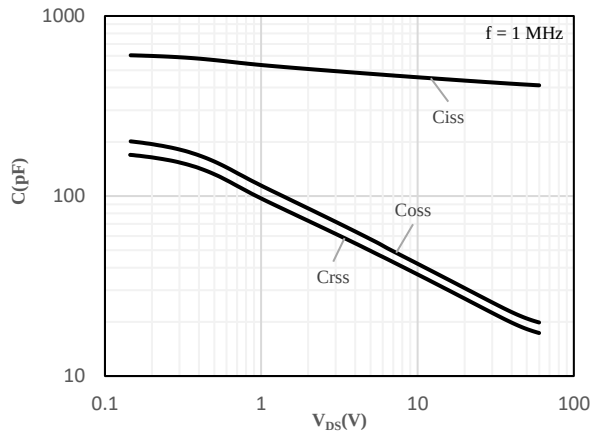


Fig 9 Capacitance Characteristics

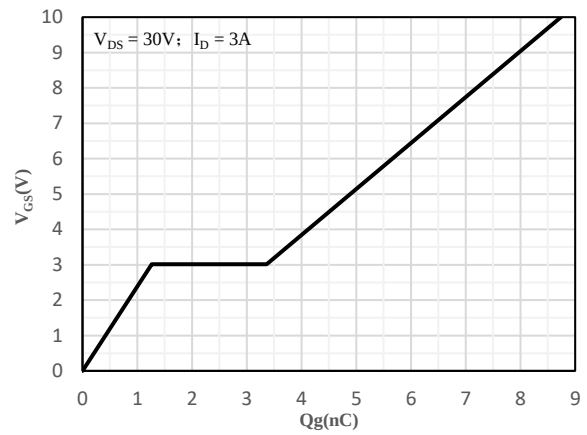


Fig 10 Gate-Charge Characteristics

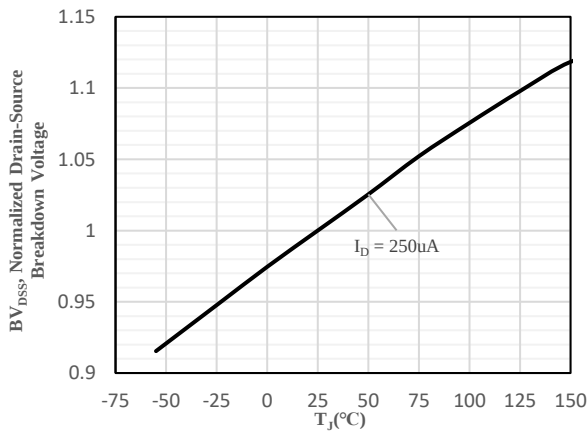


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

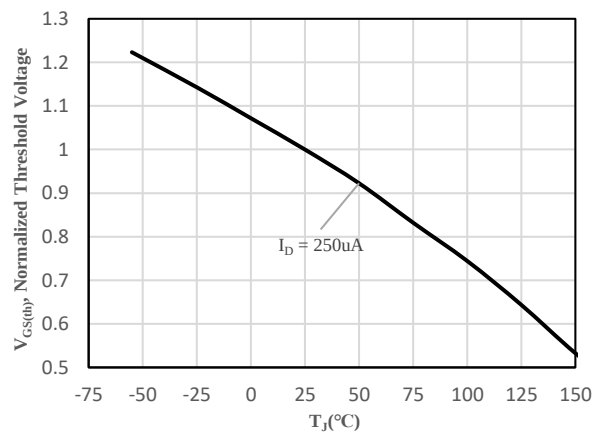
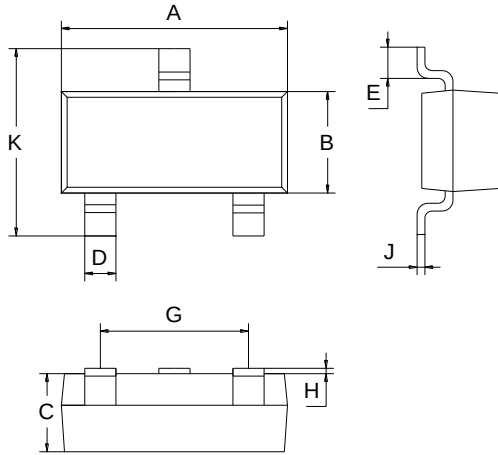


Fig 12 Normalized  $V_{GS(th)}$  vs. Junction Temperature

**Package Outline Dimensions** (Unit: mm)



| SOT-23    |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 2.70 | 3.10 |
| B         | 1.10 | 1.50 |
| C         | 0.90 | 1.10 |
| D         | 0.30 | 0.50 |
| E         | 0.35 | 0.48 |
| G         | 1.80 | 2.00 |
| H         | 0.02 | 0.10 |
| J         | 0.05 | 0.15 |
| K         | 2.20 | 2.60 |

**Mounting Pad Layout** (Unit: mm)

**SOT-23**

