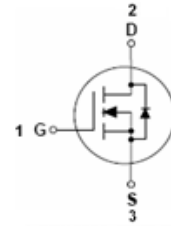


### Features

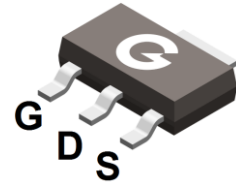
- Super low gate charge
- Green device available
- Excellent  $C_{dv}/d_t$  effect decline
- Advanced high cell density trench technology
- RoHS compliant with Halogen-free

HF



### Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



SOT-223

### Mechanical Data

- Case: SOT-223
- 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 |
|-------------|---------|------------------------|--------------|
| BL2N60R     | SOT-223 | 4000 pcs / Tape & Reel | 2N60         |

## Maximum Ratings

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

| Parameter  | Symbol    | Value    | Unit |
|--|-----------|----------|------|
| Drain-to-Source Voltage                                | $V_{DSS}$ | 600      | V    |
| Gate-to-Source Voltage                                 | $V_{GSS}$ | $\pm 30$ | V    |
| Continuous Drain Current                               | $I_D$     | 2        | A    |
| Continuous Drain Current ( $T_A = 100^\circ\text{C}$ ) |           | 1.26     | A    |
| Pulsed Drain Current                                   | $I_{DM}$  | 8        | A    |
| Single Pulse Avalanche Energy <sup>*1</sup>            | $E_{AS}$  | 75       | mJ   |

## Thermal Characteristics

| Parameter                                      | Symbol          | Value      | Unit               |
|--|-----------------|------------|--------------------|
| Power Dissipation ( $T_A = 25^\circ\text{C}$ ) | $P_D$           | 3          | W                  |
| Thermal Resistance Junction-to-Air             | $R_{\theta JA}$ | 41.7       | $^\circ\text{C/W}$ |
| Thermal Resistance Junction-to-Case            | $R_{\theta JC}$ | 6          | $^\circ\text{C/W}$ |
| Operating Junction Temperature Range           | $T_J$           | -55 ~ +150 | $^\circ\text{C}$   |
| Storage Temperature Range                      | $T_{STG}$       | -55 ~ +150 | $^\circ\text{C}$   |

### Electrical Characteristics

(@ T<sub>A</sub> = 25°C unless otherwise specified)

| Symbol                                    | Parameter                                       | Test Condition   | Min. | Typ. | Max. | Unit |
|---|---|--|------|------|------|------|
| <b>Static Characteristics</b>             |   |  |      |      |      |      |
| V <sub>DSS</sub>                          | Drain-Source Breakdown Voltage                  | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                             | 600  | -    | -    | V    |
| I <sub>DSS</sub>                          | Zero Gate Voltage Drain Current                 | V <sub>DS</sub> = 600V, V <sub>GS</sub> = 0V                             | -    | -    | 10   | μA   |
| I <sub>GSS</sub>                          | Gate-Body Leakage Current                       | V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V                             | -    | -    | ±100 | nA   |
| <b>On Characteristics</b>                 |   |  |      |      |      |      |
| R <sub>DS(ON)</sub>                       | Static Drain-Source On-resistance <sup>*2</sup> | V <sub>GS</sub> = 10V, I <sub>D</sub> = 1A                               | -    | 3.9  | 5    | Ω    |
| V <sub>GS(th)</sub>                       | Gate Threshold Voltage                          | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA               | 2    | 3    | 4    | V    |
| R <sub>G</sub>                            | Gate Resistance                                 | V <sub>GS</sub> = 0V, f = 1MHz   | -    | 23.6 | -    | Ω    |
| <b>Dynamic Characteristics</b>            |   |  |      |      |      |      |
| C <sub>ISS</sub>                          | Input Capacitance                               | V <sub>GS</sub> = 0V<br>V <sub>DS</sub> = 25V<br>f = 1.0MHz              | -    | 359  | -    | pF   |
| C <sub>OSS</sub>                          | Output Capacitance                              |  | -    | 48   | -    |      |
| C <sub>RSS</sub>                          | Reverse Transfer Capacitance                    |  | -    | 17   | -    |      |
| <b>Switching Characteristics</b>          |   |  |      |      |      |      |
| t <sub>d(ON)</sub>                        | Turn-on Delay Time                              | V <sub>DD</sub> = 300V<br>R <sub>G</sub> = 25Ω<br>I <sub>D</sub> = 2.4A  | -    | 10   | -    | ns   |
| t <sub>r</sub>                            | Turn-on Rise Time                               |  | -    | 25   | -    |      |
| t <sub>d(OFF)</sub>                       | Turn-Off Delay Time                             |  | -    | 20   | -    |      |
| t <sub>f</sub>                            | Turn-Off Fall Time                              |  | -    | 25   | -    |      |
| Q <sub>G</sub>                            | Total Gate-Charge                               | V <sub>DD</sub> = 480V<br>V <sub>GS</sub> = 10V<br>I <sub>D</sub> = 2.4A | -    | 7.8  | -    | nC   |
| Q <sub>GS</sub>                           | Gate to Source Charge                           |  | -    | 1.7  | -    |      |
| Q <sub>GD</sub>                           | Gate to Drain (Miller) Charge                   |  | -    | 2.3  | -    |      |
| <b>Source-Drain Diode Characteristics</b> |   |  |      |      |      |      |
| V <sub>SD</sub>                           | Diode Forward Voltage <sup>*2</sup>             | I <sub>SD</sub> = 2A, V <sub>GS</sub> = 0V                               | -    | -    | 1.2  | V    |
| t <sub>rr</sub>                           | Reverse Recovery Time                           | I <sub>SD</sub> = 2.4A, V <sub>GS</sub> = 0V                             | -    | 503  | -    | ns   |
| Q <sub>rr</sub>                           | Reverse Recovery Charge                         | di/dt = 100A/μs  | -    | 1838 | -    | nC   |

**Notes:**

1. The E<sub>AS</sub> data shows Max. rating. The test condition is V<sub>DS</sub> = 50V, V<sub>GS</sub> = 10V, L = 70mH
1. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%

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

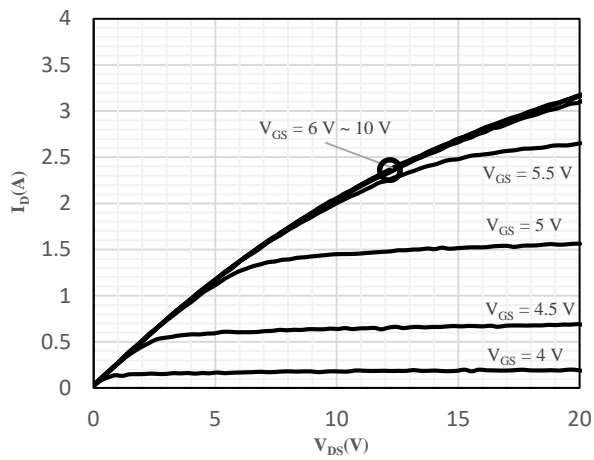


Fig 1 Typical Output Characteristics

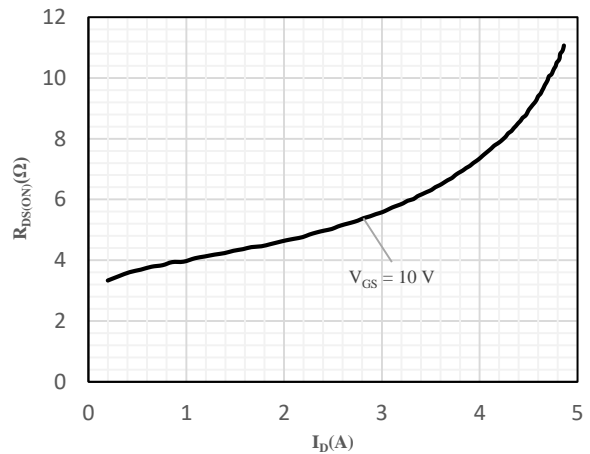


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

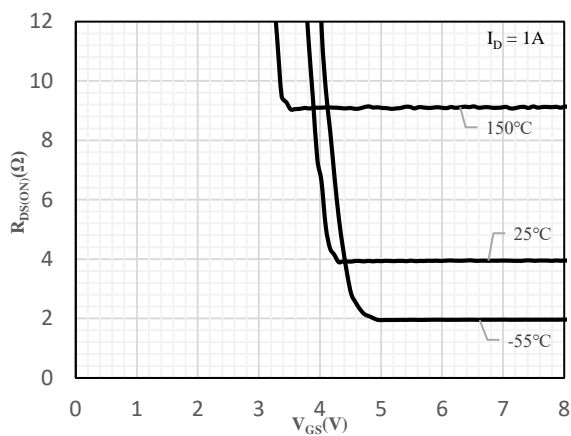


Fig 3 On-Resistance vs. Gate-Source Voltage

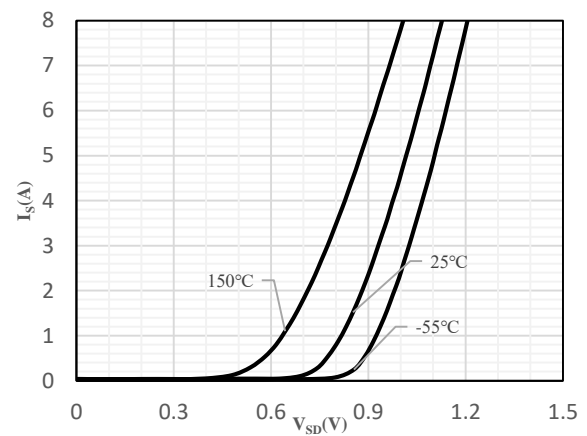


Fig 4 Body-Diode Characteristics

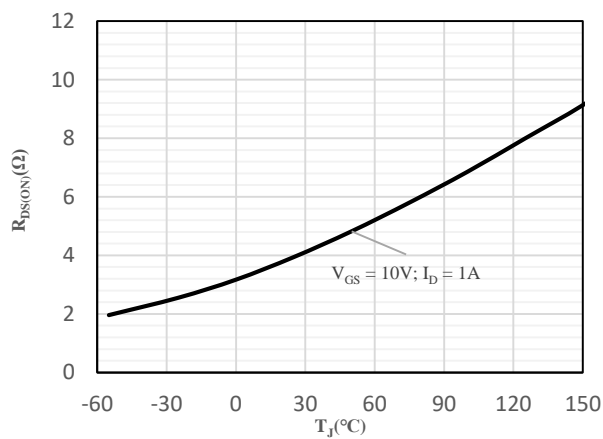


Fig 5 On-Resistance vs. Junction Temperature

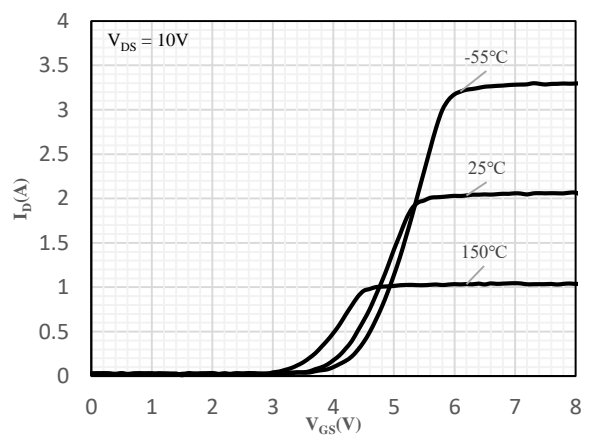


Fig 6 Transfer Characteristics

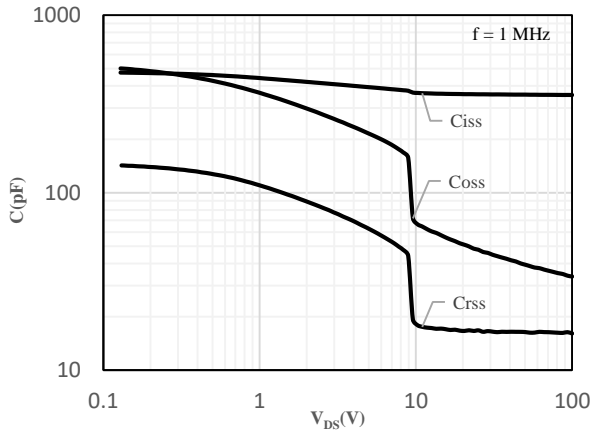


Fig 7 Capacitance Characteristics

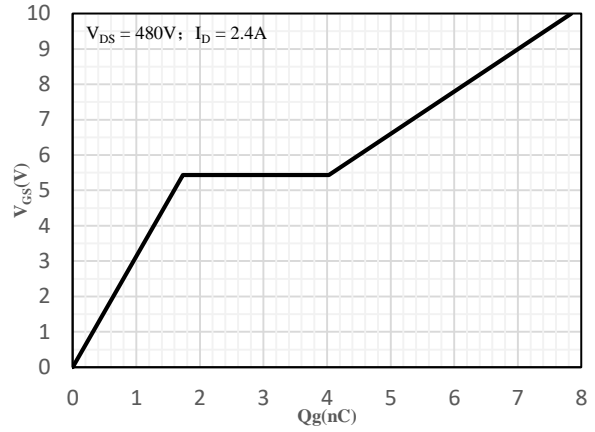


Fig 8 Gate-Charge Characteristics

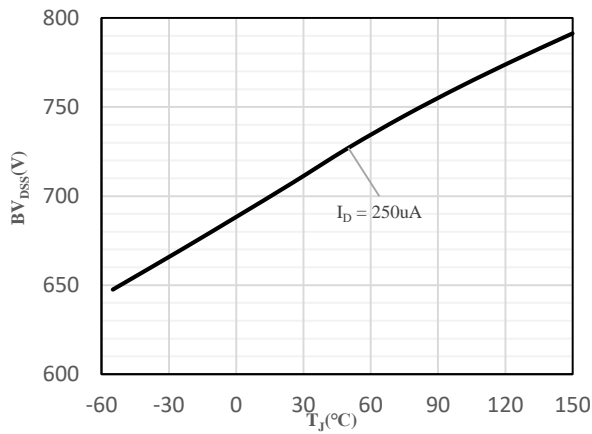


Fig 9 Breakdown Voltage vs. Junction  
Temperature

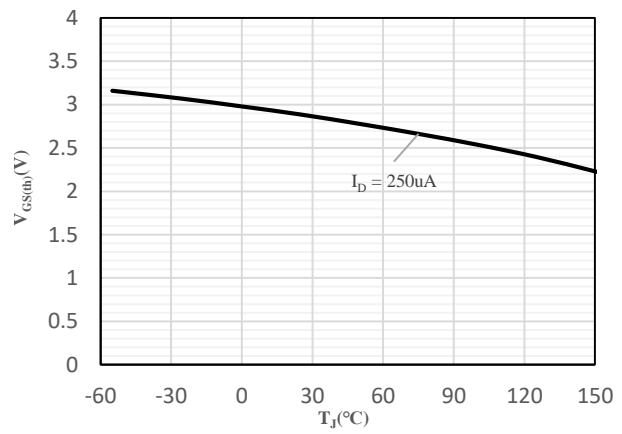
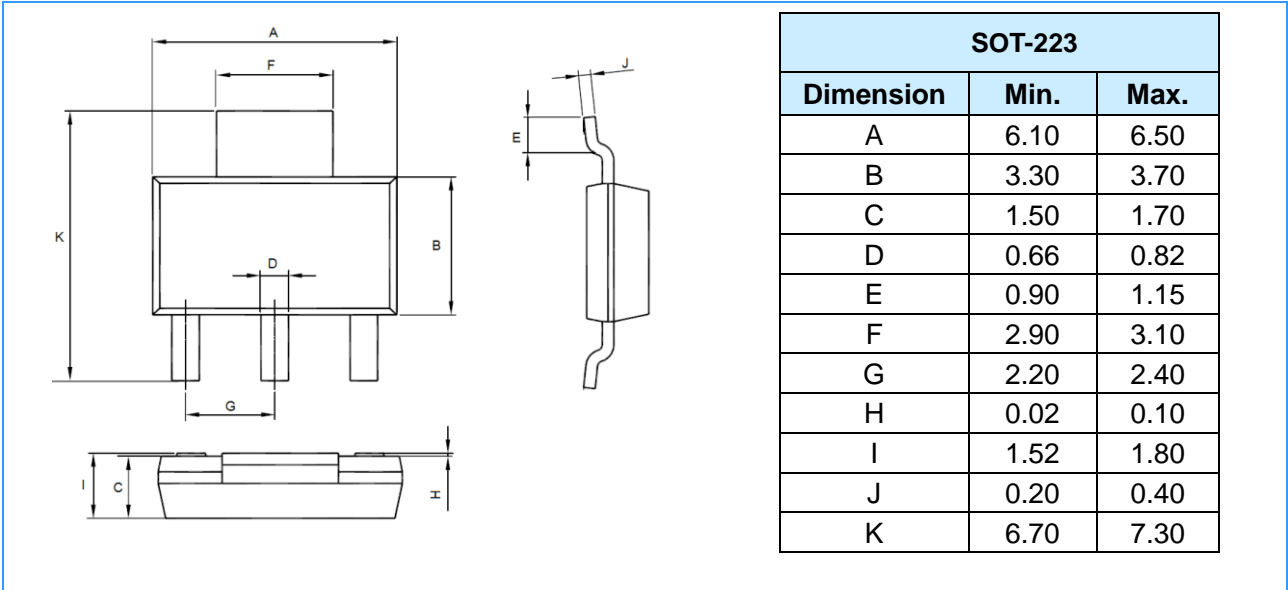


Fig 10  $V_{GS(th)}$  vs. Junction Temperature

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



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

