

### Features

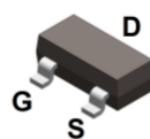
- Low on-resistance
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy

### Typical Applications

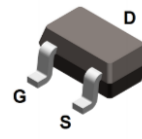
- Switching application

### Mechanical Data

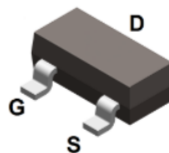
- Case: SOT-23, SOT-323, SOT-23-3L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin-Plated Leads, Solderability-per MIL-STD-202, Method 208



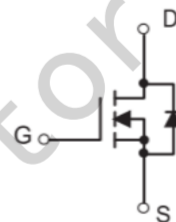
**BSS123**  
**SOT-23**



**BSS123W**  
**SOT-323**



**BSS123-3L**  
**SOT-23-3L**



### Ordering Information

| Part Number | Package   | Shipping Quantity     |
|-------------|-----------|-----------------------|
| BSS123      | SOT-23    | 3000pcs / Tape & Reel |
| BSS123W     | SOT-323   | 3000pcs / Tape & Reel |
| BSS123-3L   | SOT-23-3L | 3000pcs / Tape & Reel |

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

| Parameter                          | Symbol   | Value    | Unit |
|------------------------------------|----------|----------|------|
| Drain-to-Source Voltage            | $V_{DS}$ | 100      | V    |
| Gate-to-Source Voltage             | $V_{GS}$ | $\pm 20$ | V    |
| Continuous Drain Current           | $I_D$    | 170      | mA   |
| Pulsed Drain Current <sup>*3</sup> | $I_{DM}$ | 680      | mA   |

## Thermal Characteristics

| Parameter                            |           | Symbol          | Value       | Unit |
|--------------------------------------|-----------|-----------------|-------------|------|
| Power Dissipation                    | SOT-23    | $P_D$           | 0.35        | W    |
|                                      | SOT-323   |                 | 0.2         | W    |
|                                      | SOT-23-3L |                 | 0.35        | W    |
| Thermal Resistance Junction-to-Air   | SOT-23    | $R_{\theta JA}$ | 357         | °C/W |
|                                      | SOT-323   |                 | 625         | °C/W |
|                                      | SOT-23-3L |                 | 357         | °C/W |
| Operating Junction Temperature Range |           | $T_J$           | -55 to +150 | °C   |
| Storage Temperature Range            |           | $T_{STG}$       | -55 to +150 | °C   |

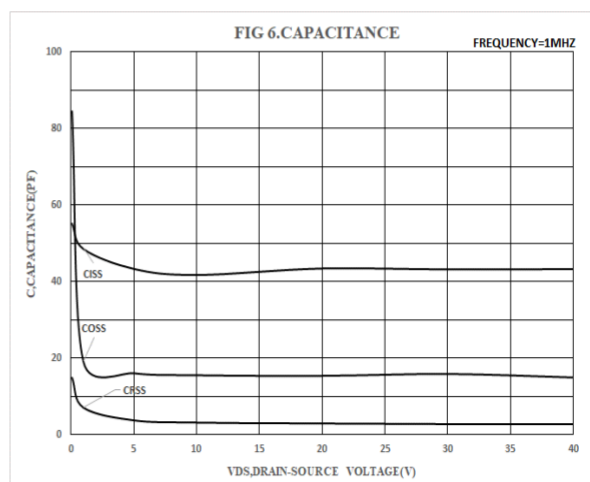
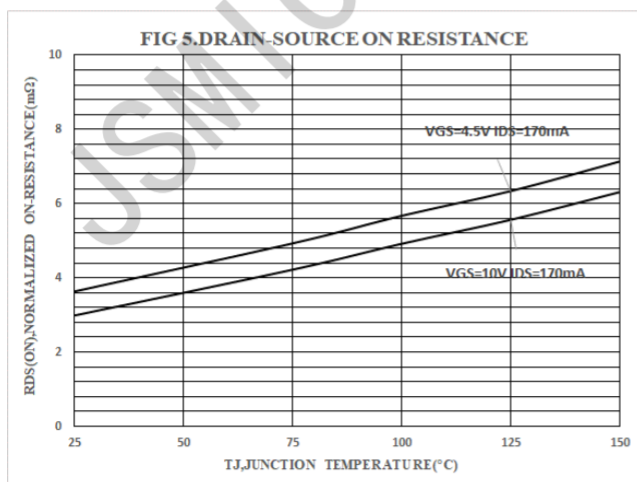
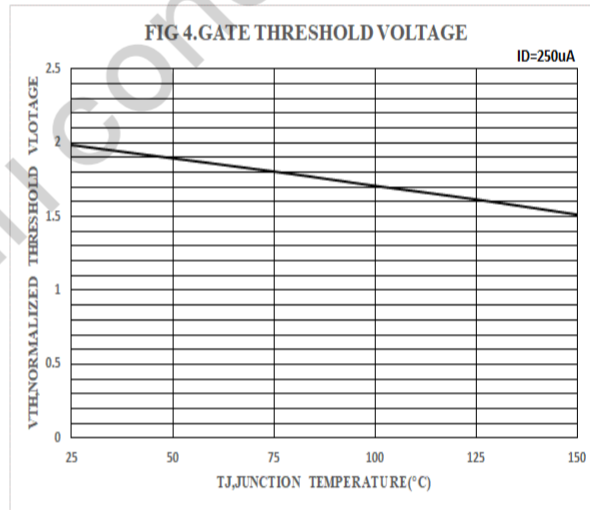
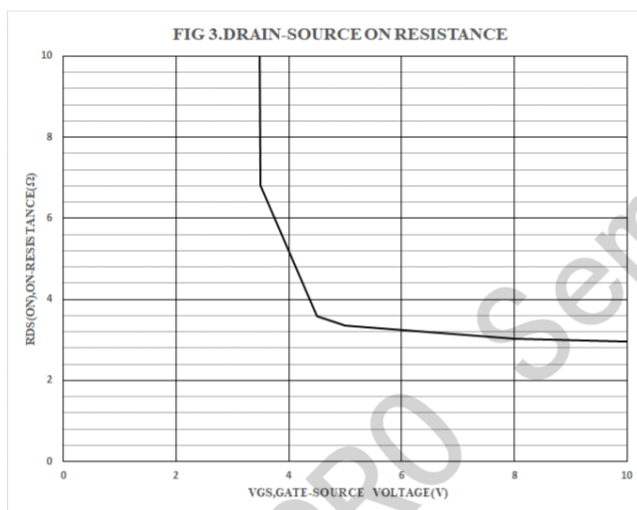
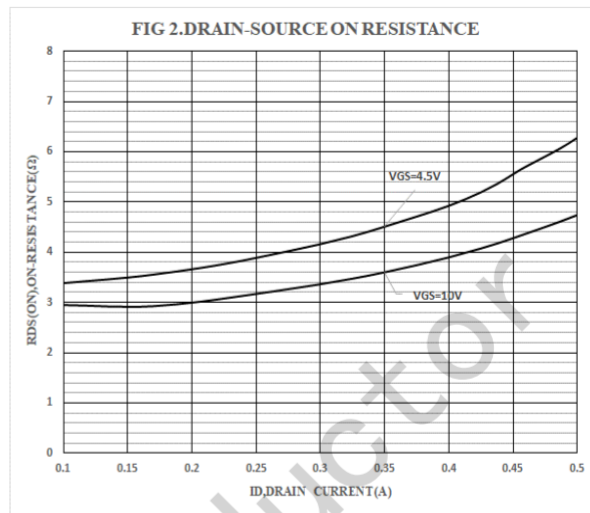
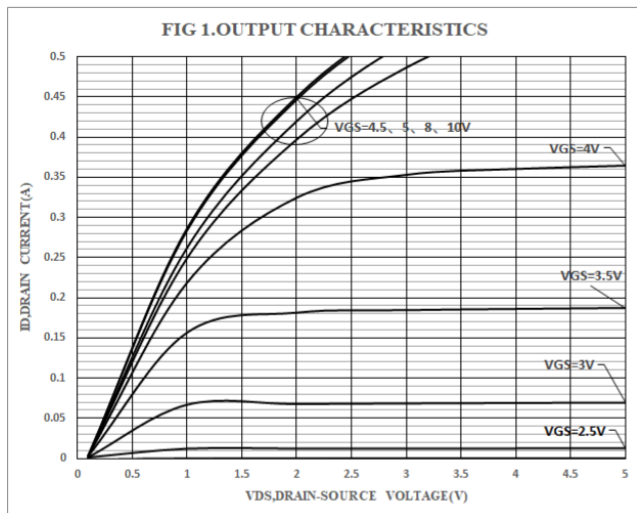
## Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| 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                                                 | 100  | -    | -    | V    |
| I <sub>DSS</sub>                   | Zero Gate Voltage Drain Current      | V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V                                                 | -    | -    | 1    | μA   |
|                                    |                                      | V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V                                                  | -    | -    | 10   | nA   |
| I <sub>GSS</sub>                   | Gate-Body Leakage Current            | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                 | -    | -    | ±1   | μA   |
| On Characteristics                 |                                      |                                                                                              |      |      |      |      |
| R <sub>DS(ON)</sub>                | Static Drain-Source On-resistance *1 | V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.17A                                                | -    | 3.0  | 6    | Ω    |
|                                    |                                      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.17A                                               | -    | 3.5  | 10   |      |
| V <sub>GS(TH)</sub>                | Gate Threshold Voltage               | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                   | 1    | 1.9  | 2.8  | V    |
| Dynamic Characteristics            |                                      |                                                                                              |      |      |      |      |
| C <sub>iss</sub>                   | Input Capacitance                    | V <sub>GS</sub> = 0V<br>V <sub>DS</sub> = 20V<br>f = 1.0MHz                                  | -    | 43   | -    | pF   |
| C <sub>oss</sub>                   | Output Capacitance                   |                                                                                              | -    | 15   | -    |      |
| C <sub>rss</sub>                   | Reverse Transfer Capacitance         |                                                                                              | -    | 2.8  | -    |      |
| Switching Characteristics *2       |                                      |                                                                                              |      |      |      |      |
| t <sub>d(on)</sub>                 | Turn-on Delay Time                   | V <sub>DD</sub> = 30V, I <sub>D</sub> = 0.28A<br>V <sub>GS</sub> = 10V, R <sub>G</sub> = 50Ω | -    | -    | 8    | ns   |
| t <sub>r</sub>                     | Turn-on Rise Time                    |                                                                                              | -    | -    | 8    |      |
| t <sub>d(off)</sub>                | Turn-Off Delay Time                  |                                                                                              | -    | -    | 13   |      |
| t <sub>f</sub>                     | Turn-Off Fall Time                   |                                                                                              | -    | -    | 16   |      |
| Source-Drain Diode Characteristics |                                      |                                                                                              |      |      |      |      |
| V <sub>SD</sub>                    | Diode Forward Voltage *1             | I <sub>S</sub> = 0.3A, V <sub>GS</sub> = 0V                                                  | -    | 0.85 | 1.3  | V    |

Notes:

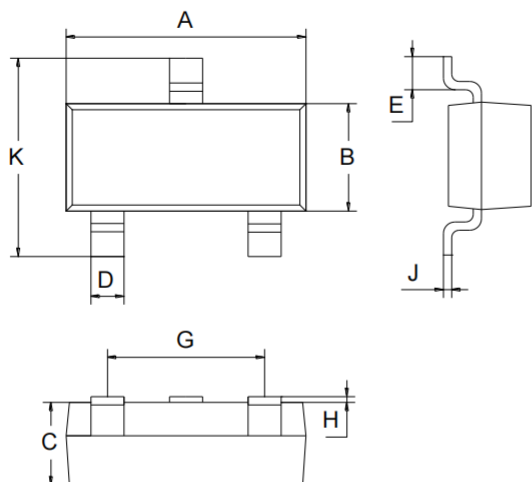
- 1、 Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$
- 2、 Guaranteed by design, not subject to production
- 3、 Pulse width limited by maximum junction temperature

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



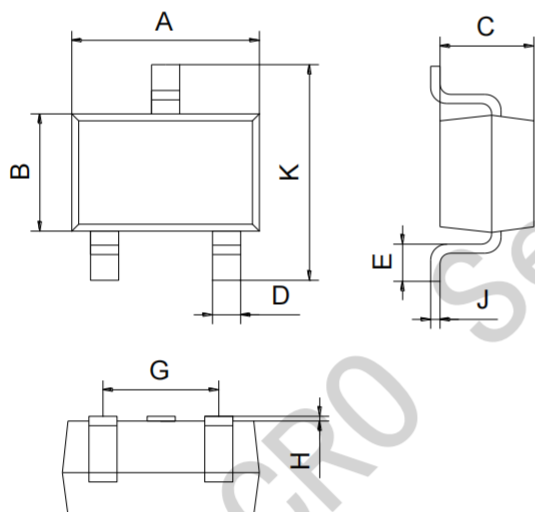
**Package Outline Dimensions** (Unit: mm)

**SOT-23**



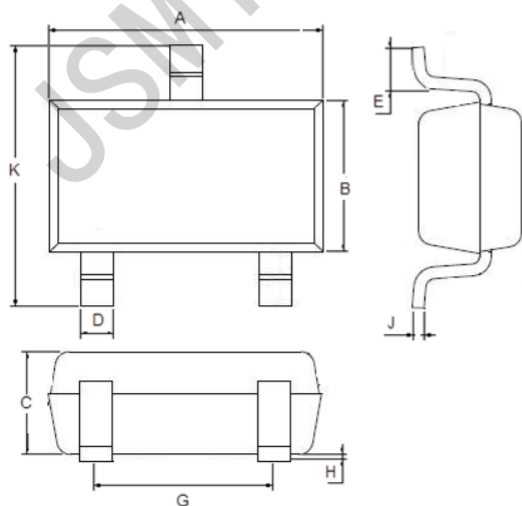
| SOT-23    |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 2.70 | 3.10 |
| B         | 1.10 | 1.50 |
| C         | 0.90 | 1.10 |
| D         | 0.30 | 0.50 |
| E         | 0.35 | 0.48 |
| G         | 1.80 | 2.00 |
| H         | 0.02 | 0.10 |
| J         | 0.05 |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

**SOT-323**



| SOT-323   |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 2.00 | 2.20 |
| B         | 1.15 | 1.35 |
| C         | 0.90 | 1.10 |
| D         | 0.15 | 0.35 |
| E         | 0.25 | 0.40 |
| G         | 1.20 | 1.40 |
| H         | 0.02 | 0.10 |
| J         | 0.05 | 0.15 |
| K         | 2.20 | 2.40 |

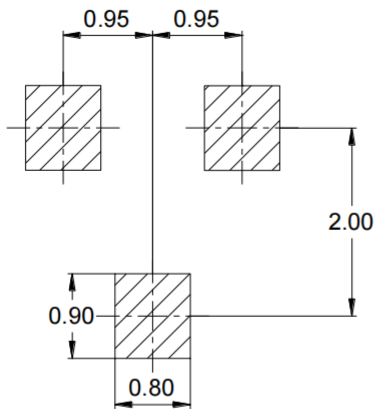
**SOT-23-3L**



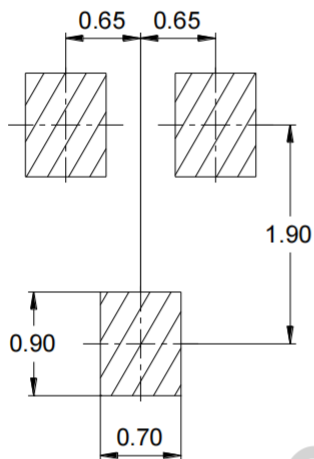
| SOT-23-3L |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 2.80 | 3.00 |
| B         | 1.50 | 1.70 |
| C         | 1.00 | 1.20 |
| D         | 0.35 | 0.45 |
| E         | 0.35 | 0.55 |
| G         | 1.80 | 2.00 |
| H         | 0.02 | 0.10 |
| J         | 0.10 | 0.20 |
| K         | 2.60 | 3.00 |

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

**SOT-23**



**SOT-323**



**SOT-23-3L**

