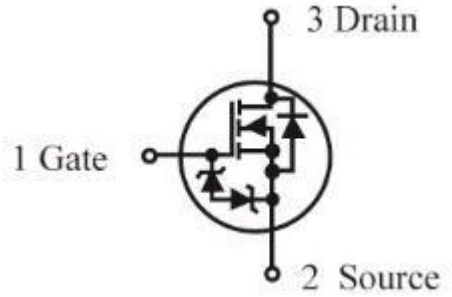
# BSS138

## N-Channel Enhancement Mode MOSFET


SOT-23




### Features

- 50V/0.2A,$R_{DS(ON)}$=3.5Ω(max)@$V_{GS}$=5V,$I_D$=0.2A.
  $R_{DS(ON)}$=10Ω(max)@$V_{GS}$=2.75V,$I_D$=0.2A.
- Super High dense cell design for extremely low $R_{DS(ON)}$.
- Reliable and Rugged.
- Low Threshold Voltage (0.5V~1.5 V)Make it Ideal for Low Voltage Applications.
- ESD protected.
- SOT-23 for Surface Mount Package.

### Marking: SS

### Applications

- Power Management in DC/DC Converters
- Portable and Battery-powered Products

### Absolute Maximum Ratings($T_A$=25℃,unless otherwise noted.)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-source Voltage | $V_{DS}$ | 50 | V |
| Gate-source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous | $I_D$ | 0.2 | A |

### Electrical Characteristics($T_A$=25℃,unless otherwise noted.)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-source breakdown voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 50 | | | V |
| Drain-source leakage current | $I_{DSS}$ | $V_{DS}$=50V, $V_{GS}$=0V | | | 0.5 | μA |
| | | $V_{DS}$=25V, $V_{GS}$=0V | | | 0.1 | μA |
| Gate-source leakage current,Forward | $I_{GSSF}$ | $V_{GS}$=20V, $V_{DS}$=0V | | | 300 | nA |
| Gate-source leakage current,Reverse | $I_{GSSR}$ | $V_{GS}$=-20V, $V_{DS}$=0V | | | -300 | nA |

| | | | | | | |
|---|---|---|---|---|---|---|
| **On Characteristics** | | | | | | |
| Gate Threshold voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ , $I_D$=1.0mA | 0.5 | | 1.5 | V |
| Drain-source on resistance | $R_{DS(on)}$ | $V_{GS}$= 5.0V, $I_D$= 0.2A | | | 3.5 | Ω |
| | | $V_{GS}$= 2.75V, $I_D$= 0.2A | | | 10 | Ω |
| **Drain-Source Diode Characteristics** | | | | | | |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_D$= 0.2A | | | 2.5 | V |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$=25V,$V_{GS}$=0V, f=1MHz | | 31 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 4 | | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 3 | | pF |
| Internal Gate Resistance | $R_G$ | f=1MHz | | 61 | | Ω |

## Typical Characteristics

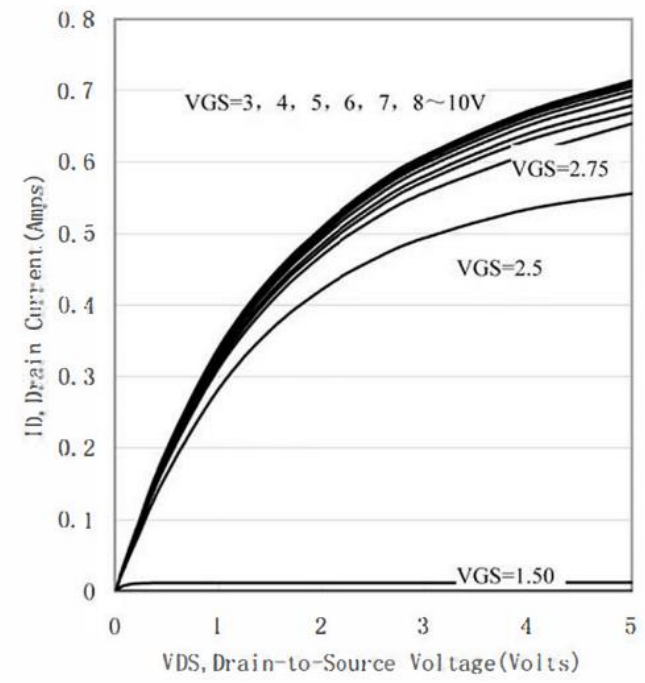



**Figure 1. Output Characteristics**

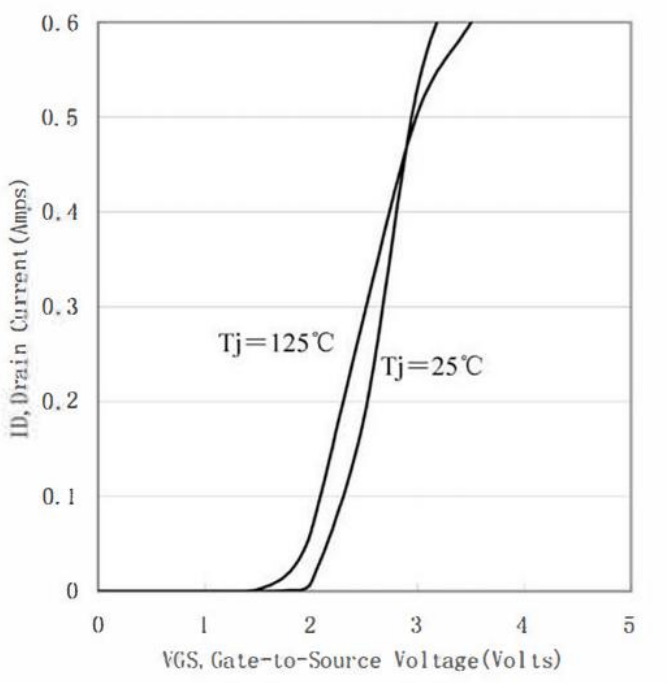



**Figure 2. Transfer Characteristics**

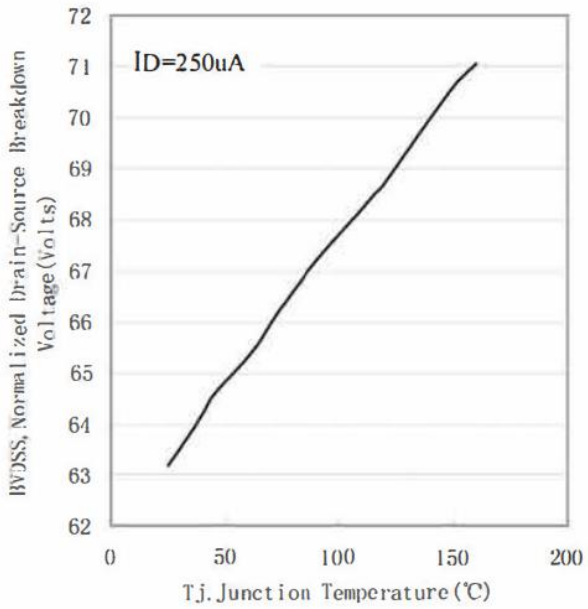



**Figure 3. Breakdown Voltage Variation with Temperature**

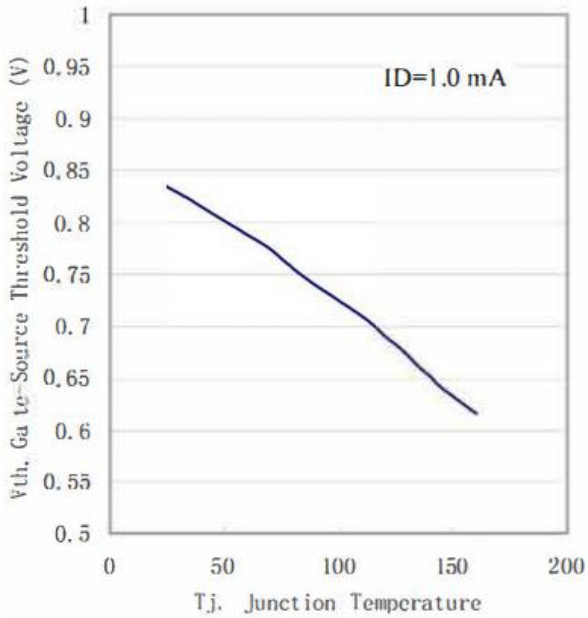



**Figure 4. Gate Threshold Variation with Temperature**

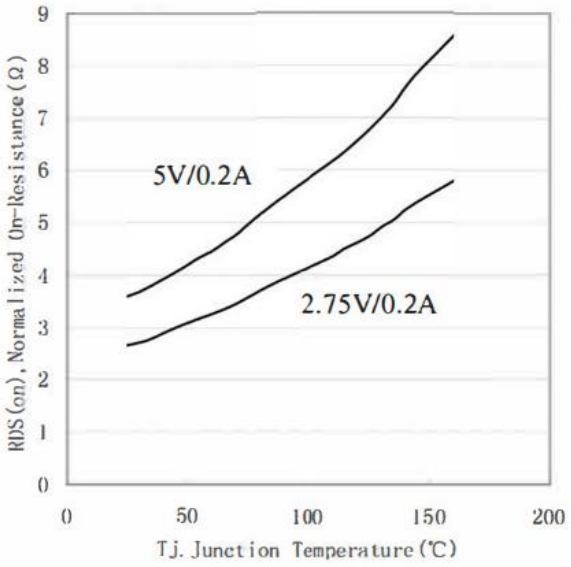



**Figure 5. On-Resistance Variation with Temperature**

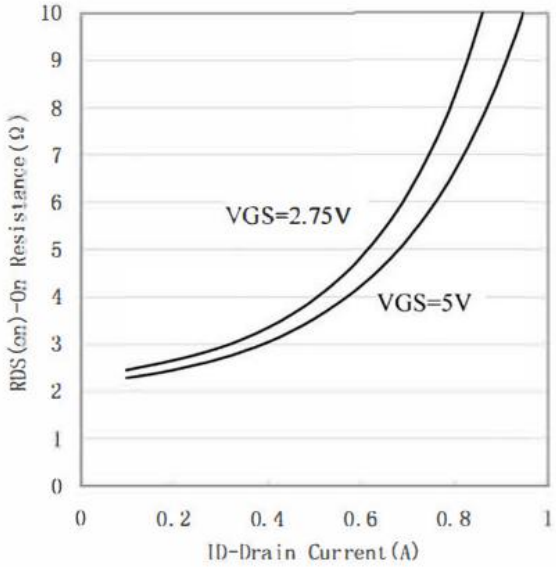



**Figure 6. On-Resistance vs. Drain Current**

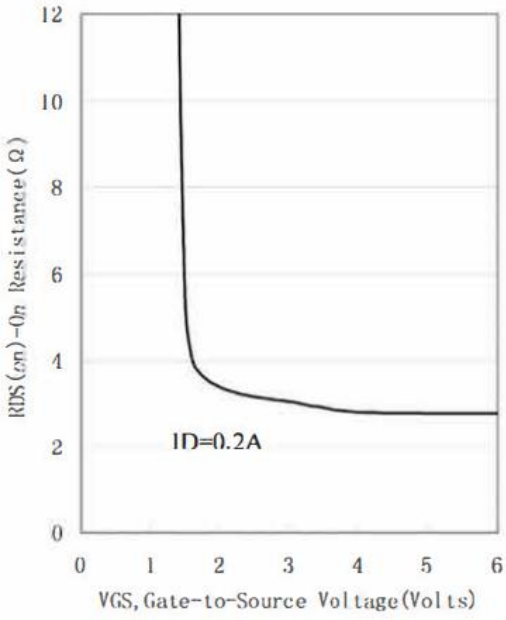



**Figure 7. On-Resistance vs. Gate-to-Source Voltage**

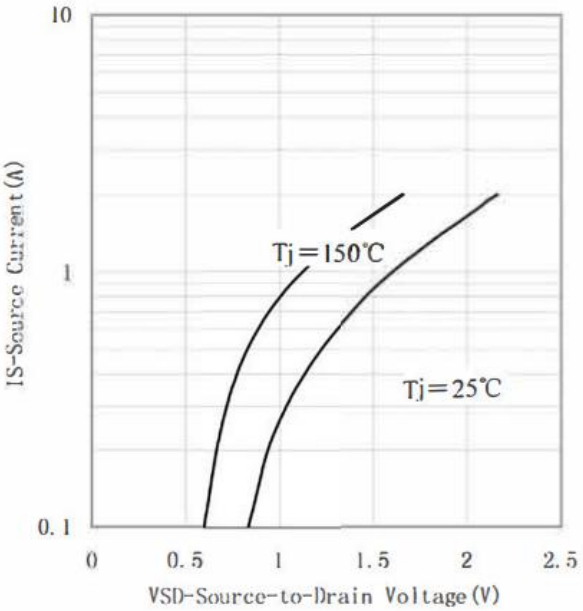
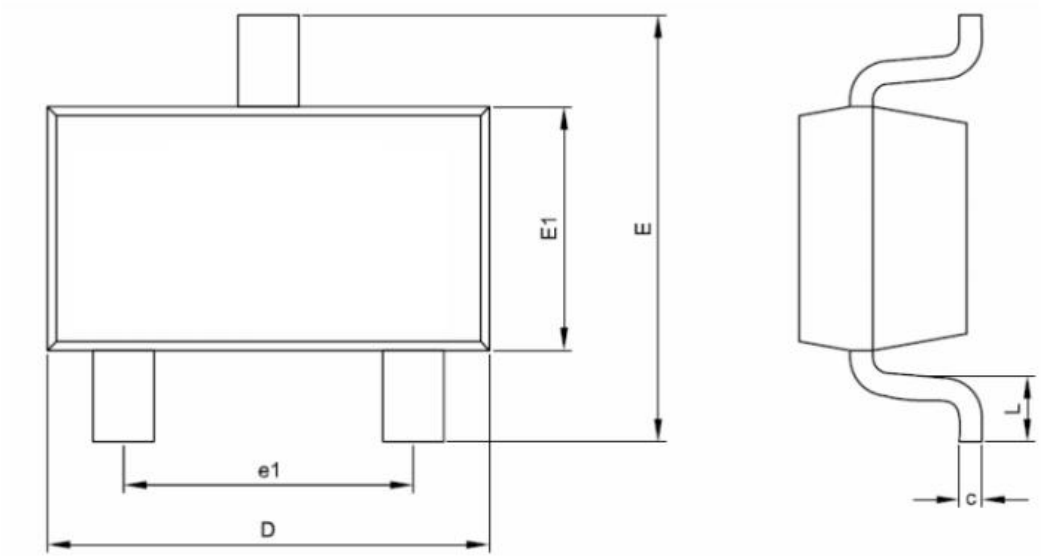


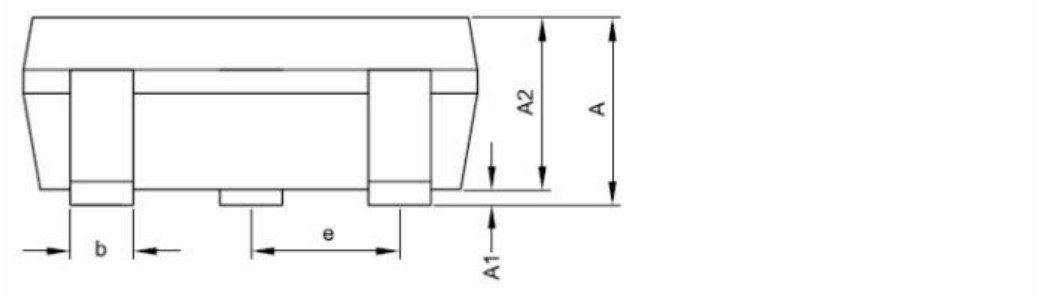

**Figure 8. Source-Drain Diode Forward Voltage**

# Package Information

## SOT-23

## Dimensions in mm




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | — | 1.12 |
| A1 | 0.00 | 0.1 |
| A2 | 0.90 | 1.02 |
| D | 2.90 BSC | |
| E | 2.40 BSC | |
| E1 | 1.20 | 1.40 |
| c | 0.08 | 0.25 |
| b | 0.30 | 0.50 |
| e | 0.95 BSC | |
| e1 | 1.90 BSC | |
| L | 0.20 | 0.60 |