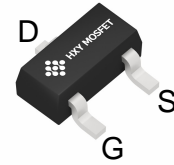


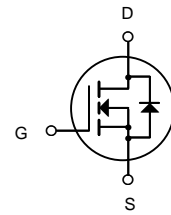


Description

The BSS138NH6327 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOT-23



N-Channel MOSFET

General Features

$V_{DS} = 50V$ $I_D = 0.22A$

$R_{DS(ON)} < 2.0\Omega @ V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|--------------|--------|---------|----------|
| BSS138NH6327 | SOT-23 | SS | 3000 |

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Limit | Unit | |
|-----------------|--|---------------------------|--------------------|---|
| V_{DS} | Drain-Source Voltage | 50 | V | |
| V_{GS} | Gate-Source Voltage | ± 20 | V | |
| I_D | Continuous Drain Current ($T_J = 150^\circ\text{C}$) | $T_A = 25^\circ\text{C}$ | 0.22 | A |
| | | $T_A = 100^\circ\text{C}$ | 0.13 | |
| I_{DM} | Drain Current-Pulsed (Note 1) | 0.88 | A | |
| P_D | Maximum Power Dissipation | 0.35 | W | |
| T_J, T_{STG} | Operating Junction and Storage Temperature Range | -55 To 150 | $^\circ\text{C}$ | |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 357 | $^\circ\text{C/W}$ | |



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

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|--|---------------|---|------|-----|-----------|----------|
| Off characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 50 | | | V |
| Gate-body leakage | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 20V$ | | | ± 100 | nA |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 50V, V_{GS} = 0V$ | | | 0.5 | μA |
| | | $V_{DS} = 30V, V_{GS} = 0V$ | | | 100 | nA |
| On characteristics | | | | | | |
| Gate-threshold voltage (note 1) | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 1mA$ | 0.8 | | 1.5 | V |
| Static drain-source on-resistance (note 1) | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 0.22A$ | | 1.1 | 2.0 | Ω |
| | | $V_{GS} = 4.5V, I_D = 0.22A$ | | 1.5 | 3 | |
| Forward transconductance (note 1) | g_{FS} | $V_{DS} = 10V, I_D = 0.22A$ | 0.12 | | | S |
| Dynamic characteristics (note 2) | | | | | | |
| Input capacitance | C_{iss} | $V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$ | | 27 | | pF |
| Output capacitance | C_{oss} | | | 13 | | |
| Reverse transfer capacitance | C_{rss} | | | 6 | | |
| Switching characteristics | | | | | | |
| Turn-on delay time (note 1,2) | $t_{d(on)}$ | $V_{DD} = 30V, V_{DS} = 10V,$ $I_D = 0.29A, R_{GEN} = 6\Omega$ | | | 5 | ns |
| Rise time (note 1,2) | t_r | | | | 18 | |
| Turn-off delay time (note 1,2) | $t_{d(off)}$ | | | | 36 | |
| Fall time (note 1,2) | t_f | | | | 14 | |
| Drain-source body diode characteristics | | | | | | |
| Body diode forward voltage (note 1) | V_{SD} | $I_S = 0.44A, V_{GS} = 0V$ | | | 1.4 | V |

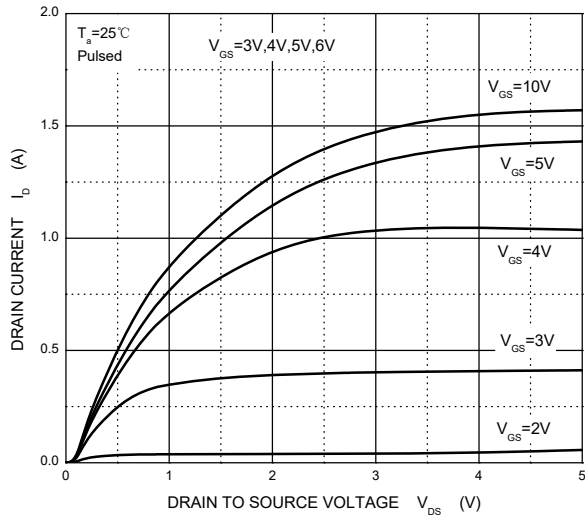
Notes:

1. Pulse Test ; Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
2. These parameters have no way to verify.

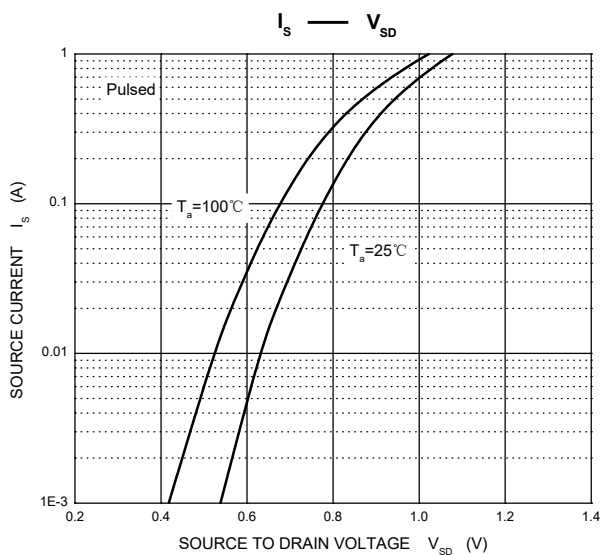
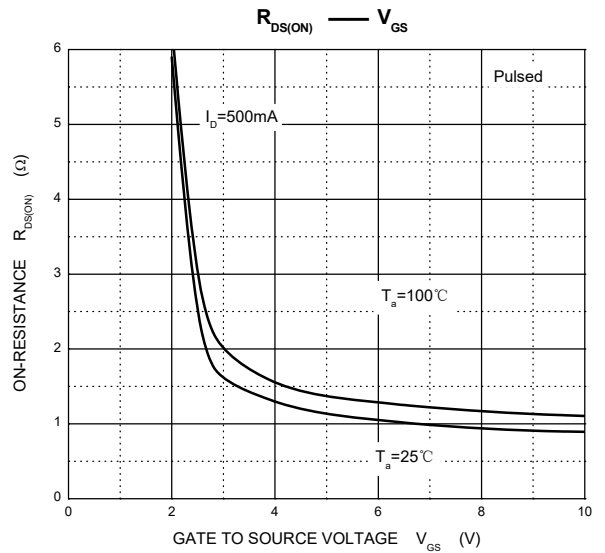
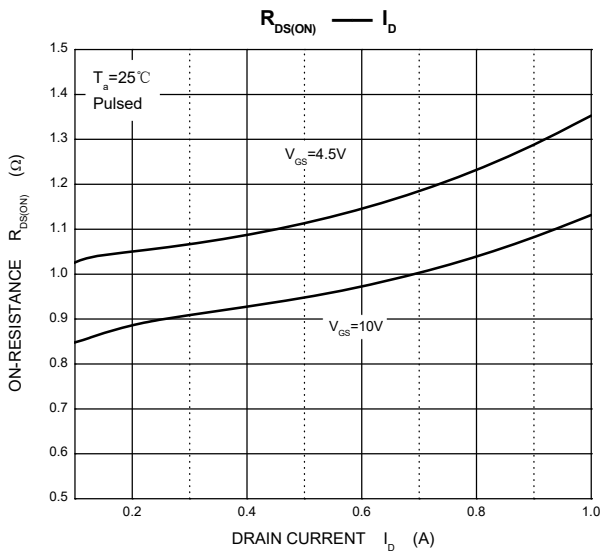
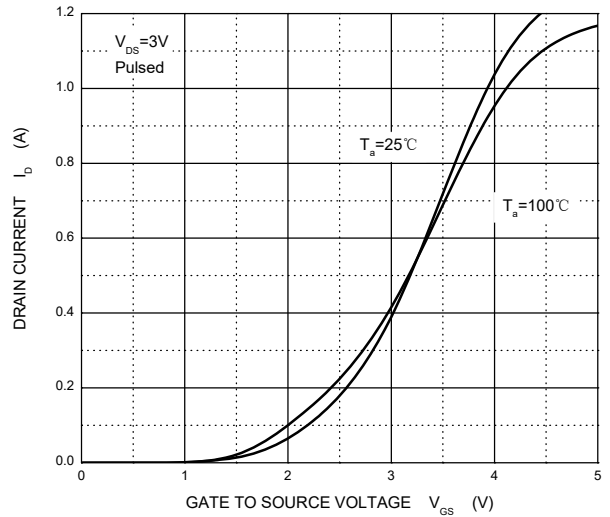


Typical Characteristics

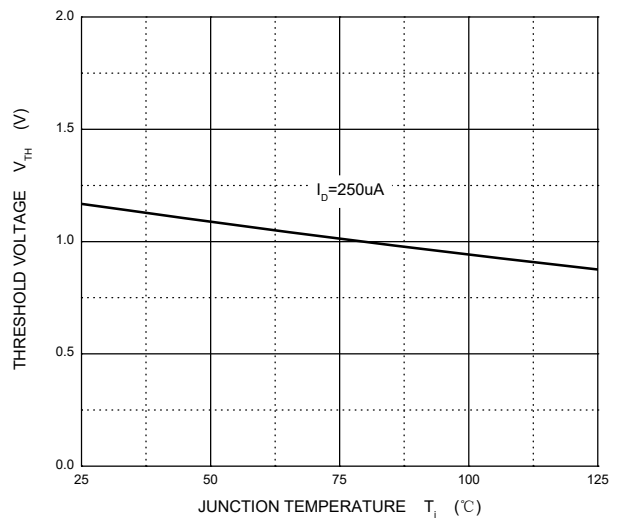
Output Characteristics



Transfer Characteristics

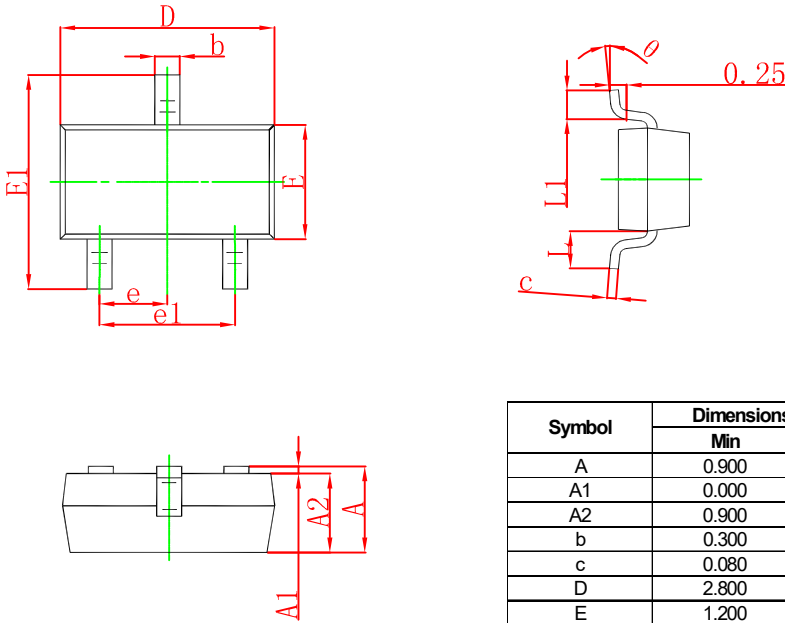


Threshold Voltage



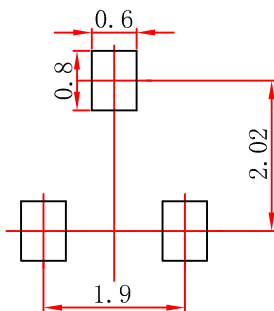


SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.



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