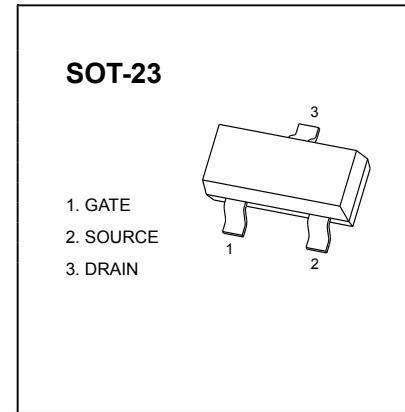


SOT-23 Plastic-Encapsulate MOSFETS

BSS138

BSS138 MOSFET (N-Channel)

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| 50V | 3 Ω @10V | 200mA |
| | 4 Ω @5V | |



FEATURE

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

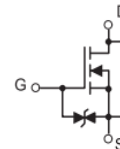
APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

MARKING



Equivalent Circuit



MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-----------------|------------|--------------------|
| Drain-Source Voltage | V_{DS} | 50 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | 200 | mA |
| Power Dissipation | P_D | 0.225 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 556 | $^\circ\text{C/W}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -50 ~ +150 | |

SOT-23 Plastic-Encapsulate MOSFETS

BSS138

MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---------------------------------|---------------|--|------|-----|----------|----------|
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0\text{ V}$, $I_D=250\text{ }\mu\text{A}$ | 50 | | | V |
| Gate-Threshold Voltage | $V_{th(GS)}$ | $V_{DS}=V_{GS}$, $I_D=250\text{ }\mu\text{A}$ | 0.5 | | 1.5 | |
| Gate-body Leakage | I_{GSS} | $V_{DS}=0\text{ V}$, $V_{GS}=\pm 20\text{ V}$ | | | ± 80 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=60\text{ V}$, $V_{GS}=0\text{ V}$ | | | 80 | nA |
| On-state Drain Current | $I_{D(ON)}$ | $V_{GS}=10\text{ V}$, $V_{DS}=7\text{ V}$ | 500 | | | mA |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10\text{ V}$, $I_D=500\text{mA}$ | | 2 | 3 | Ω |
| | | $V_{GS}=5\text{ V}$, $I_D=50\text{mA}$ | | 3 | 4 | |
| Forward Trans conductance | g_{fs} | $V_{DS}=10\text{ V}$, $I_D=200\text{mA}$ | 80 | | | ms |
| Drain-source on-voltage | $V_{DS(on)}$ | $V_{GS}=10\text{V}$, $I_D=500\text{mA}$ | | | 3.75 | V |
| | | $V_{GS}=5\text{V}$, $I_D=50\text{mA}$ | | | 0.375 | V |
| Diode Forward Voltage | V_{SD} | $I_S=100\text{mA}$, $V_{GS}=0\text{ V}$ | 0.55 | | 1.2 | V |
| Input Capacitance * | C_{iss} | $V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$ | | | 50 | pF |
| Output Capacitance * | C_{oss} | | | | 25 | |
| Reverse Transfer Capacitance * | C_{rss} | | | | 5 | |

SWITCHING TIME

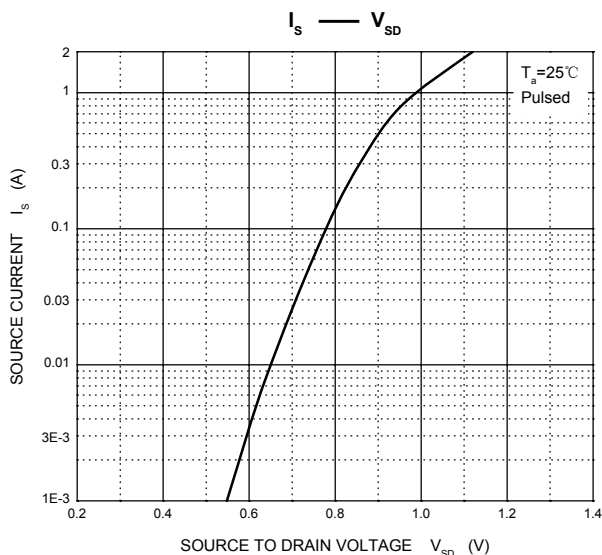
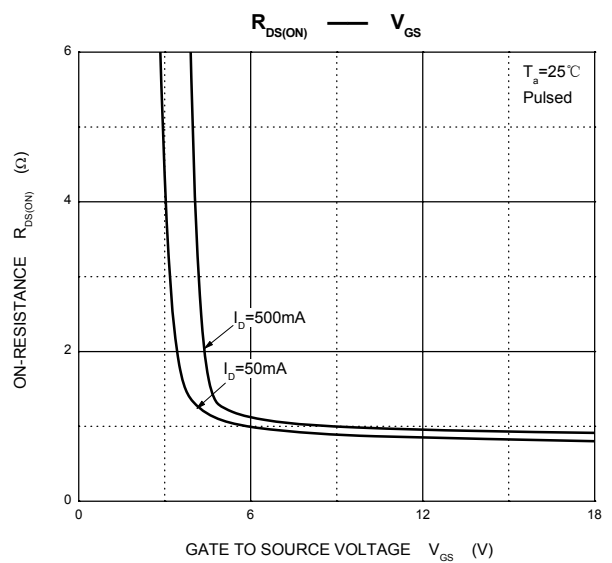
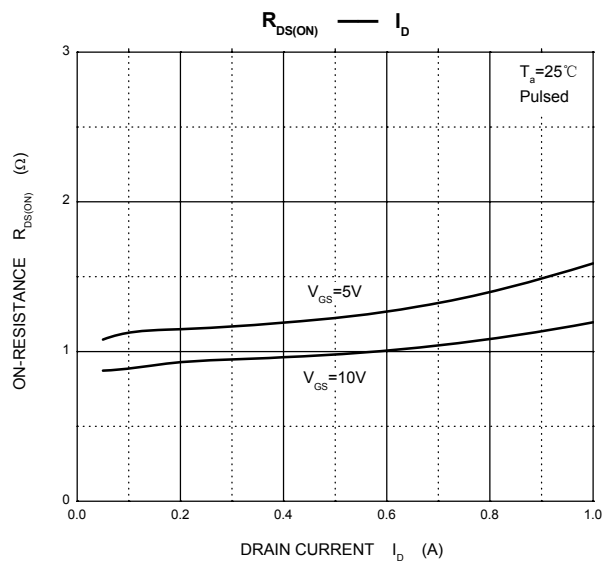
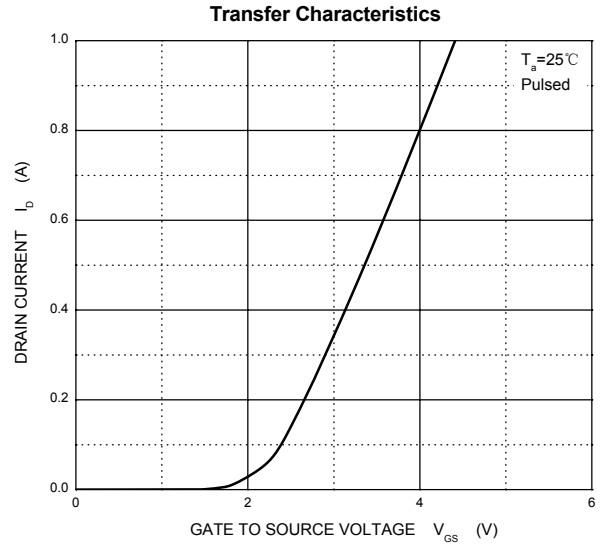
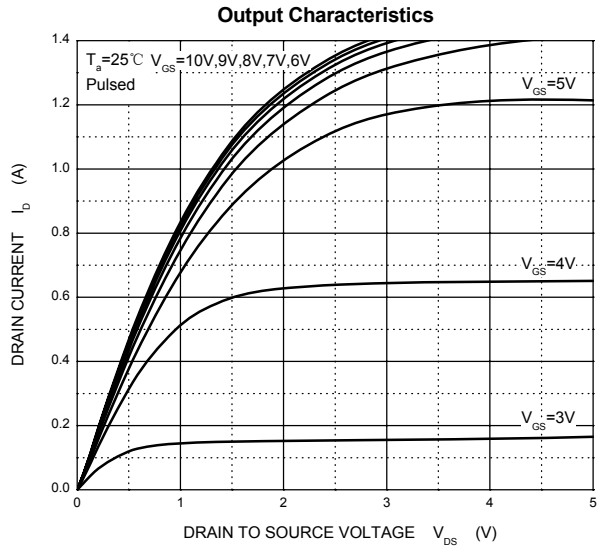
| | | | | | | |
|-----------------|--------------|---|----------------|--|----|----|
| Turn-on Time * | $t_{d(on)}$ | $V_{DD}=25\text{ V}$, $R_L=50\Omega$, $I_D=500\text{mA}$, $V_{GEN}=10\text{ V}$ | | | 20 | ns |
| Turn-off Time * | $t_{d(off)}$ | | $R_G=25\Omega$ | | | |

*These parameters have no way to verify.

SOT-23 Plastic-Encapsulate MOSFETS

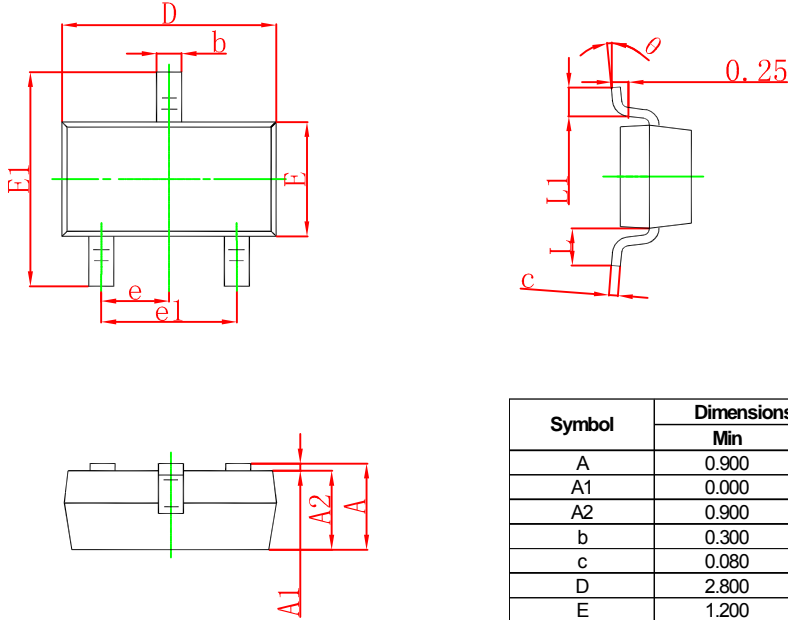
BSS138

Typical Characteristics



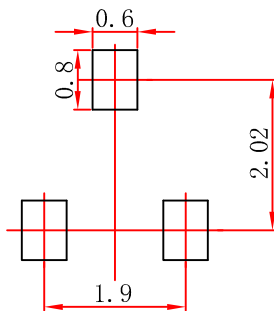
SOT-23 Plastic-Encapsulate MOSFETS BSS138

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.