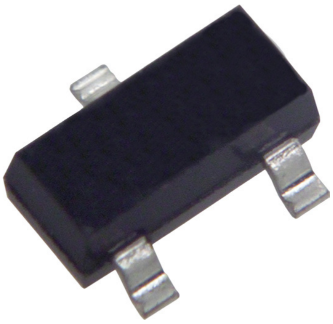
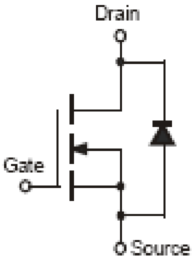
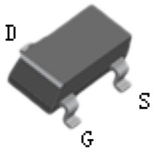
# N-Channel Logic Level Enhancement Mode Field Effect Transistor







**SOT-23**

## Features:

- Low On-Resisrance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input / Output Leakage

## Applications:

- N-channel Enhancement Mode Effect Transistor
- Switching Application

## Maximum Ratings:

**Ratings at 25°C unless otherwise specified.**

| Parameter | Symbol | Value | Units |
|---|---|---|---|
| Drain-source voltage | $V_{DSS}$ | 50 | V |
| Drain-gate voltage RGS ≤20kΩ | $V_{GGR}$ | 50 | V |
| Gate-source voltage | $V_{GSS}$ | ±20 | V |
| Drain current -continuous | $I_D$ | 200 | mA |
| Power dissipation | $P_D$ | 300 | mW |
| Thermal resistance, junction-to-ambient | $R_{\theta JA}$ | 417 | °C/W |
| Junction and storage temperature | $T_J$, $T_{stg}$ | -55 to +150 | °C |

## Electrical Characteristics:

**Ratings at 25°C unless otherwise specified**

| Parameter | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Gate leakage current | $I_{GSS}$ | $V_{GS}$= ±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=250uA | 50 | 75 | - | V |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 0.5 | 1.2 | 1.5 | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=50V, $V_{GS}$=0V | - | - | 0.5 | µA |
| Drain-source on-state resistance | $R_{DS(on)}$ | $I_D$=0.22A, $V_{GS}$=10V | - | 1.4 | 3.5 | Ω |
| Forward transfer admittance | $g_{FS}$ | $V_{DS}$=25V, $I_D$=0.2A, f=1MHz | 100 | - | - | mS |
| Input capacitance | $C_{ISS}$ | $V_{DS}$=10V ,$V_{GS}$=0V, f=1MHz | - | - | 50 | pF |
| Output capacitance | $C_{OSS}$ | | - | - | 25 | |
| Reverse transfer capacitance | $C_{RSS}$ | | - | - | 8 | |
| Turn-on delay time | $t_{D(ON)}$ | $V_{DD}$=30V, $I_D$= 0.2A, $R_{GEN}$=50Ω | - | - | 20 | ns |
| Turn-off delay time | $t_{D(OFF)}$ | | - | - | | ns |

## Typical Characteristics:

**$T_A$ = 25°C unless otherwise specified**

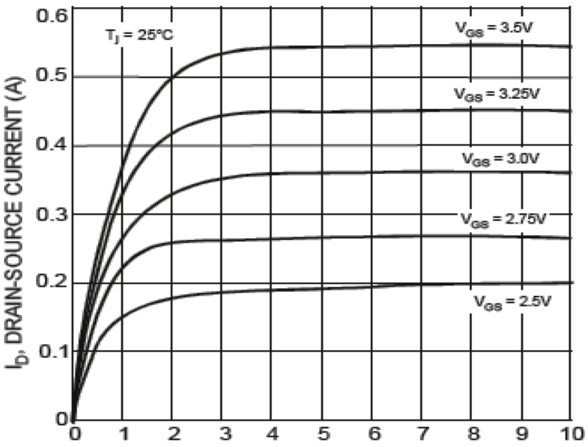


Fig. 1 Drain-Source Current vs. Drain-Source Voltage

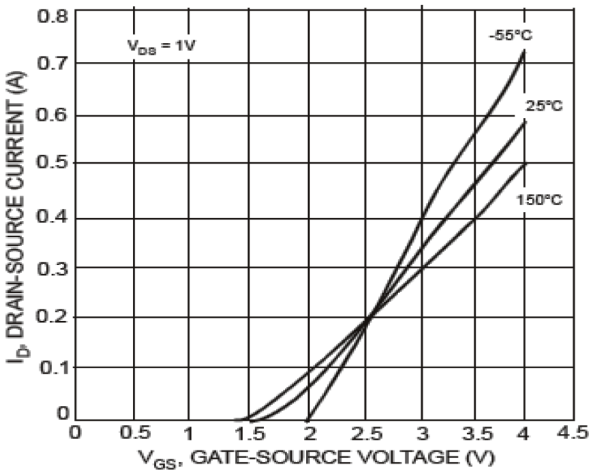


Fig. 2 Transfer Characteristics

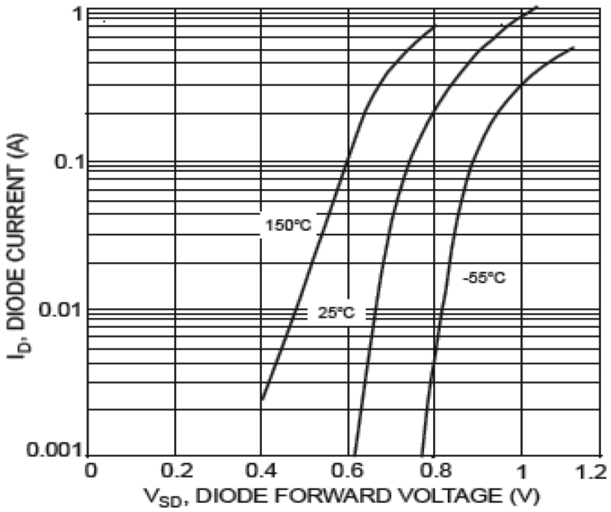


Fig. 3 Body Diode Current vs. Body Diode Voltage

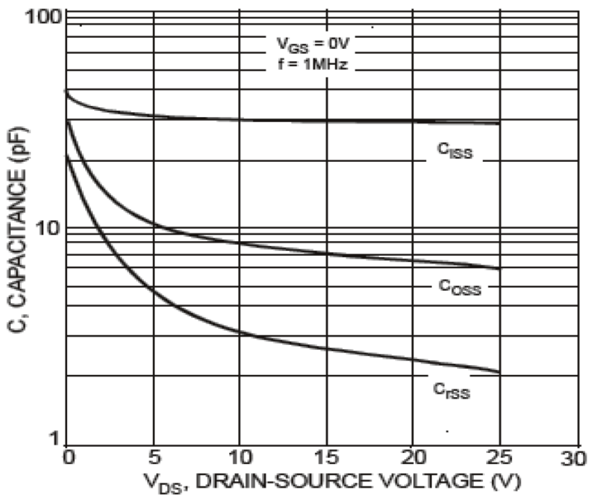
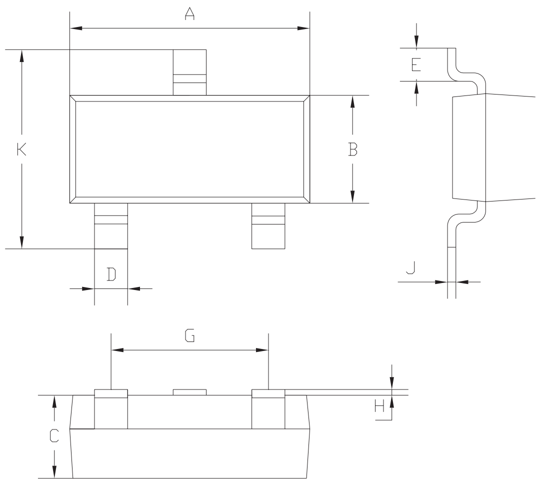


Fig. 4 Capacitance vs. Drain-Source Voltage

## Package Outline:

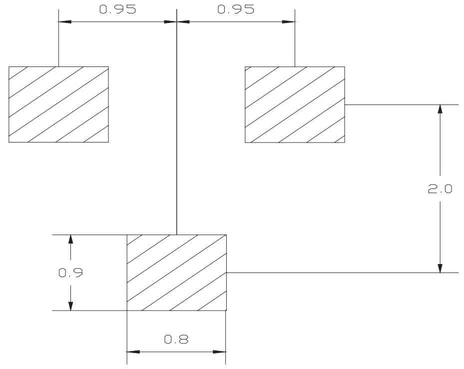
**Plastic surface mounted package**



| SOT-23 | | |
|---|---|---|
| **Dim.** | **Min.** | **Max.** |
| A | 2.85 | 2.95 |
| B | 1.25 | 1.35 |
| C | 1 Typ. | |
| D | 0.37 | 0.43 |
| E | 0.35 | 0.48 |
| G | 1.85 | 1.95 |
| H | 0.02 | 0.1 |
| J | 0.1 Typ. | |
| K | 2.35 | 2.45 |

Dimensions : Millimetres

## Soldering Footprint:



Dimensions : Millimetres

## Package Information:

| Device | Package | Shipping |
|---|---|---|
| BSS138-7-F | SOT-23 | 3,000 / Tape & Reel |

## Part Number Table

| Description | Part Number |
|---|---|
| N-Channel Logic Level Enhancement Mode Field Effect Transistor | BSS138-7-F |

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