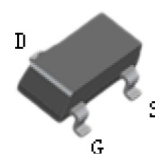
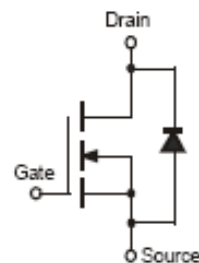
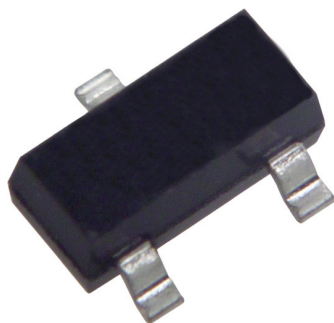


# N-Channel Logic Level Enhancement Mode Field Effect Transistor



SOT-23

## Features:

- Low On-Resistance
- 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                       | $V_{DS}$        | 50          | V             |
| Drain-gate voltage $R_{GS} \leq 20k\Omega$ | $V_{GGR}$       | 50          | V             |
| Gate-source voltage                        | $V_{GS}$        | $\pm 20$    | V             |
| Drain current -continuous                  | $I_D$           | 200         | mA            |
| Power dissipation                          | $P_D$           | 300         | mW            |
| Thermal resistance, junction-to-ambient    | $R_{\theta JA}$ | 417         | $^{\circ}C/W$ |
| Junction and storage temperature           | $T_J, T_{stg}$  | -55 to +150 | $^{\circ}C$   |

# N-Channel Logic Level Enhancement Mode Field Effect Transistor



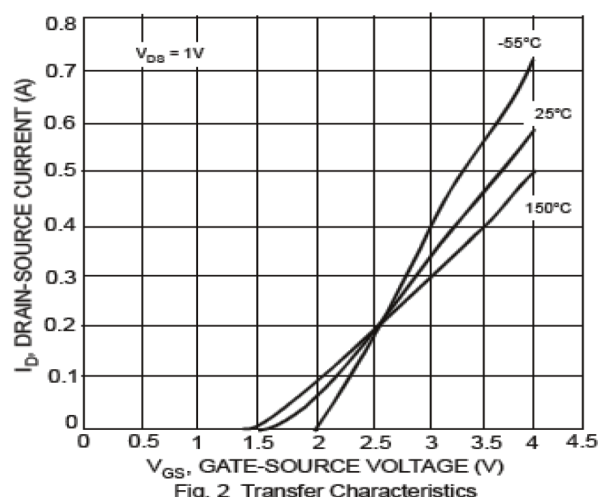
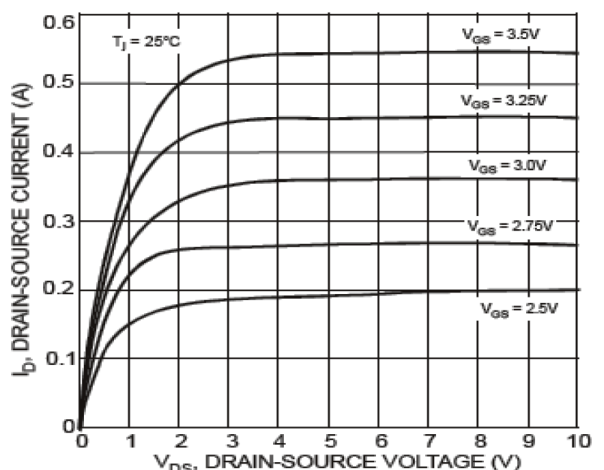
## Electrical Characteristics:

Ratings at 25°C unless otherwise specified

| Parameter                        | Symbol        | Test conditions                                | Min. | Typ. | Max.      | Unit     |
|----------------------------------|---------------|------------------------------------------------|------|------|-----------|----------|
| Gate leakage current             | $I_{GSS}$     | $V_{GS} = \pm 20V, V_{DS} = 0V$                | -    | -    | $\pm 100$ | nA       |
| Drain-source breakdown voltage   | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                  | 50   | 75   | -         | V        |
| Gate threshold voltage           | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$              | 0.5  | 1.2  | 1.5       | V        |
| Zero gate voltage drain current  | $I_{DSS}$     | $V_{DS} = 50V, V_{GS} = 0V$                    | -    | -    | 0.5       | $\mu A$  |
| Drain-source on-state resistance | $R_{DS(on)}$  | $I_D = 0.22A, V_{GS} = 10V$                    | -    | 1.4  | 3.5       | $\Omega$ |
| 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               | $t_{D(ON)}$   | $V_{DD} = 30V, I_D = 0.2A, R_{GEN} = 50\Omega$ | -    | -    | 20        | ns       |
| Turn-off delay time              | $t_{D(OFF)}$  |                                                | -    | -    |           | ns       |

## Typical Characteristics:

$T_A = 25^\circ C$  unless otherwise specified



# N-Channel Logic Level Enhancement Mode Field Effect Transistor

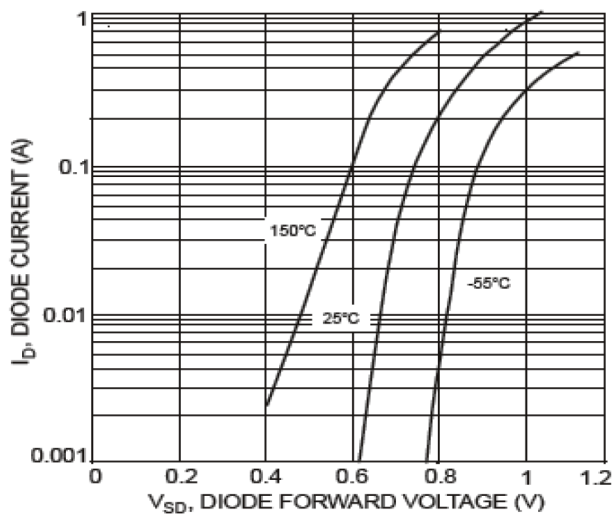


Fig. 3 Body Diode Current vs. Body Diode Voltage

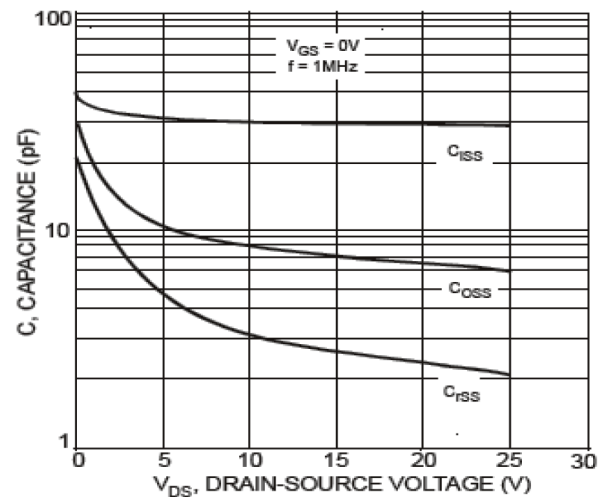
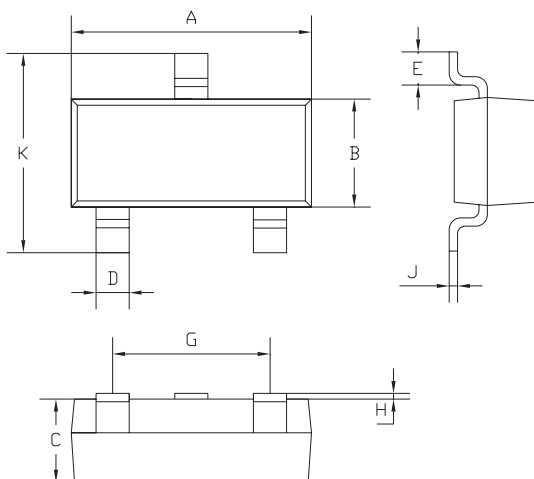


Fig. 4 Capacitance vs. Drain-Source Voltage

## Package Outline:

Plastic surface mounted package



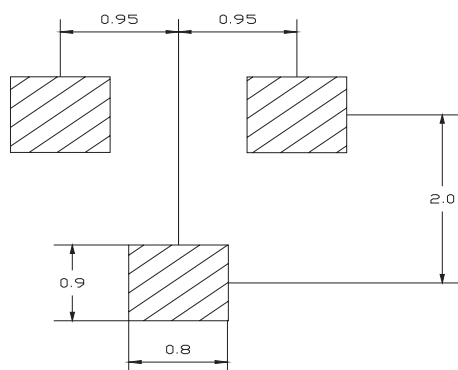
| SOT-23 |          |      |
|--------|----------|------|
| Dim.   | Min.     | Max. |
| A      | 2.85     | 2.95 |
| B      | 1.25     | 1.35 |
| C      | 1 Typ.   |      |
| D      | 0.37     | 0.43 |
| E      | 0.35     | 0.48 |
| G      | 1.85     | 1.95 |
| H      | 0.02     | 0.1  |
| J      |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

Dimensions : Millimetres

# N-Channel Logic Level Enhancement Mode Field Effect Transistor



## 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<br>Mode Field Effect Transistor | BSS138-7-F  |

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