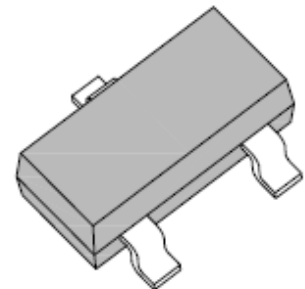


## SMD Power MOSFET Transistor (N-Channel)

### Features

- Low On-Resistance:6Ω
- Low input capacitance:20pF
- Low output capacitance:9pF
- Low threshold:2.8V
- Fast switching speed:20nS
- RoHS Compliance and Halogen Free



SOT-23



HALOGEN  
FREE

### Application

- DC to DC converter
- Cellular & PCMCIA card
- Cordless telephone
- Power management in portable and battery etc.

### Mechanical Data

|                   |   |
|-------------------|---|
| <b>Case:</b>      | SOT-23, Plastic Package                 |
| <b>Terminals:</b> | Solderable per MIL-STD-202G, Method 208 |
| <b>Weight:</b>    | 0.008 gram                              |

### Maximum Ratings *(T<sub>Ambient</sub>=25°C unless noted otherwise)*

| Symbol                                | Description                             | BSS123      | Unit  | Conditions            |
|---------------------------------------|---|-------------|-------|-----------------------|
|                                       | Marking Code                            | SA          |       |                       |
| <b>V<sub>DSS</sub></b>                | Drain-Source Voltage                    | 100         | V     |                       |
| <b>V<sub>GSS</sub></b>                | Gate-Source Voltage                     | ± 20        | V     |                       |
| <b>I<sub>D</sub></b>                  | Drain Current Continuous                | 170         | mA    | T <sub>A</sub> =25° C |
| <b>I<sub>DM</sub></b>                 | Drain Current Pulsed (Note 1)           | 680         | mA    |                       |
| <b>P<sub>D</sub></b>                  | Drain Power Dissipation (Note 2)        | 225         | mW    | T <sub>A</sub> =25° C |
| <b>R<sub>thJA</sub></b>               | Thermal Resistance, Junction to Ambient | 556         | ° C/W |                       |
| <b>T<sub>J</sub>, T<sub>STG</sub></b> | Storage Temperature Range               | -55 to +150 | ° C   |                       |

# SMD Power MOSFET Transistor (N-Channel)

## BSS123

### Electrical Characteristics ( $T_{Ambient}=25^{\circ}C$ unless noted otherwise)

| Symbol          | Description                          | Min. | Typ. | Max. | Unit     | Conditions                                 |
|-----------------|--------------------------------------|------|------|------|----------|--|
| <b>V(BR)DSS</b> | Drain-Source Breakdown Voltage       | 100  | -    | -    | V        | $V_{GS}=0V, I_D=250\mu A$                  |
| <b>VGS(th)</b>  | Gate Threshold Voltage               | 0.8  | -    | 2.8  | V        | $V_{DS}=V_{GS}, I_D=1mA$                   |
| <b>IGSS</b>     | Gate-Body Leakage Current            | -    | -    | 50   | nA       | $V_{DS}=0V, V_{GS}=20V$                    |
| <b>IDSS</b>     | Zero Gate Voltage Drain Current      | -    | -    | 15   | $\mu A$  | $V_{DS}=0V, V_{GS}=100V, T_J=25^{\circ}C$  |
|                 |                                      | -    | -    | 60   | $\mu A$  | $V_{DS}=0V, V_{GS}=100V, T_J=125^{\circ}C$ |
| <b>RDS(ON)</b>  | Static Drain-to-Source On-Resistance | -    | 5.0  | 6.0  | $\Omega$ | $V_{GS}=10V, I_D=0.1A$                     |
| <b>gFS</b>      | Forward Transconductance             | 8.0  | -    | -    | mS       | $V_{DS}=25V, I_D=100mA$                    |

### Dynamic Characteristics ( $T_{Ambient}=25^{\circ}C$ unless noted otherwise)

| Symbol      | Description                  | Min. | Typ. | Max. | Unit | Conditions   |
|-------------|------------------------------|------|------|------|------|--|
| <b>Ciss</b> | Input Capacitance            | -    | 20   | -    | pF   | $V_{DS}=25V, V_{GS}=0V, f=1MHz$                      |
| <b>Crss</b> | Reverse Transfer Capacitance | -    | 4.0  | -    |      |  |
| <b>Coss</b> | Output Capacitance           | -    | 9.0  | -    |      |  |
| <b>ton</b>  | Switching Time Turn-On Time  | -    | 20   | -    | nS   | $V_{CC}=30V, R_{GS}=50\Omega, I_C=0.28A, V_{GS}=10V$ |
| <b>toff</b> | Switching Time Turn-Off Time | -    | 40   | -    |      |  |

### Reverse Diode ( $T_{Ambient}=25^{\circ}C$ )

| Symbol     | Description                        | Min. | Typ. | Max. | Unit | Conditions             |
|------------|------------------------------------|------|------|------|------|------------------------|
| <b>VSD</b> | Drain-Source Diode Forward Voltage | -    | -    | 1.3  | V    | $V_{GS}=0V, I_D=0.34A$ |

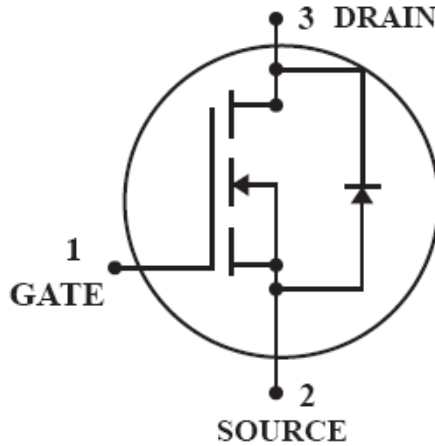
**Note:** (1) Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$

(2) RF-5=1.0X0.75X0.062m.

# SMD Power MOSFET Transistor (N-Channel)

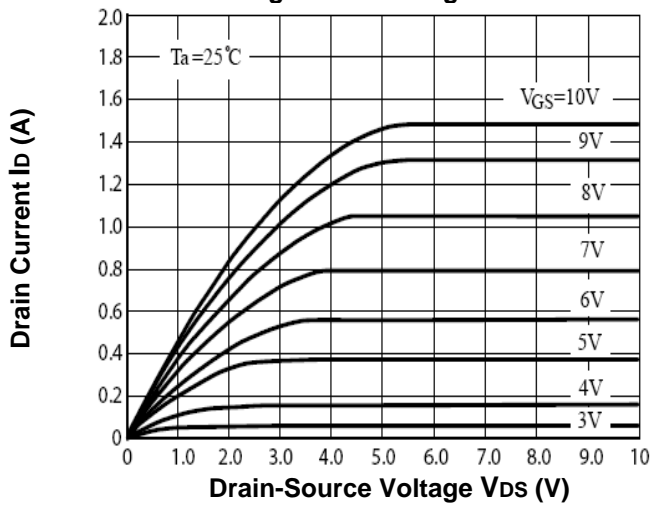
**BSS123**

## Switching Time Test Circuit

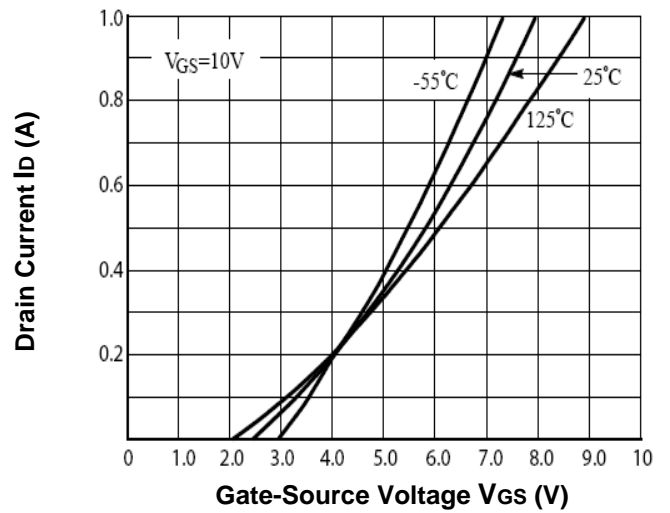


## Typical Characteristics Curves

**Fig.1- Ohmic Region**



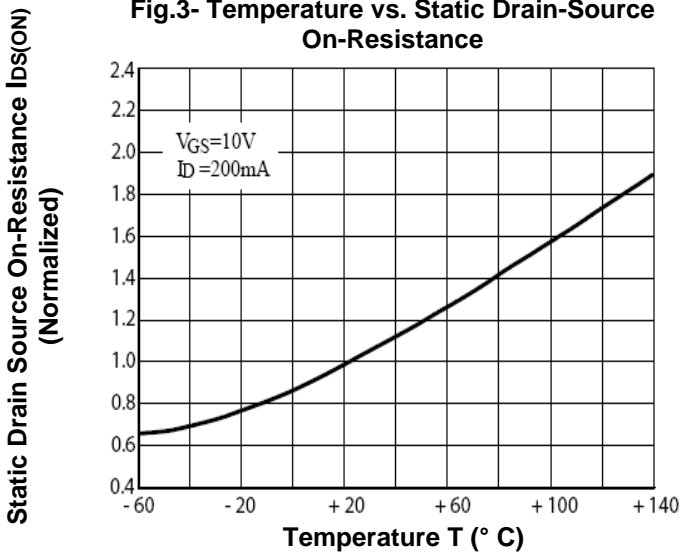
**Fig.2- Transfer Characteristics**



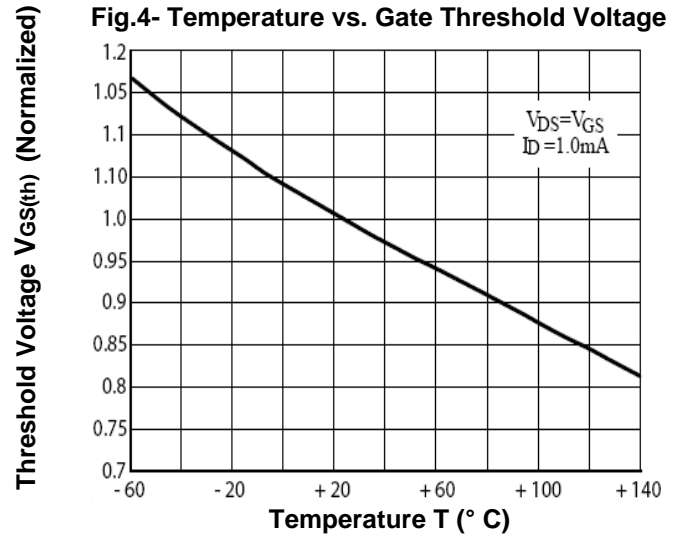
# SMD Power MOSFET Transistor (N-Channel)

**BSS123**

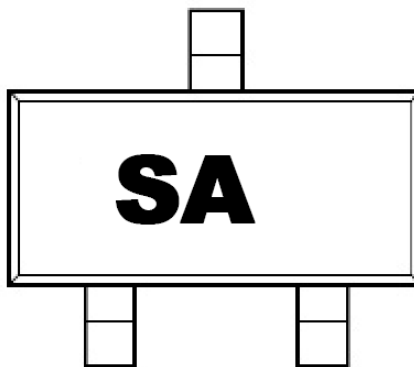
**Fig.3- Temperature vs. Static Drain-Source On-Resistance**



**Fig.4- Temperature vs. Gate Threshold Voltage**



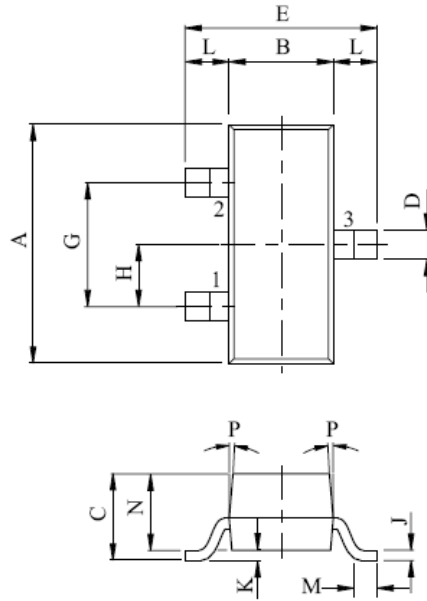
## Marking Information:



# SMD Power MOSFET Transistor (N-Channel)

**BSS123**

## Dimensions in mm



| DIM | MILLIMETERS     |
|-----|-----------------|
| A   | 2.93±0.20       |
| B   | 1.30+0.20/-0.15 |
| C   | 1.30 MAX        |
| D   | 0.45+0.15/-0.05 |
| E   | 2.40+0.30/-0.20 |
| G   | 1.90            |
| H   | 0.95            |
| J   | 0.13+0.10/-0.05 |
| K   | 0.00 ~ 0.10     |
| L   | 0.55            |
| M   | 0.20 MIN        |
| N   | 1.00+0.20/-0.10 |
| P   | 7°              |

1. Source
2. Gate
3. Drain

**SOT-23**

## Ordering Information

**BSS123 – 78 – RG70**

Packing Code:  
RG70: 7" reel in Tape and Reel,  
Lead free and Halogen free

Factory Location Code

SMD Power MOSFET  
Transistor (N-Channel)

# SMD Power MOSFET Transistor (N-Channel)

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**BSS123**

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