

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 100V          | 6Ω@10V          | 0.17A |
|               | 10Ω@4.5V        |       |

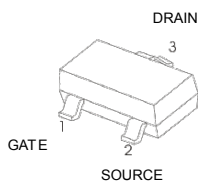
### FEATURE

- Surface Mount Package
- High Density Cell Design for Extremely Low  $R_{DS(on)}$
- Voltage Controlled Small Signal Switch
- Rugged and Reliable

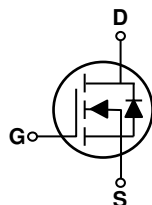
### APPLICATION

- Small Servo Motor Controls
- Power MOSFET Gate Drivers
- Switching Application

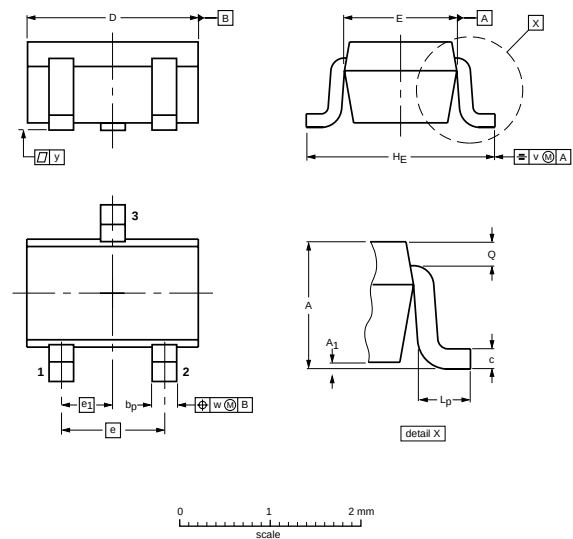
### MARKING : K23



SOT-323



### SOT-323



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub><br>max | b <sub>p</sub> | c            | D          | E            | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | Q            | v   | w   |
|------|------------|-----------------------|----------------|--------------|------------|--------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm   | 1.1<br>0.8 | 0.1                   | 0.4<br>0.3     | 0.25<br>0.10 | 2.2<br>1.8 | 1.35<br>1.15 | 1.3 | 0.65           | 2.2<br>2.0     | 0.45<br>0.15   | 0.23<br>0.13 | 0.2 | 0.2 |

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

| Parameter                                                        | Symbol          | Value    | Unit                 |
|------------------------------------------------------------------|-----------------|----------|----------------------|
| <b>N-MOSFET</b>                                                  |                 |          |                      |
| Drain-Source Voltage                                             | $V_{DS}$        | 100      | V                    |
| Gate-Source Voltage                                              | $V_{GS}$        | ±20      | V                    |
| Continuous Drain Current (note 1)                                | $I_D$           | 0.17     | A                    |
| Pulsed Drain Current ( $t_p=10\mu\text{s}$ )                     | $I_{DM}$        | 0.68     | A                    |
| Continuous Source-Drain Diode Current                            | $I_S$           | 0.17     | A                    |
| Power Dissipation                                                | $P_D$           | 0.35     | W                    |
| Thermal Resistance from Junction to Ambient (note 1)             | $R_{\theta JA}$ | 357      | $^{\circ}\text{C/W}$ |
| Junction Temperature                                             | $T_J$           | 150      | $^{\circ}\text{C}$   |
| Storage Temperature                                              | $T_{STG}$       | -55~+150 | $^{\circ}\text{C}$   |
| Lead Temperature for Soldering Purposes(1/8" from case for 10 s) | $T_L$           | 260      | $^{\circ}\text{C}$   |

# BSS123W

## MOSFET ELECTRICAL CHARACTERISTICS

T<sub>a</sub>=25 °C unless otherwise specified

| Parameter                            | Symbol               | Test Condition                                                                              | Min | Typ  | Max  | Unit |
|--------------------------------------|----------------------|---------------------------------------------------------------------------------------------|-----|------|------|------|
| STATIC CHARACTERISTICS               |                      |                                                                                             |     |      |      |      |
| Drain-source breakdown voltage       | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                                 | 100 |      |      | V    |
| Zero gate voltage drain current      | I <sub>DSS</sub>     | V <sub>DS</sub> =100V, V <sub>GS</sub> = 0V                                                 |     |      | 1    | μA   |
|                                      |                      | V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V                                                  |     |      | 10   | nA   |
| Gate-body leakage current            | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V                                                 |     |      | ±50  | nA   |
| Gate threshold voltage (note 2)      | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                    | 1   | 1.6  | 2.8  | V    |
| Drain-source on-resistance(note 2)   | R <sub>DS(on)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.17A                                                |     | 3.8  | 10   | Ω    |
|                                      |                      | V <sub>GS</sub> =10V, I <sub>D</sub> =0.17A                                                 |     | 3.5  | 6    | Ω    |
| Forward tranconductance(note 2)      | g <sub>FS</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =170mA                                                 | 80  |      |      | mS   |
| Diode forward voltage                | V <sub>SD</sub>      | I <sub>S</sub> =340mA, V <sub>GS</sub> = 0V                                                 |     |      | 1.3  | V    |
| DYNAMIC CHARACTERISTICS (note 4)     |                      |                                                                                             |     |      |      |      |
| Input Capacitance                    | C <sub>iss</sub>     | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz                                          |     | 29   | 60   | pF   |
| Output Capacitance                   | C <sub>oss</sub>     |                                                                                             |     | 10   | 15   | pF   |
| Reverse Transfer Capacitance         | C <sub>rss</sub>     |                                                                                             |     | 2    | 6    | pF   |
| SWITCHING CHARACTERISTICS (note 3,4) |                      |                                                                                             |     |      |      |      |
| Turn-on delay time                   | t <sub>d(on)</sub>   | V <sub>GS</sub> =10V, V <sub>DD</sub> =30V,<br>I <sub>D</sub> =2.8A, R <sub>GEN</sub> =50 Ω |     |      | 8    | ns   |
| Turn-on rise time                    | t <sub>r</sub>       |                                                                                             |     |      | 8    | ns   |
| Turn-off delay time                  | t <sub>d(off)</sub>  |                                                                                             |     |      | 13   | ns   |
| Turn-off fall time                   | t <sub>f</sub>       |                                                                                             |     |      | 16   | ns   |
| Total Gate Charge                    | Q <sub>g</sub>       | V <sub>DS</sub> =10V, I <sub>D</sub> =0.22A,<br>V <sub>GS</sub> =10V                        |     | 1.4  | 2    | nC   |
| Gate-Source Charge                   | Q <sub>gs</sub>      |                                                                                             |     | 0.15 | 0.25 | nC   |
| Gate-Drain Charge                    | Q <sub>gd</sub>      |                                                                                             |     | 0.2  | 0.4  | nC   |

### Notes :

- 1.Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300μs, duty cycle≤2%.
3. Switching characteristics are independent of operating junction temperature.
4. Garanted by design, not subject to producting.

## RATING AND CHARACTERISTIC CURVES (BSS123W)

