

# BSS123K

100V N Channel  
Advanced Power MOSFET

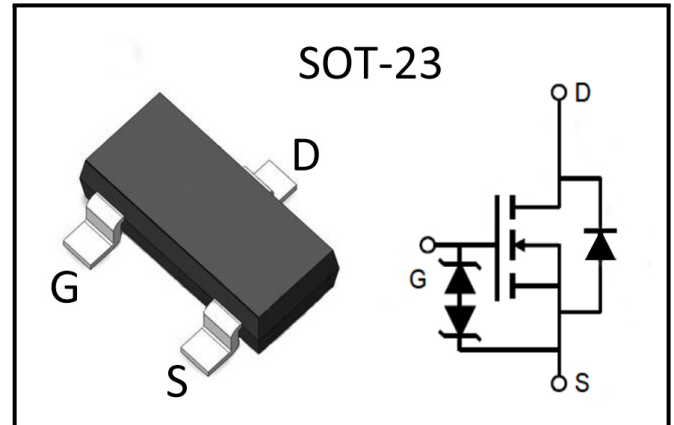
## Features

- $V_{DS}=100V$
- $I_D=0.2A$
- $R_{DS(ON)}@V_{GS}=10V, TYP=2.2\Omega$
- $R_{DS(ON)}@V_{GS}=4.5V, TYP=2.5\Omega$

## Applications

- Relay Driver
- ON/OFF Switch
- High-speed line Driver
- Power Management in Portable and Battery etc.

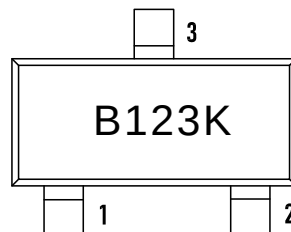
## Package



## General Description

- Advanced trench process technology
- Pb-Free, RoHS Compliant
- High Density Cell Design For Ultra Low On-Resistance
- SOT-23 for Surface Mount Package.
- ESD Protection: 2KV

## Marking



## Ordering information

| Order code | Package | Marking | Base qty | Delivery mode |
|------------|---------|---------|----------|---------------|
| BSS123K    | SOT-23  | B123K   | 3K       | Tape and reel |



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Absolute Maximum Ratings (@ $T_A=25^{\circ}\text{C}$  unless otherwise noted)

| Symbol          | Parameter                                        |                          | Value       | Unit                 |
|-----------------|--------------------------------------------------|--------------------------|-------------|----------------------|
| $V_{(BR)DSS}$   | Drain-Source Voltage                             |                          | 100         | V                    |
| $V_{GS}$        | Gate-Source Voltage                              |                          | $\pm 20$    | V                    |
| $I_D$           | Continuous Drain Current( $V_{GS}=4.5\text{V}$ ) | $T_A=25^{\circ}\text{C}$ | 0.2         | A                    |
|                 |                                                  | $T_A=70^{\circ}\text{C}$ | 0.15        |                      |
| $I_{DM}$        | Pulsed Drain Current <sup>(1)</sup>              | $T_A=25^{\circ}\text{C}$ | 0.8         | A                    |
| $P_D$           | Maximum Power Dissipation                        | $T_A=25^{\circ}\text{C}$ | 0.8         | W                    |
|                 |                                                  | $T_A=70^{\circ}\text{C}$ | 0.6         |                      |
| $T_J$           | Operation Junction Temperature                   |                          | 150         | $^{\circ}\text{C}$   |
| $T_{stg}$       | Storage Temperature Range                        |                          | -55 to +150 | $^{\circ}\text{C}$   |
| $R_{\theta JA}$ | Thermal Resistance From Junction To Ambient      |                          | 150         | $^{\circ}\text{C/W}$ |



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Electrical Characteristics @ $T_A=25^{\circ}\text{C}$  unless otherwise noted

| Symbol                                                                             | Parameter                                       | Test Condition                                                                                   | Min. | Typ. | Max. | Unit |
|------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------|------|------|------|------|
| Static Electrical Characteristics @T <sub>J</sub> =25°C (unless otherwise stated)  |                                                 |                                                                                                  |      |      |      |      |
| V <sub>(BR)DSS</sub>                                                               | Drain-Source Breakdown Voltage                  | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                                       | 100  | —    | —    | V    |
| I <sub>DSS</sub>                                                                   | Zero Gate Voltage Drain Current                 | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>A</sub> =25°C                                 | —    | —    | 1    | uA   |
|                                                                                    |                                                 | V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>A</sub> =125°C                                 | —    | —    | 100  | uA   |
| I <sub>GSS</sub>                                                                   | Gate-Body Leakage Current                       | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                       | —    | —    | ±10  | uA   |
| V <sub>GS(th)</sub>                                                                | Gate Threshold Voltage                          | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                         | 1.0  | 1.7  | 2.5  | V    |
| R <sub>DS(on)</sub>                                                                | Drain-Source On-State Resistance <sup>(2)</sup> | V <sub>GS</sub> =10V, I <sub>D</sub> =0.2A                                                       | —    | 2.2  | 6    | Ω    |
|                                                                                    |                                                 | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.2A                                                      | —    | 2.5  | 8    |      |
| Dynamic Electrical Characteristics @T <sub>J</sub> =25°C (unless otherwise stated) |                                                 |                                                                                                  |      |      |      |      |
| C <sub>iss</sub>                                                                   | Input Capacitance                               | V <sub>DS</sub> =50V,<br>V <sub>GS</sub> =0V,<br>f=1.0MHZ                                        | —    | 11.5 | —    | pF   |
| C <sub>oss</sub>                                                                   | Output Capacitance                              |                                                                                                  | —    | 2.4  | —    |      |
| C <sub>rss</sub>                                                                   | Reverse Transfer Capacitance <sup>(2)</sup>     |                                                                                                  | —    | 1.8  | —    |      |
| Q <sub>g</sub>                                                                     | Total Gate Charge                               | V <sub>DS</sub> =50V,<br>V <sub>GS</sub> =10V,<br>I <sub>D</sub> =0.2A                           | —    | 0.54 | —    | nC   |
| Q <sub>gs</sub>                                                                    | Gate-Source Charge                              |                                                                                                  | —    | 0.08 | —    |      |
| Q <sub>gd</sub>                                                                    | Gate-Drain Charge                               |                                                                                                  | —    | 0.18 | —    |      |
| Switching Characteristics @T <sub>J</sub> =25°C (unless otherwise stated)          |                                                 |                                                                                                  |      |      |      |      |
| t <sub>d(on)</sub>                                                                 | Turn-On Delay Time                              | V <sub>GS</sub> =10V,<br>V <sub>DD</sub> = 50V,<br>I <sub>D</sub> =0.2A,<br>R <sub>G</sub> =3.3Ω | —    | 2    | —    | ns   |
| t <sub>r</sub>                                                                     | Turn-On Rise Time                               |                                                                                                  | —    | 3.1  | —    |      |
| t <sub>d(off)</sub>                                                                | Turn-Off Delay Time                             |                                                                                                  | —    | 6.5  | —    |      |
| t <sub>f</sub>                                                                     | Turn-Off Fall Time                              |                                                                                                  | —    | 15   | —    |      |
| Source Drain Diode Characteristics @T <sub>J</sub> =25°C (unless otherwise stated) |                                                 |                                                                                                  |      |      |      |      |
| I <sub>SD</sub>                                                                    | Source drain current(Body Diode)                | T <sub>A</sub> =25°C                                                                             | —    | —    | 0.2  | A    |
| V <sub>SD</sub>                                                                    | Diode Forward Voltage <sup>(2)</sup>            | T <sub>J</sub> =25°C, I <sub>SD</sub> = 0.2A, V <sub>GS</sub> = 0V                               | —    | 0.85 | 1.2  | V    |

Notes:

(1)Pulse width limited by maximum allowable junction temperature

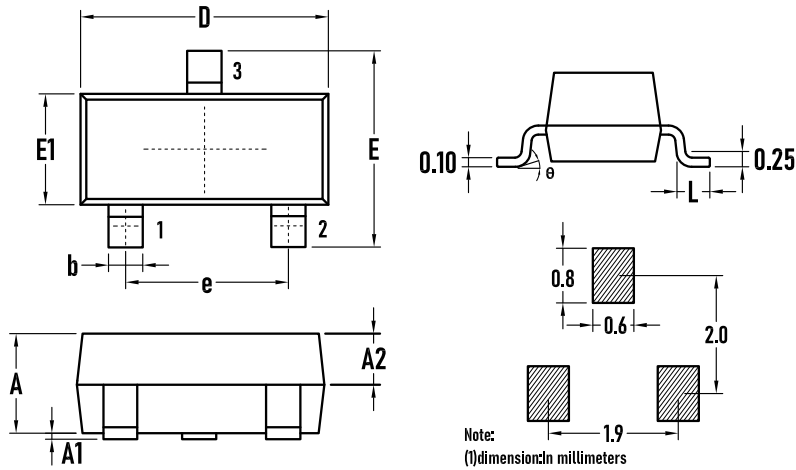
(2)Pulse test:Pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .



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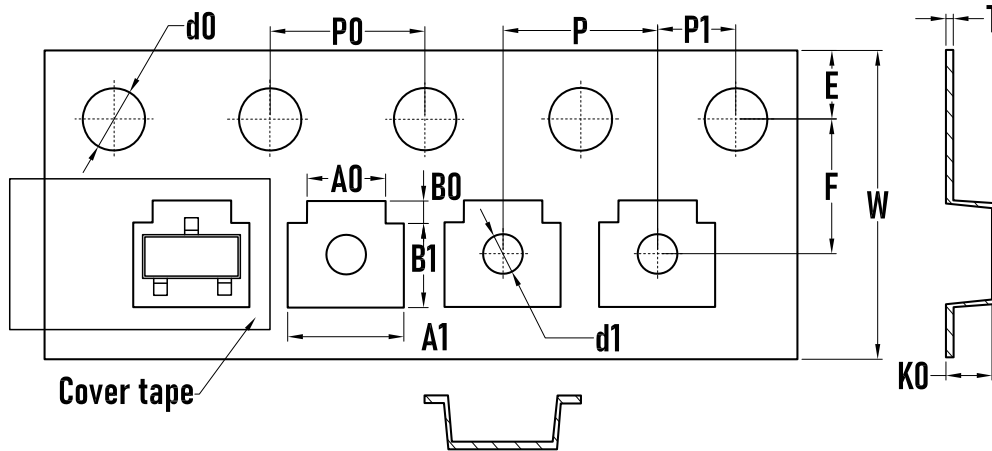
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## Outline Drawing - SOT-23



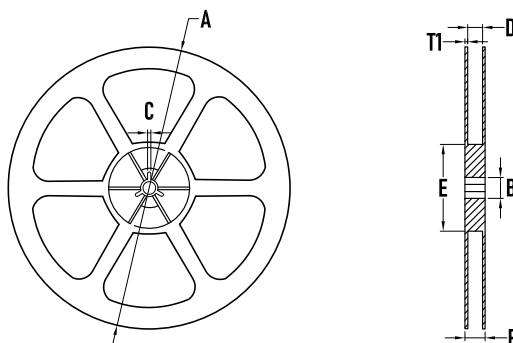
| SYMBOL | MILLIMETER |      |      |
|--------|------------|------|------|
|        | MIN.       | Typ. | MAX. |
| A      | 0.90       | 1.00 | 1.10 |
| A1     | 0.01       | —    | 0.10 |
| A2     | 0.50       | 0.60 | 0.70 |
| D      | 2.80       | 2.90 | 3.00 |
| b      | 0.25       | 0.35 | 0.45 |
| E      | 2.10       | 2.30 | 2.50 |
| E1     | 1.20       | 1.30 | 1.40 |
| e      | 1.80       | 1.90 | 2.00 |
| L      | 0.25       | 0.35 | 0.45 |
| θ      | 0          | —    | 8°   |

## Packaging Tape - SOT-23



| SYMBOL | MILLIMETER |
|--------|------------|
| A0     | 2.10±0.10  |
| A1     | 3.10±0.10  |
| B0     | 0.65±0.10  |
| B1     | 2.75±0.10  |
| d0     | 1.55±0.10  |
| d1     | 1.00±0.05  |
| E      | 1.75±0.10  |
| F      | 3.50±0.10  |
| K0     | 1.10±0.10  |
| P      | 4.00±0.10  |
| P0     | 4.00±0.10  |
| P1     | 2.00±0.10  |
| W      | 8.00±0.30  |
| T      | 0.20 ±0.05 |

## Packaging Reel



| SYMBOL   | MILLIMETER |
|----------|------------|
| A        | 177.8±0.2  |
| B        | 3.1        |
| C        | 13.50      |
| D        | 9.6±0.3    |
| E        | 75±0.2     |
| F        | 12.3±0.3   |
| T1       | 1.0±0.2    |
| Quantity | 3000PCS    |

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Specifications are subject to change without notice.

Please refer to <http://www.born-tw.com> for current information.

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