



## Description

The BSS123-7-F uses advanced trench technology to provide excellent  $R_{DS(ON)}$ . This device is suitable for use as a load switch or in PWM applications.

## General Features

$V_{DS} = 100V, I_D = 0.17A$

$R_{DS(ON)} < 6 \Omega @ V_{GS} = 10V$

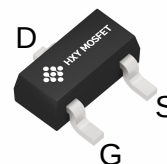
ESD Rating: 1500V HBM

## Application

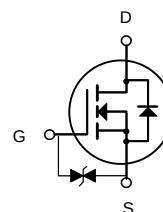
Battery protection

Load switch

Uninterruptible power supply



**SOT-23**



N-Channel MOSFET

## Package Marking and Ordering Information

| Product ID | Pack   | Marking | Qty(PCS) |
|------------|--------|---------|----------|
| BSS123     | SOT-23 | SA      | 3000     |

## Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Symbol          | Parameter                                        | Limit      | Unit |
|-----------------|--------------------------------------------------|------------|------|
| $V_{DS}$        | Drain-Source Voltage                             | 100        | V    |
| $V_{GS}$        | Gate-Source Voltage                              | $\pm 20$   | V    |
| $I_D$           | Drain Current-Continuous                         | 0.17       | A    |
| $I_{DM}$        | Drain Current-Pulsed (Note 1)                    | 0.68       | A    |
| $P_D$           | Maximum Power Dissipation                        | 0.35       | W    |
| $T_J, T_{STG}$  | Operating Junction and Storage Temperature Range | -55 To 150 | °C   |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 350        | °C/W |



Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

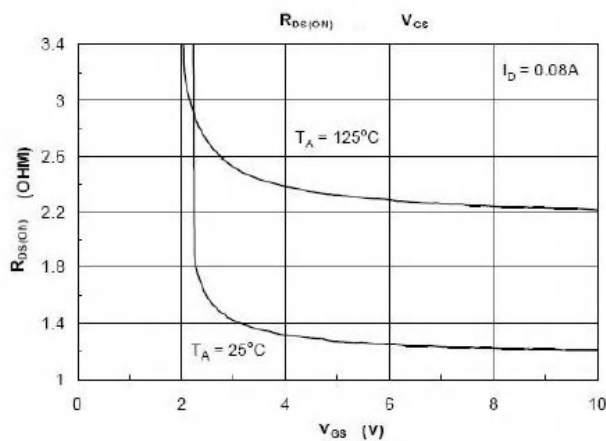
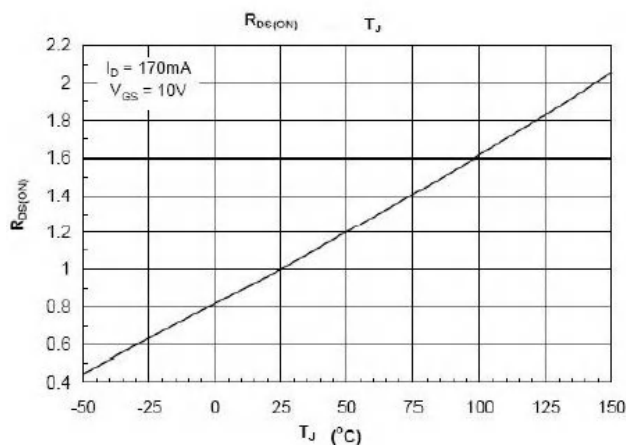
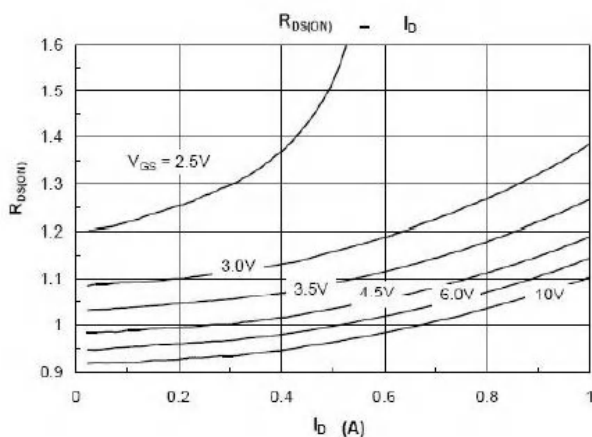
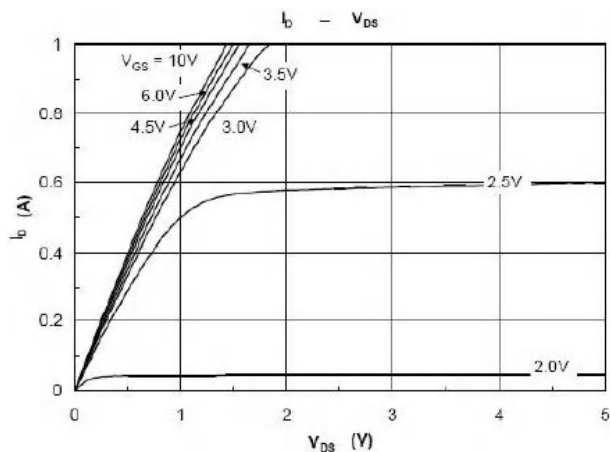
| Symbol                 | Parameter                                 | Test conditions                                                                          | M n | Typ | Max | Unit |
|------------------------|-------------------------------------------|------------------------------------------------------------------------------------------|-----|-----|-----|------|
| Static                 |                                           |                                                                                          |     |     |     |      |
| V <sub>(BR)DSS</sub>   | Drain-source breakdown voltage            | V <sub>GS</sub> =0, I <sub>D</sub> =250μA                                                | 100 |     |     | V    |
| V <sub>GS(th)</sub>    | Gate threshold voltage                    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 1.5 |     | 2.5 | V    |
| I <sub>GSS</sub>       | Gate-body leakage current                 | V <sub>DS</sub> =0, V <sub>GS</sub> =±20V                                                |     |     | ±10 | μA   |
| I <sub>DSS</sub>       | Zero gate voltage drain current           | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V                                               |     |     | 1   | μA   |
| R <sub>DS(on)</sub>    | Drain-source on-resistance <sup>a</sup>   | V <sub>GS</sub> =10V, I <sub>D</sub> =0.17A                                              |     |     | 6.0 | Ω    |
|                        |                                           | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.17A                                             |     |     | 9.0 | Ω    |
| V <sub>SD</sub>        | Diode forward voltage                     | I <sub>S</sub> =0.2A,V <sub>GS</sub> =0V                                                 |     |     | 1.0 | V    |
| Dynamic                |                                           |                                                                                          |     |     |     |      |
| C <sub>iss</sub>       | Input capacitance                         | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz                                        |     | 30  |     | pF   |
| C <sub>oss</sub>       | Output capacitance                        |                                                                                          |     | 10  |     |      |
| C <sub>rss</sub>       | Reverse transfer capacitance <sup>b</sup> |                                                                                          |     | 7   |     |      |
| Switching <sup>b</sup> |                                           |                                                                                          |     |     |     |      |
| t <sub>d(on)</sub>     | Turn-on delay time                        | V <sub>GS</sub> =10V,V <sub>DS</sub> =50V<br>I <sub>D</sub> =200mA, R <sub>GEN</sub> =6Ω |     | 1.7 |     | nS   |
| t <sub>r</sub>         | Rise time                                 |                                                                                          |     | 9   |     |      |
| t <sub>d(off)</sub>    | Turn-off delay time                       |                                                                                          |     | 17  |     |      |
| t <sub>f</sub>         | Fall time                                 |                                                                                          |     | 7   |     |      |

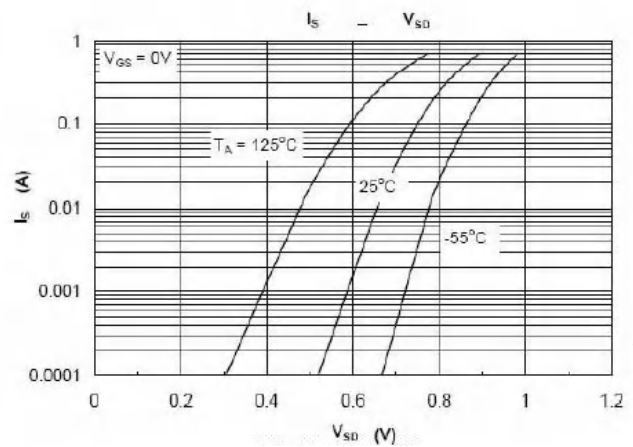
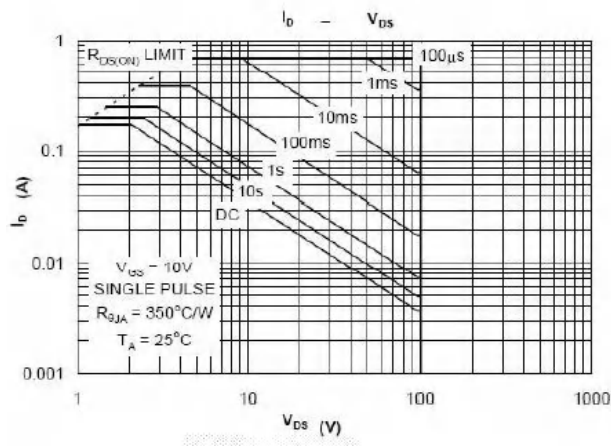
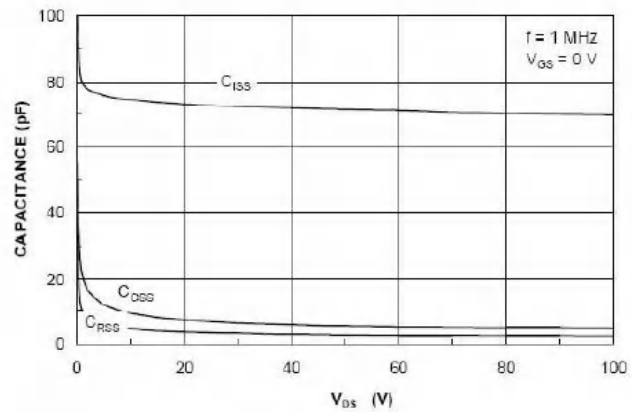
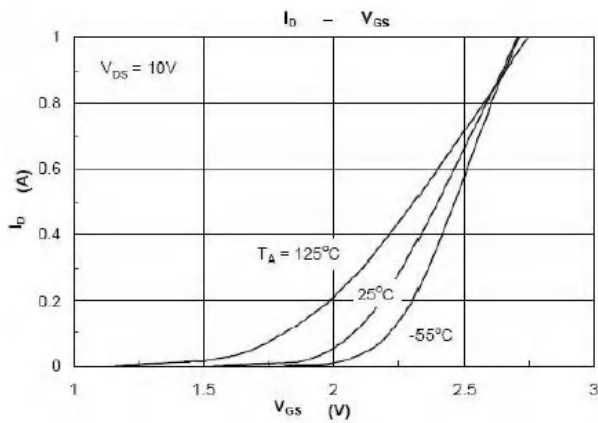
Notes :

a. Pulse Test : Pulse width≤300μs, duty cycle ≤2%.

b. Guaranteed by design, not subject to producing.

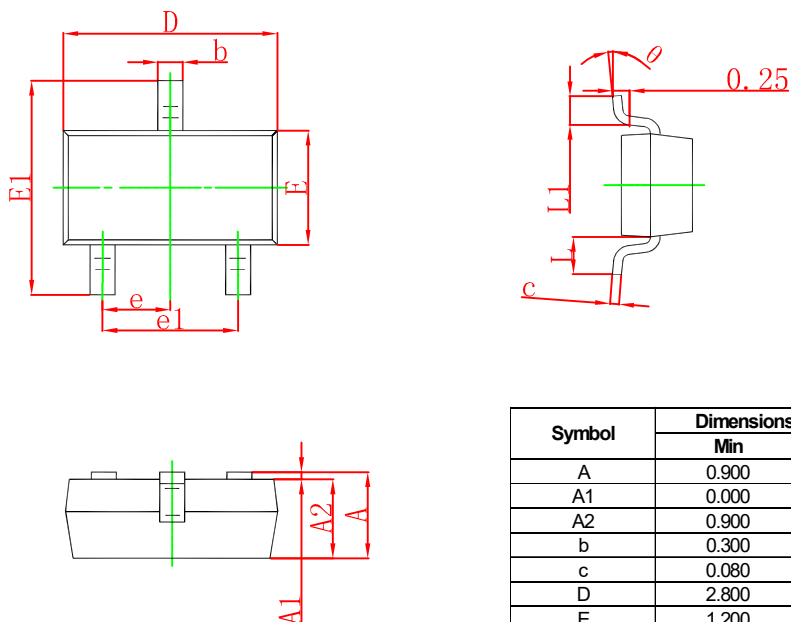
Typical Characteristics





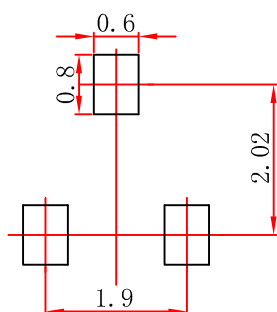


## SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23 Suggested Pad Layout



Note:  
1. Controlling dimension: in millimeters.  
2. General tolerance:  $\pm 0.05\text{mm}$ .  
3. The pad layout is for reference purposes only.



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