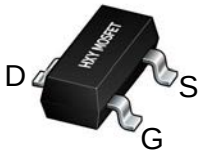
## Description

The BSS138BKW,115 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

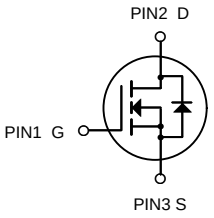



**SOT-323**

## General Features

$V_{DS}$ = 60V $I_D$ =0.115A

$R_{DS(ON)}$ < 3Ω@ $V_{GS}$=10 V




N-Channel MOSFET

## Application

Battery protection

Load switch

Uninterruptible power supply

## Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| BSS138BKW,115 | SOT-323 | 72K | 3000 |

## Absolute Maximum Ratings ($T_A$=25℃unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 60 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ | Drain Current-Continuous | 0.115 | A |
| $P_D$ | Maximum Power Dissipation | 0.2 | W |
| $T_J$,$T_{STG}$ | Operating Junction and Storage Temperature Range | -55 To 150 | ℃ |
| $R_{\theta JA}$ | Thermal Resistance,Junction-to-Ambient (Note 2) | 625 | ℃/W |

## Electrical Characteristics ($T_A$=25℃unless otherwise noted)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0 V, $I_D$=250 μA | 60 | | | V |
| Gate-Threshold Voltage | $V_{(GS)th}$ | $V_{DS}$=$V_{GS}$, $I_D$=250 μA | 1 | 1.6 | 2.5 | |
| Gate-body Leakage | $I_{GSS}$ | $V_{DS}$=0 V, $V_{GS}$=±20 V | | | ±80 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=60 V, $V_{GS}$=0 V | | | 80 | nA |
| On-state Drain Current | $I_{D(on)}$ | $V_{GS}$=10 V, $V_{DS}$=7 V | 500 | | | mA |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10 V, $I_D$=115mA | | 1.3 | 3 | Ω |
| | | $V_{GS}$=4.5V, $I_D$=50mA | | 2 | 5 | |
| Forward Trans conductance | $g_{fs}$ | $V_{DS}$=10 V, $I_D$=200mA | 80 | | | ms |
| Drain-source on-voltage | $V_{DS(on)}$ | $V_{GS}$=10V, $I_D$=500mA | | | 3.75 | V |
| | | $V_{GS}$=5V, $I_D$=50mA | | | 0.375 | V |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=115mA, $V_{GS}$=0 V | 0.55 | | 1.2 | V |
| Input Capacitance * | $C_{iss}$ | $V_{DS}$=25V, $V_{GS}$=0V, f=1MHz | | | 50 | pF |
| Output Capacitance * | $C_{oss}$ | | | | 25 | |
| Reverse Transfer Capacitance * | $C_{rss}$ | | | | 5 | |

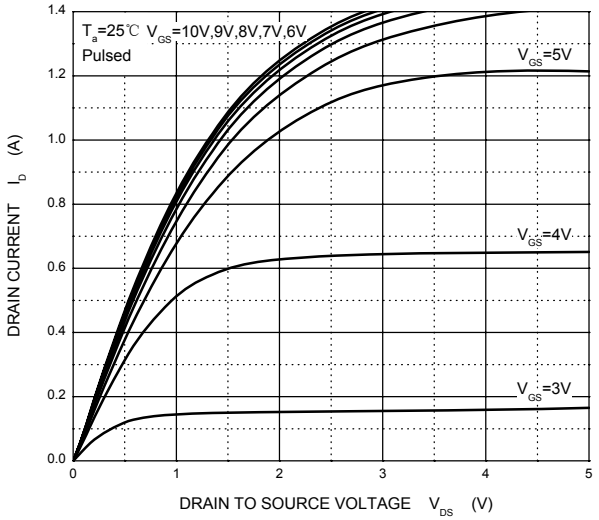
**SWITCHING TIME**

| | | | | | | |
|---|---|---|---|---|---|---|
| Turn-on Time * | $t_{d(on)}$ | $V_{DD}$=25 V, $R_L$=50Ω, $I_D$=500mA,$V_{GEN}$=10 V $R_G$=25Ω | | | 20 | ns |
| Turn-off Time* | $t_{d(off)}$ | | | | 40 | |

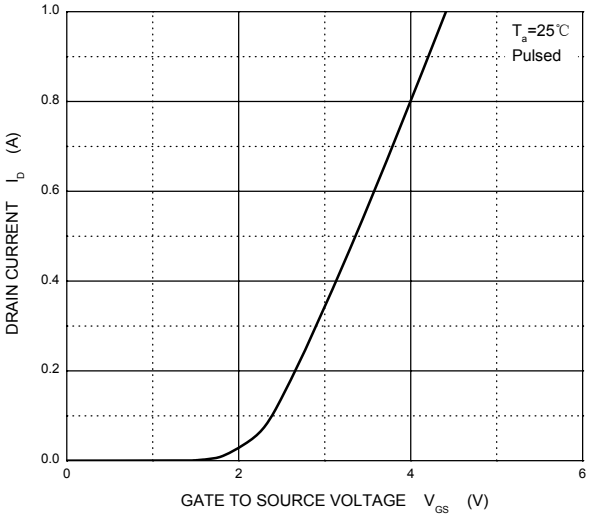
*These parameters have no way to verify.

## Typical Characteristics

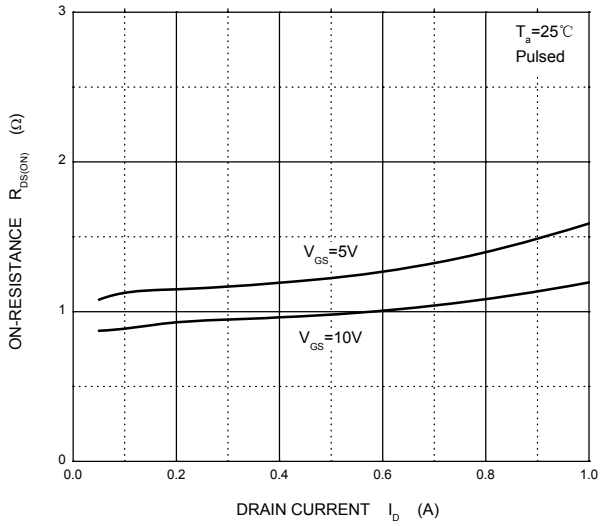
**Output Characteristics**



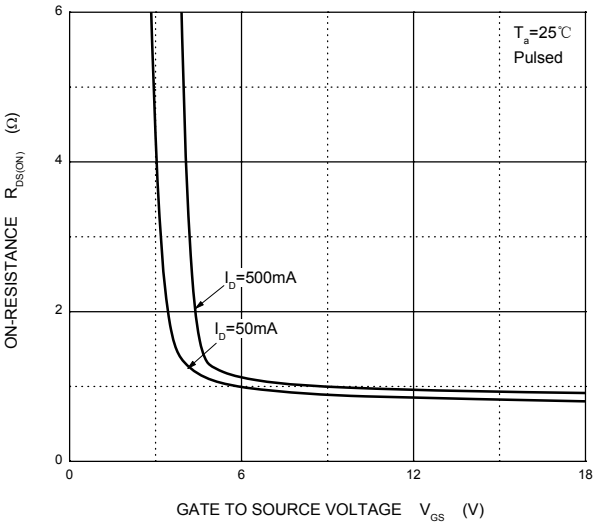

**Transfer Characteristics**



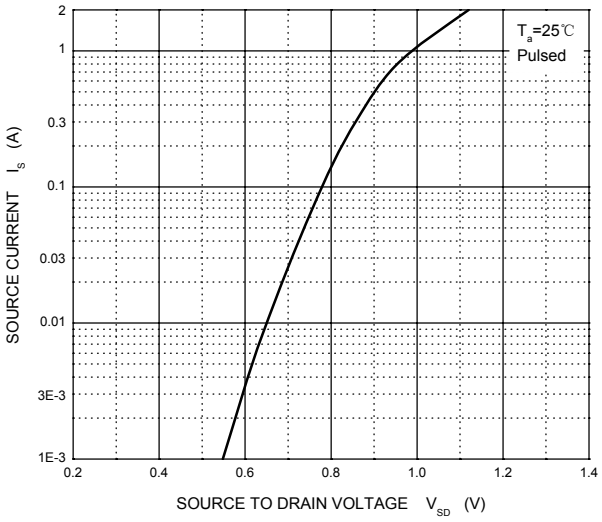

**RDS(ON) — ID**



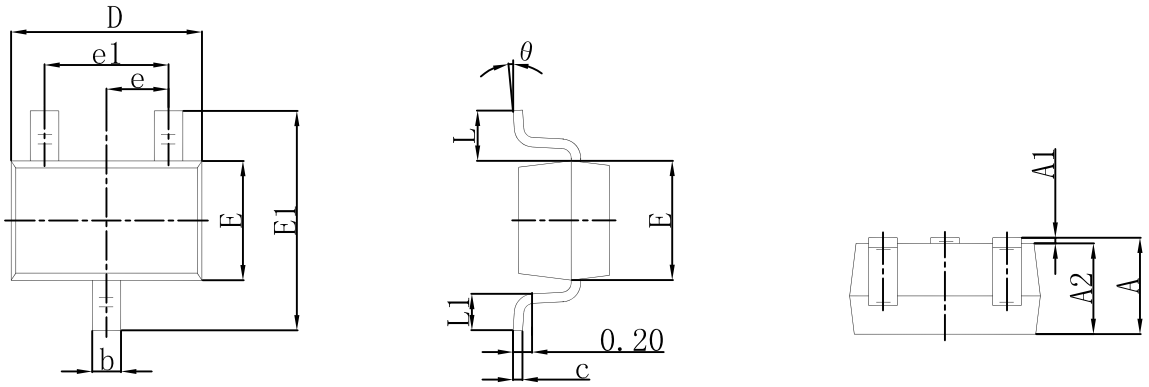

**RDS(ON) — VGS**




**IS — VSD**



## SOT-323 Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650 TYP | | 0.026 TYP | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF | | 0.021 REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| K | 0° | 8° | 0° | 8° |

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