

## BSS84AKW,115(ES)

Rev-1.1

SuperMOS - SOT-323 -60V  $BV_{DSS}$ ,  $3.5\Omega$   $R_{DS(on)}$ , P-channel MOSFET

## 1. Description

The BSS84AKW,115(ES) is P-Channel enhancement MOS Field Effect Transistor. Uses advanced technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product BSS84AKW,115(ES) is Pb-free.

## 2. Features

- -60V,  $R_{DS(ON)}=3.5\Omega$ (Typ.) @ $V_{GS}=-10V$   
 $R_{DS(ON)}=4.5\Omega$ (Typ.) @ $V_{GS}=-4.5V$
- Fast Switching
- High density cell design for low  $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

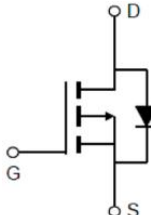
## 3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

## 4. Ordering Information

| Part Number      | Package | Marking | Material     | Packing     | Quantity per reel | Flammability Rating | Reel size |
|------------------|---------|---------|--------------|-------------|-------------------|---------------------|-----------|
| BSS84AKW,115(ES) | SOT-323 | 84KQ    | Halogen free | Tape & Reel | 3,000 PCS         | UL 94V-0            | 7 inches  |

## 5. Pin Configuration and Functions

| Pin | Function | Outline                                                                             | Circuit Diagram                                                                       |
|-----|----------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1   | Gate     |  |  |
| 2   | Source   |                                                                                     |                                                                                       |
| 3   | Drain    |                                                                                     |                                                                                       |

## 6. Specification

### Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

| Parameter                      |                           | Symbol     | Limit       | Unit             |
|--------------------------------|---------------------------|------------|-------------|------------------|
| Drain-Source Voltage           |                           | $BV_{DSS}$ | -60         | V                |
| Gate-Source Voltage            |                           | $V_{GS}$   | $\pm 20$    | V                |
| Continuous Drain Current       | $T_A = 25^\circ\text{C}$  | $I_D$      | -0.18       | A                |
|                                | $T_A = 100^\circ\text{C}$ |            | -0.12       |                  |
| Maximum Power Dissipation      |                           | $P_D$      | 0.30        | W                |
| Pulsed Drain Current           |                           | $I_{DM}$   | -0.74       | A                |
| Operating Junction Temperature |                           | $T_J$      | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range      |                           | $T_{stg}$  | -55 to +150 | $^\circ\text{C}$ |

### Thermal resistance ratings

| Single Operation                       |                 |     |                    |
|----------------------------------------|-----------------|-----|--------------------|
| Parameter                              | Symbol          | Max | Unit               |
| Junction-to-Ambient Thermal Resistance | $R_{\theta JA}$ | 417 | $^\circ\text{C/W}$ |

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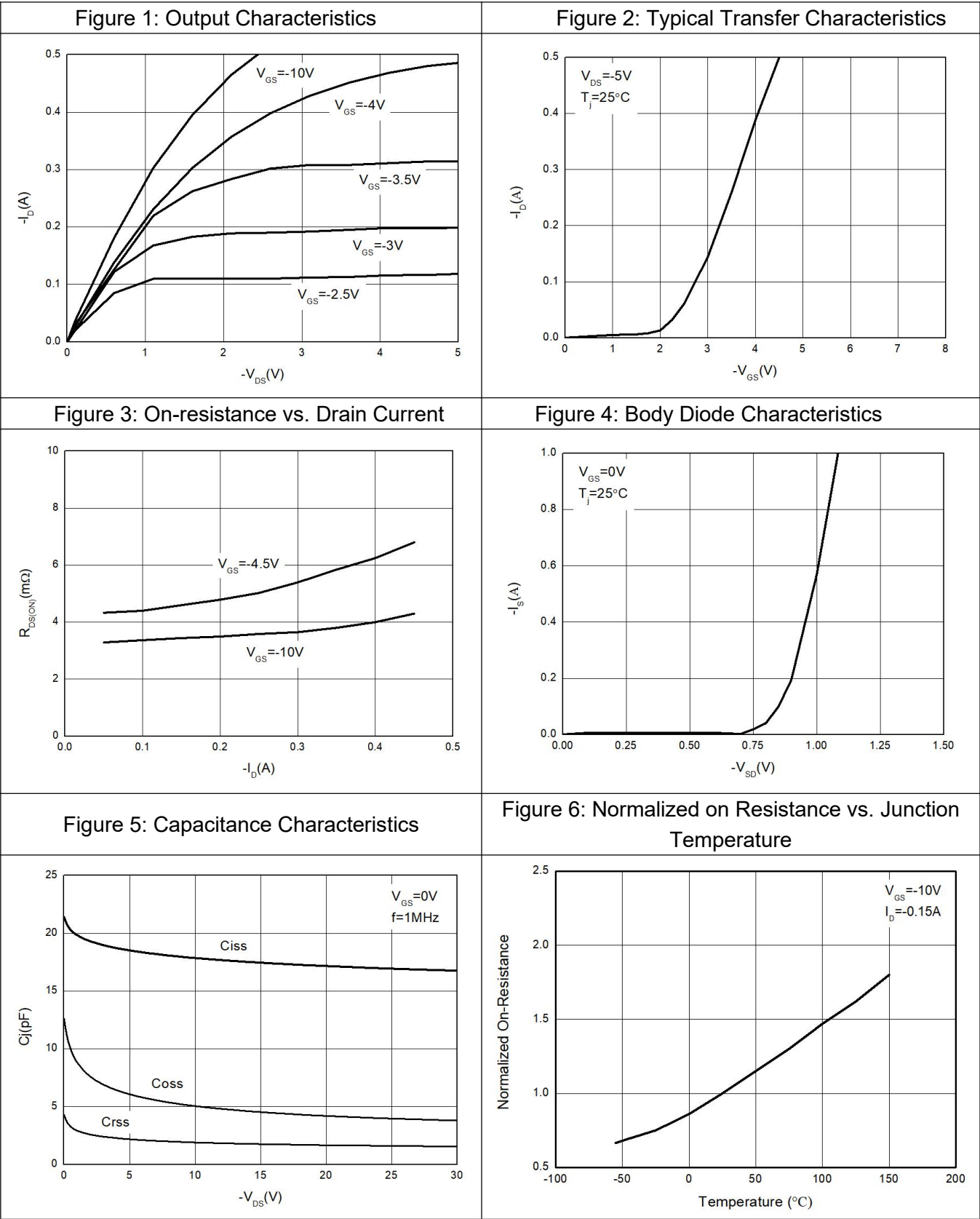
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## Electrical Characteristics

At TA = 25°C unless otherwise specified

| Parameter                         | Symbol              | Test Conditions                                                                           | Min.  | Typ.  | Max. | Unit |
|-----------------------------------|---------------------|-------------------------------------------------------------------------------------------|-------|-------|------|------|
| OFF CHARACTERISTICS               |                     |                                                                                           |       |       |      |      |
| Drain-to-Source Breakdown Voltage | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA                                               | -60   |       |      | V    |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =-60V                                                |       |       | -100 | nA   |
| Gate-to-source Leakage Current    | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                |       |       | ±10  | uA   |
| ON CHARACTERISTICS                |                     |                                                                                           |       |       |      |      |
| Gate Threshold Voltage            | V <sub>GS(TH)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA                                 | -1.1  | -1.6  | -2.2 | V    |
| Drain-to-source On-resistance     | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-0.15A                                             |       | 3.5   | 5.2  | Ω    |
|                                   |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.1A                                             |       | 4.5   | 6.3  |      |
| CHARGES AND CAPACITANCES          |                     |                                                                                           |       |       |      |      |
| Input Capacitance                 | C <sub>ISS</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V<br>f=1MHz                                      |       | 17    |      | pF   |
| Output Capacitance                | C <sub>OSS</sub>    |                                                                                           |       | 4     |      |      |
| Reverse Transfer Capacitance      | C <sub>RSS</sub>    |                                                                                           |       | 1.6   |      |      |
| Total Gate Charge                 | Q <sub>G(TOT)</sub> | V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-25V<br>I <sub>D</sub> =-0.1A                    |       | 1.1   |      | nC   |
| Gate-to-Source Charge             | Q <sub>GS</sub>     |                                                                                           |       | 0.3   |      |      |
| Gate-to-Drain Charge              | Q <sub>GD</sub>     |                                                                                           |       | 0.2   |      |      |
| SWITCHING CHARACTERISTICS         |                     |                                                                                           |       |       |      |      |
| Turn-On Delay Time                | t <sub>d(ON)</sub>  | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-25V<br>I <sub>D</sub> =-0.1A, R <sub>G</sub> =6Ω |       | 4.8   |      | ns   |
| Rise Time                         | t <sub>r</sub>      |                                                                                           |       | 19    |      |      |
| Turn-Off Delay Time               | t <sub>d(OFF)</sub> |                                                                                           |       | 52    |      |      |
| Fall Time                         | t <sub>f</sub>      |                                                                                           |       | 32    |      |      |
| BODY DIODE CHARACTERISTICS        |                     |                                                                                           |       |       |      |      |
| Forward Voltage                   | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>SD</sub> =-0.15A                                              | -0.45 | -0.88 | -1.5 | V    |

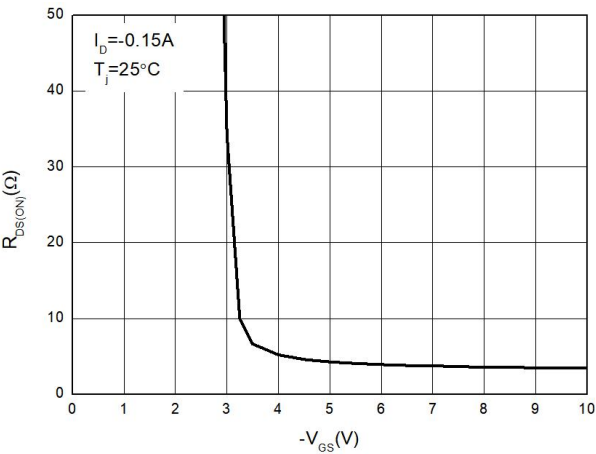
7. Typical Characteristics



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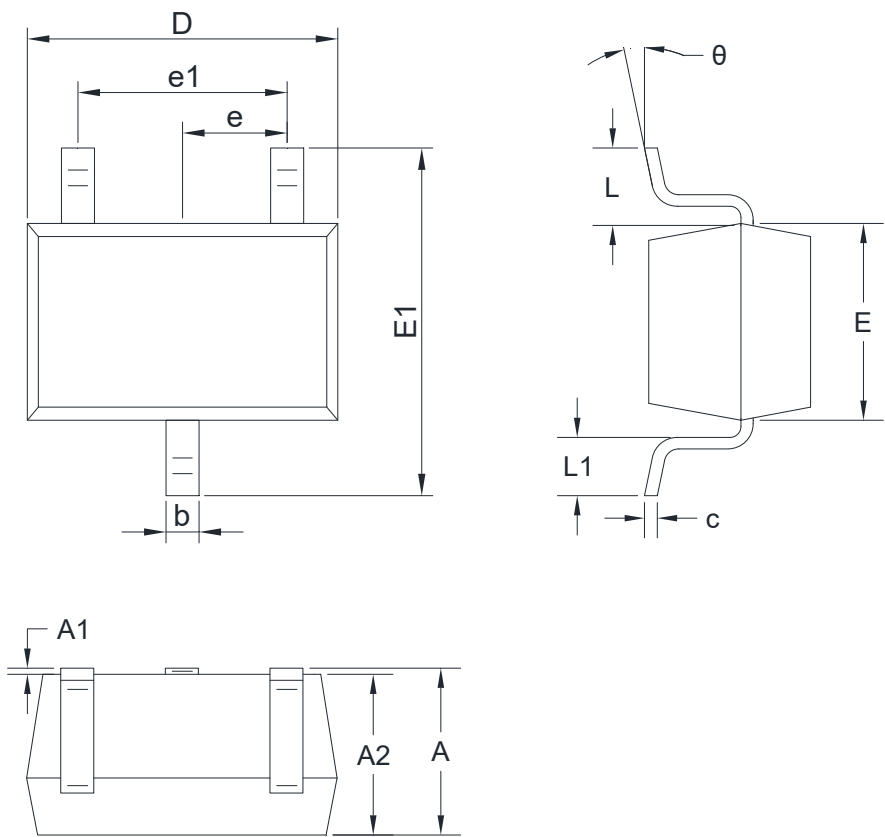
Figure7: on-Resistance vs. Gate to Source



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8. Dimension (SOT-323)



| Symbol | Millimeters |      | Symbol | Millimeters |      |
|--------|-------------|------|--------|-------------|------|
|        | Min         | Max  |        | Min         | Max  |
| A      | 0.80        | 1.00 | E1     | 2.05        | 2.35 |
| A1     | 0.00        | 0.10 | e      | 0.65 TYP    |      |
| A2     | 0.80        | 0.90 | e1     | 1.20        | 1.40 |
| b      | 0.20        | 0.40 | L      | 0.45 REF    |      |
| c      | 0.08        | 0.15 | L1     | 0.26        | 0.46 |
| D      | 2.00        | 2.20 | θ      | 0°          | 8°   |
| E      | 1.15        | 1.35 |        |             |      |

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