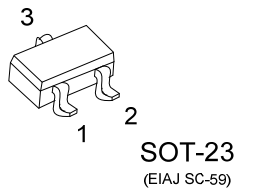
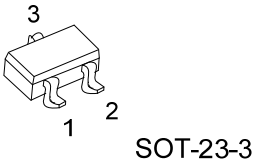
# BSS84Z

**Power MOSFET**

## -0.13A, -50V P-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR




SOT-23
(EIAJ SC-59)




SOT-23-3
(JEDEC TO-236)

### ■ DESCRIPTION

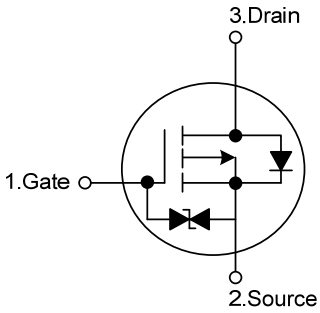
These P-Channel enhancement mode field vertical D-MOS transistors are in a SOT-23-3 SMD package, and in most applications they require up to -0.13A DC and can deliver current up to -0.52A.

This product is particularly suited to low voltage applications requiring a low current high side switch.

### ■ FEATURES

* $R_{DS(ON)} \leq 10\ \Omega$ @ $V_{GS}$=-4.5V, $I_D$=-0.1A

### ■ SYMBOL



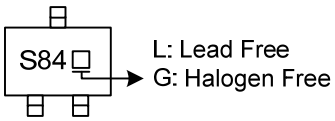

### ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| BSS84ZL-AE2-R | BSS84ZG-AE2-R | SOT-23-3 | G | S | D | Tape Reel |
| BSS84ZL-AE3-R | BSS84ZG-AE3-R | SOT-23 | G | S | D | Tape Reel |

Note: Pin Assignment: G: Gate S: Source D: Drain


(1) R: Tape Reel
(2) AE2: SOT-23-3, AE3: SOT-23
(3) G: Halogen Free and Lead Free, L: Lead Free

### ■ MARKING



## ■ ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | -50 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±20 | V |
| Continuous Drain Current | DC | $I_D$ | -0.13 | A |
| | Pulse | | -0.52 | A |
| Power Dissipation | | $P_D$ | 0.3 | W |
| Junction Temperature | | $T_J$ | +150 | °C |
| Storage Temperature | | $T_{STG}$ | -55 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Junction to Ambient | $\theta_{JA}$ | 416 (Note) | °C/W |

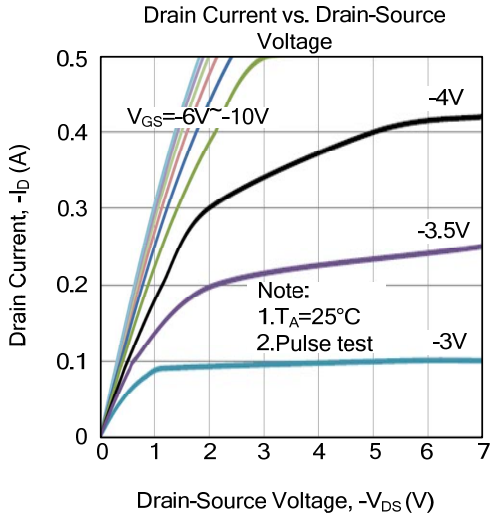
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

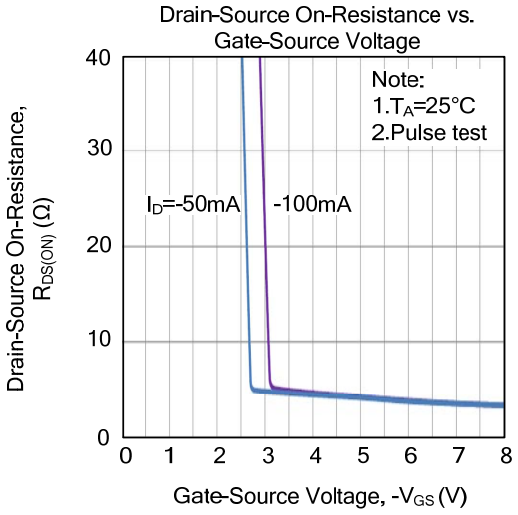
## ■ ELECTRICAL CHARACTERISTICS ($T_A$=25°C, unless otherwise specified)

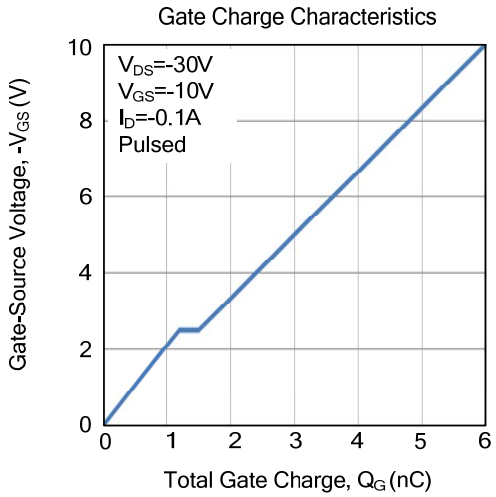
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=-250μA | -50 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-50V, $V_{GS}$=0V | | | -15 | μA |
| Gate–Body Leakage, Forward | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±10 | μA |
| **ON CHARACTERISTICS** (Note) | | | | | | |
| Gate-Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-1mA | -0.8 | -1.7 | -2.5 | V |
| Static Drain–Source On–Resistance | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-0.1A | | | 10 | Ω |
| **DYNAMIC PARAMETERS** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$=-25V, $V_{GS}$=0V, f=1MHz | | 25 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 10 | | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 4.8 | | pF |
| **SWITCHING PARAMETERS** (Note) | | | | | | |
| Total Gate Charge | $Q_G$ | $V_{DS}$=-30V, $V_{GS}$=-10V, $I_D$=-0.1A (Note 1, 2) | | 6 | | nC |
| Gate Source Charge | $Q_{GS}$ | | | 1.2 | | nC |
| Gate Drain Charge | $Q_{GD}$ | | | 0.3 | | nC |
| Turn-ON Delay Time | $t_{D(ON)}$ | $V_{DD}$=-30V, $V_{GS}$=-10V, $I_D$=-0.1A, $R_G$=3Ω (Note 1, 2) | | 1.6 | | ns |
| Turn-ON Rise Time | $t_R$ | | | 20 | | ns |
| Turn-OFF Delay Time | $t_{D(OFF)}$ | | | 28 | | ns |
| Turn-OFF Fall-Time | $t_F$ | | | 32 | | ns |
| **SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS** | | | | | | |
| Max. Diode Forward Current | $I_S$ | | | | -0.13 | A |
| Pulsed Drain-Source Current | $I_{SM}$ | | | | -0.52 | A |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$= 0V, $I_S$=-0.13A (Note) | | -0.8 | -1.2 | V |

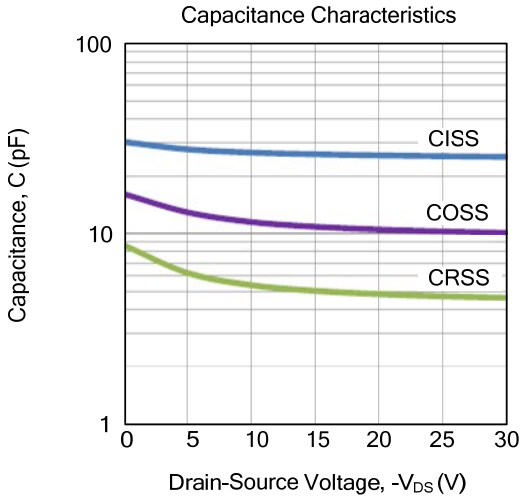
Note: Pulse test, pulse width ≤ 300us, duty cycle ≤ 2%.

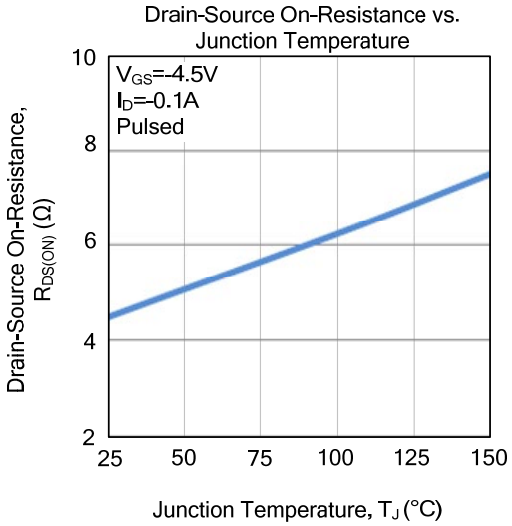
## ■ TYPICAL CHARACTERISTICS

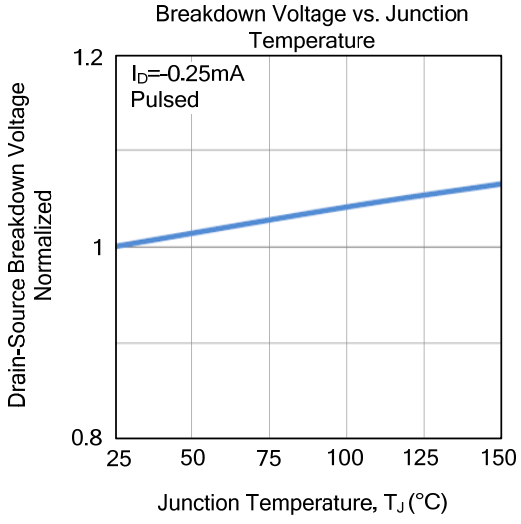


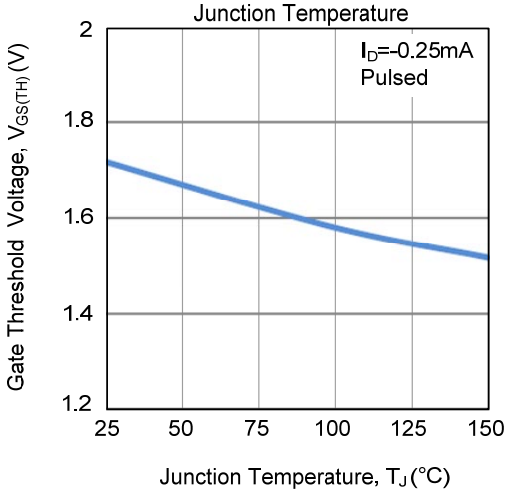



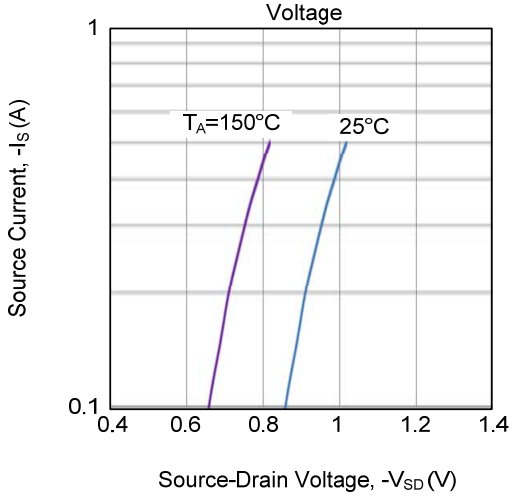



## ■ TYPICAL CHARACTERISTICS (Cont.)

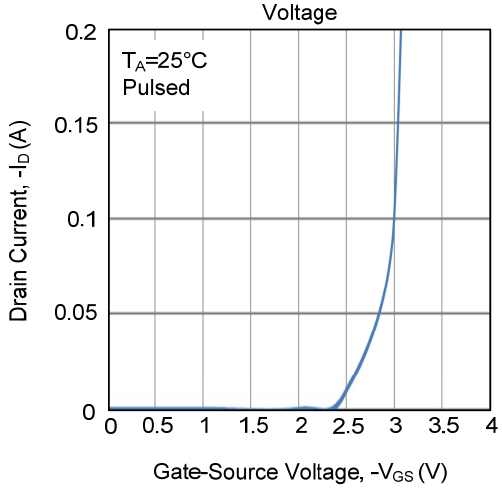
Gate Threshold Voltage vs. Junction Temperature



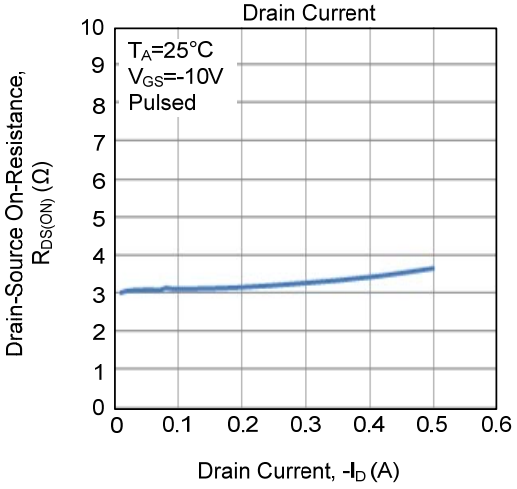

Source Current vs. Source-Drain Voltage



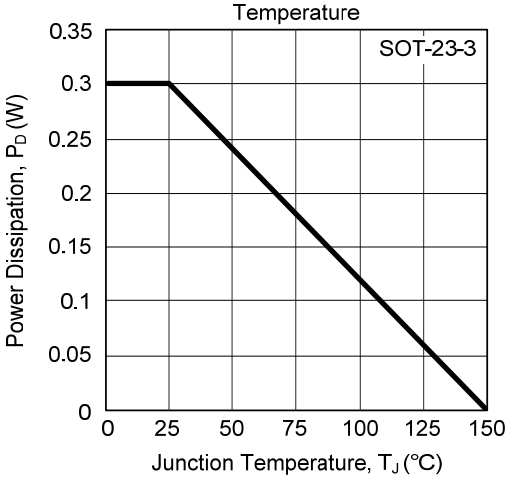

Drain Current vs. Gate-Source Voltage



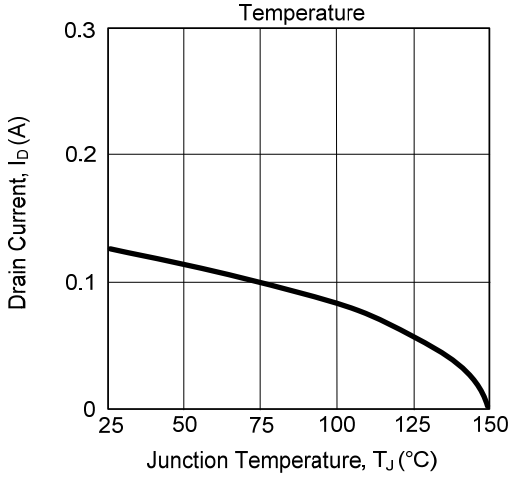

Drain-Source On-Resistance vs. Drain Current




Power Dissipation vs. Junction Temperature




Drain Current vs. Junction Temperature



## ■ TYPICAL CHARACTERISTICS (Cont.)