



## BSS84Z

Power MOSFET

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

#### DESCRIPTION

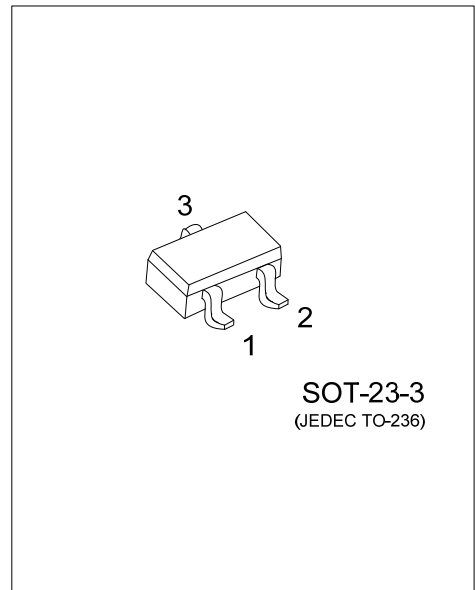
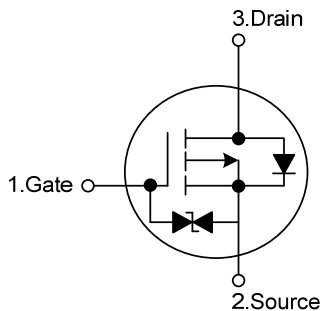
These P-Channel enhancement mode field vertical D-MOS transistors are in a SOT-23-3 SMD package, and in most applications they require up to -0.13A DC and can deliver current up to -0.52A.

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



SOT-23-3  
(JEDEC TO-236)

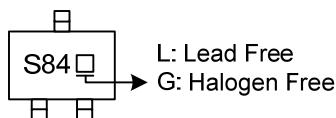
#### ORDERING INFORMATION

| 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 |

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

|               |                  |   |
|---------------|------------------|---|
| BSS84ZG-AE2-R | (1)Packing Type  | (1) R: Tape Reel                                |
|               | (2)Package Type  | (2) AE2: SOT-23-3                               |
|               | (3)Green Package | (3) G: Halogen Free and Lead Free, L: Lead Free |

#### MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

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

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) | $^\circ\text{C/W}$ |

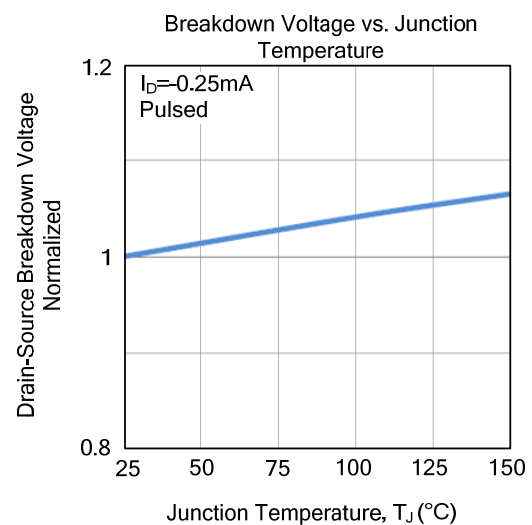
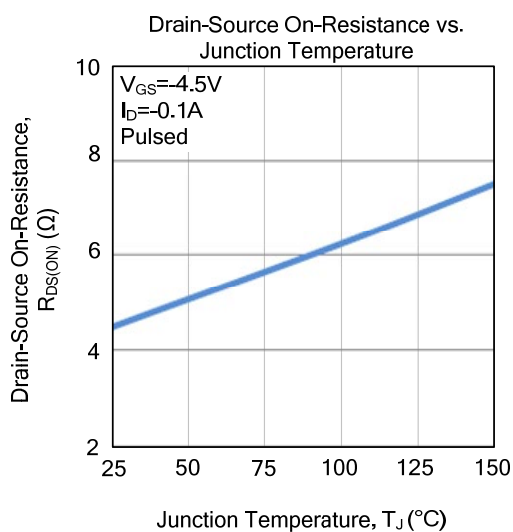
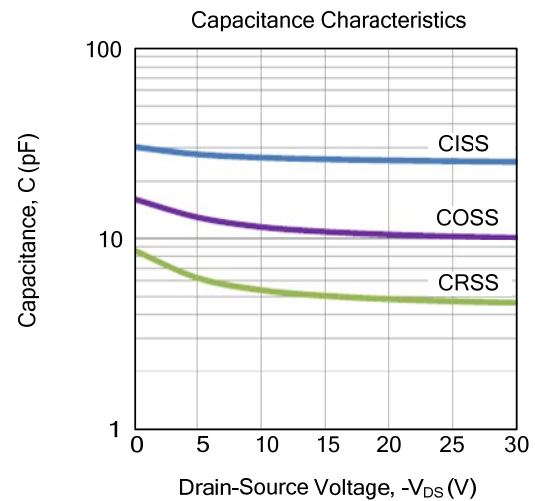
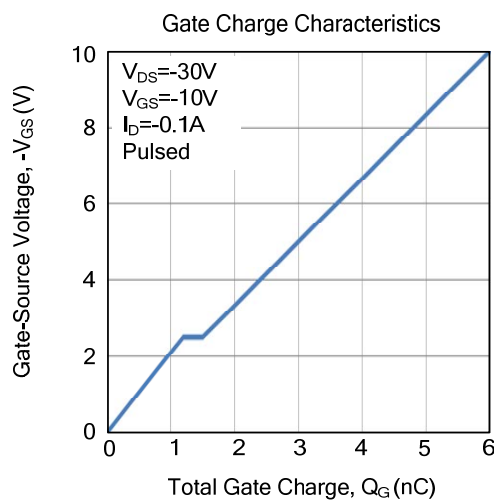
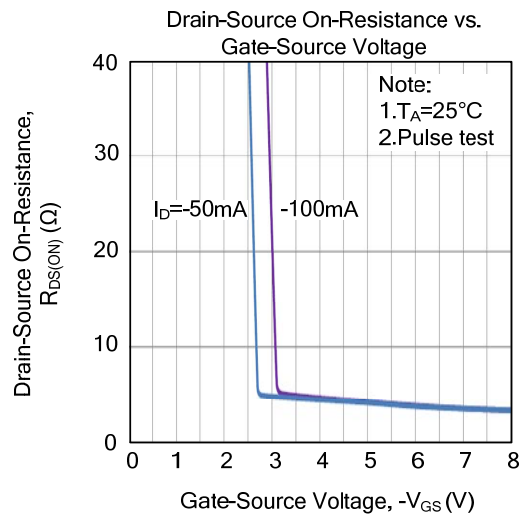
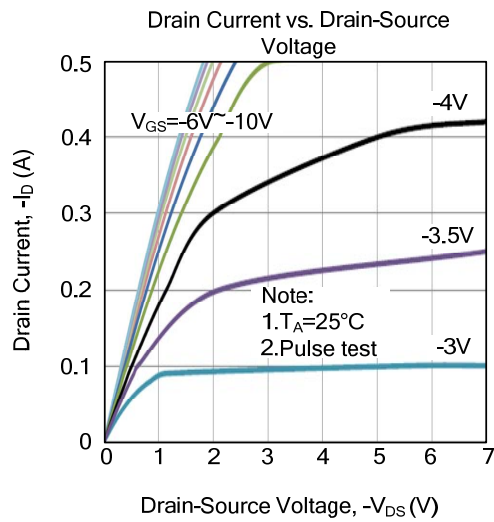
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

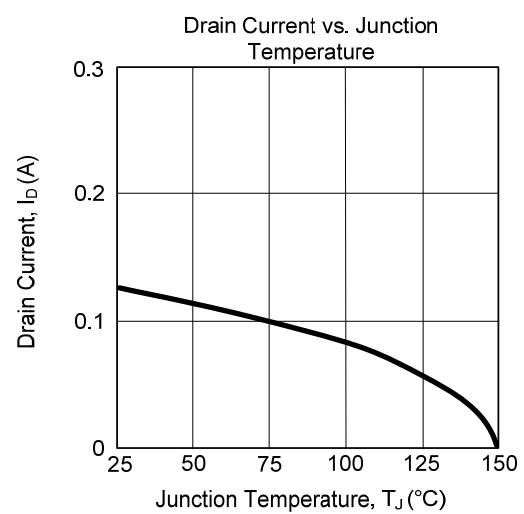
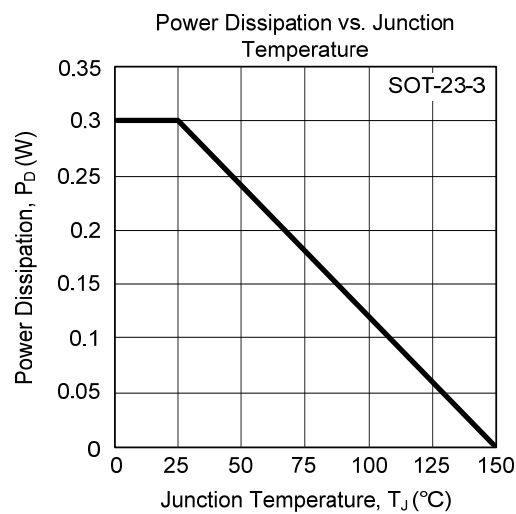
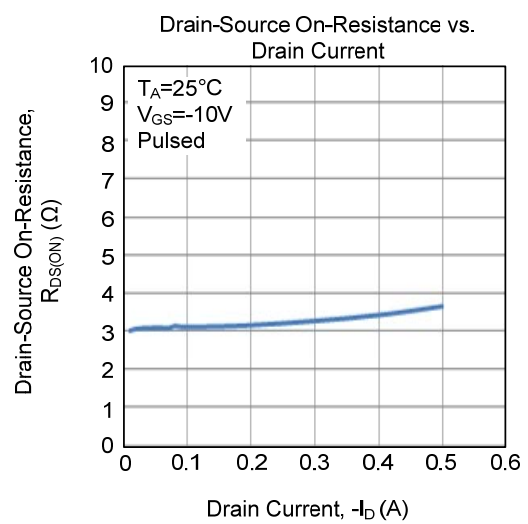
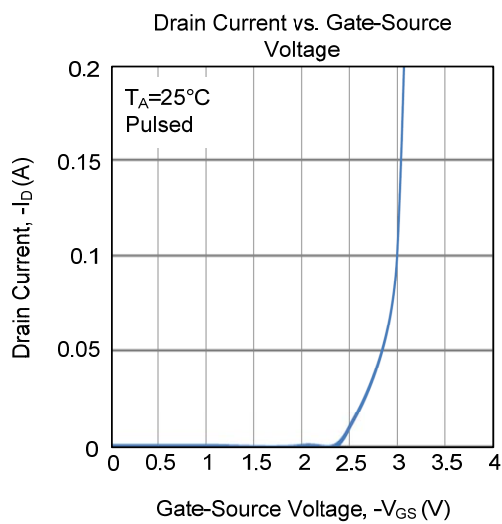
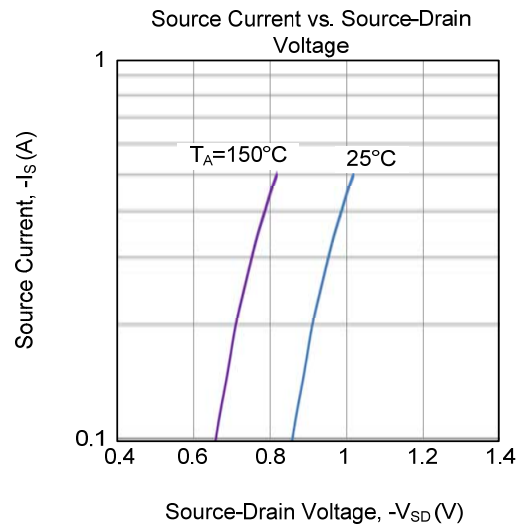
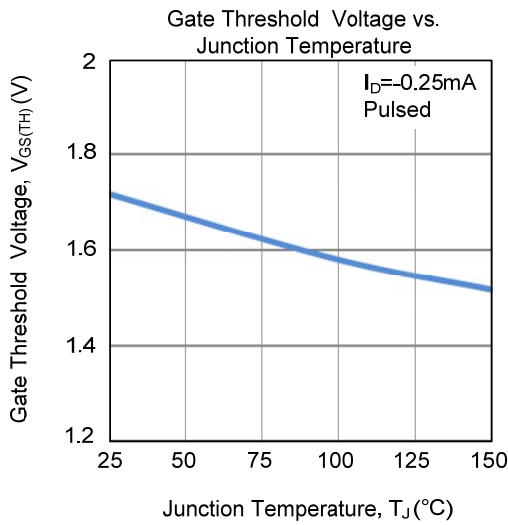
| PARAMETER  | SYMBOL       | TEST CONDITIONS  | MIN  | TYP  | MAX      | UNIT     |
|--|--------------|--|------|------|----------|----------|
| <b>OFF CHARACTERISTICS</b>                             |              |  |      |      |          |          |
| Drain-Source Breakdown Voltage                         | $BV_{DSS}$   | $V_{GS}=0V, I_D=-250\mu A$                                     | -50  |      |          | V        |
| Zero Gate Voltage Drain Current                        | $I_{DSS}$    | $V_{DS}=-50V, V_{GS}=0V$                                       |      |      | -15      | $\mu A$  |
| Gate-Body Leakage, Forward                             | $I_{GSS}$    | $V_{DS}=0V, V_{GS}=\pm 20V$                                    |      |      | $\pm 10$ | $\mu A$  |
| <b>ON CHARACTERISTICS (Note)</b>                       |              |  |      |      |          |          |
| 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       | $\Omega$ |
| <b>DYNAMIC PARAMETERS</b>                              |              |  |      |      |          |          |
| 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       |
| <b>SWITCHING PARAMETERS (Note)</b>                     |              |  |      |      |          |          |
| Total Gate Charge                                      | $Q_G$        | $V_{DS}=-30V, V_{GS}=-10V, I_D=-0.1A, I_G=-1mA$ (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                                     | $t_{D(ON)}$  | $V_{DD}=-30V, V_{GS}=-10V, I_D=-0.1A, R_G=3\Omega$ (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       |
| <b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b> |              |  |      |      |          |          |
| 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  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

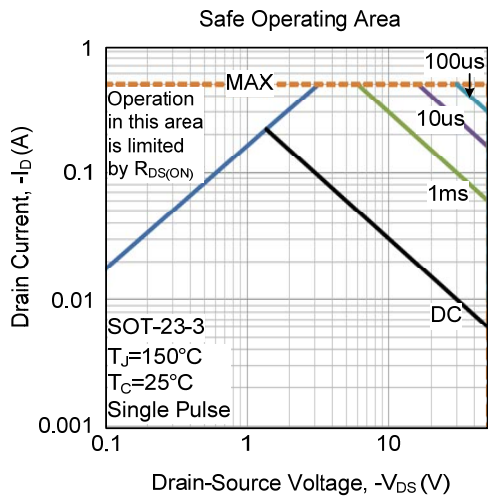
## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



### ■ TYPICAL CHARACTERISTICS (Cont.)



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