

## MOS FIELD EFFECT TRANSISTOR

# 2SJ460

### P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

#### DESCRIPTION

The 2SJ460 is a switching device which can be driven directly by a 2.5 V power source.

The MOS FET has excellent switching characteristics and is suitable for use as a high-speed switching device in digital circuits.

#### FEATURES

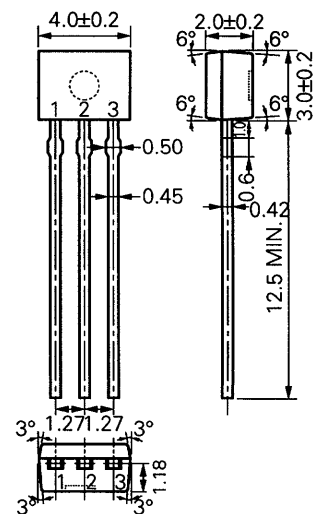
- Can be driven by a 2.5 V power source.
- Not necessary to consider driving current because of its high input impedance.
- Possible to reduce the number of parts by omitting the bias resistor.

#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = +25 °C)

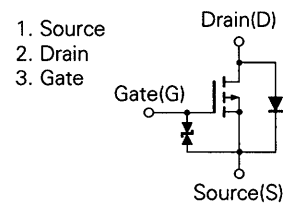
|                         |                       |             |    |
|-------------------------|-----------------------|-------------|----|
| Drain to Source Voltage | V <sub>DSS</sub>      | -50         | V  |
| Gate to Source Voltage  | V <sub>GSS</sub>      | ±7.0        | V  |
| Drain Current (DC)      | I <sub>D(DC)</sub>    | ±0.1        | A  |
| Drain Current (pulse)   | I <sub>D(pulse)</sub> | ±0.2 *      | A  |
| Total Power Dissipation | P <sub>T</sub>        | 250         | mW |
| Channel Temperature     | T <sub>CH</sub>       | 150         | °C |
| Storage Temperature     | T <sub>stg</sub>      | -55 to +150 | °C |

\*PW ≤ 10 ms, Duty cycle ≤ 1 %

#### PACKAGE DRAWINGS (in millimeter)



#### EQUIVALENT CIRCUIT



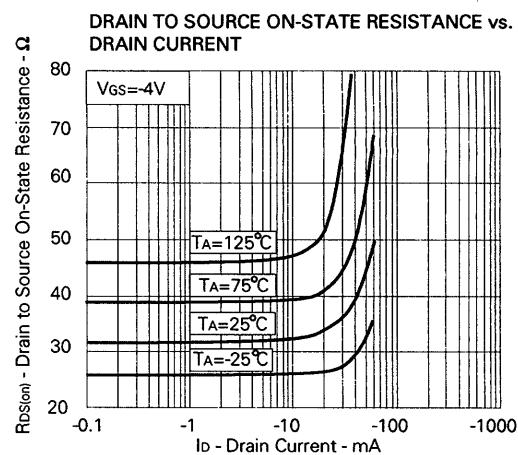
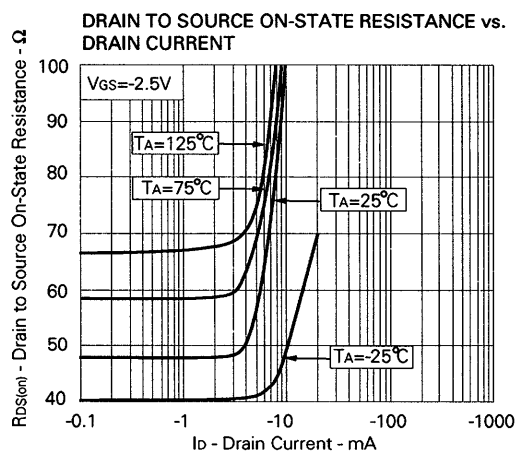
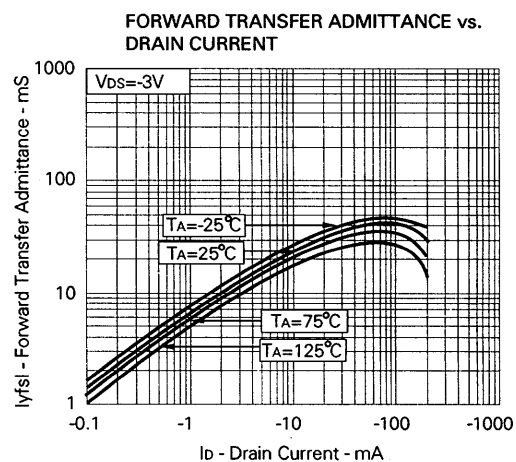
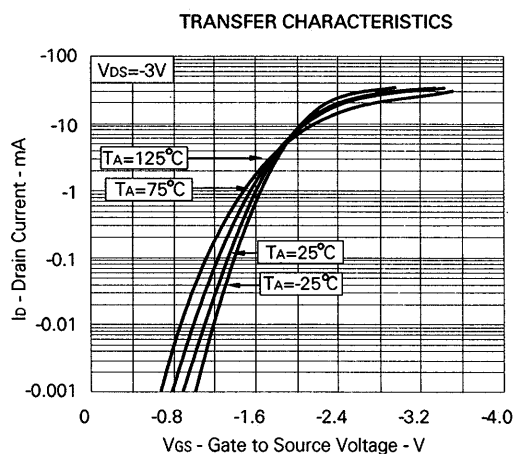
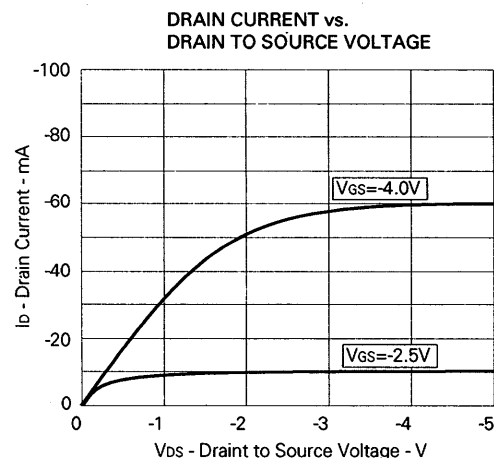
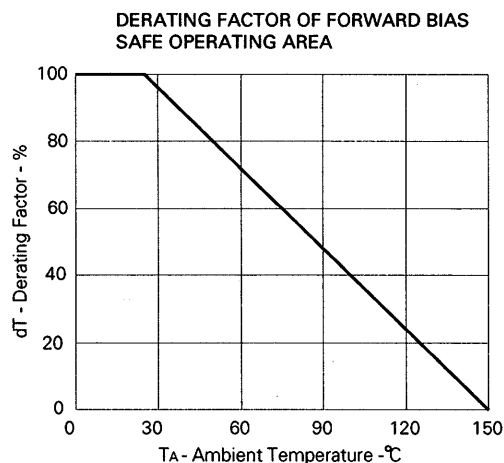
(Diode in the figure is the parasitic diode.)

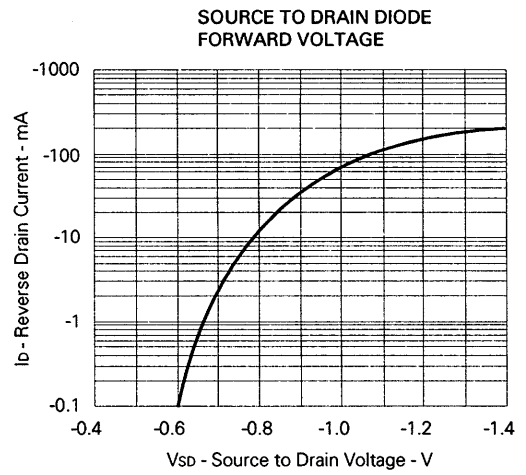
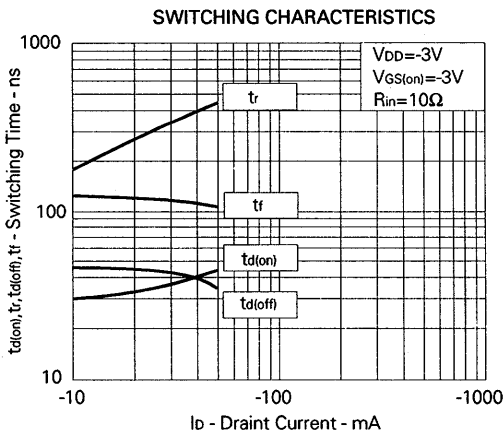
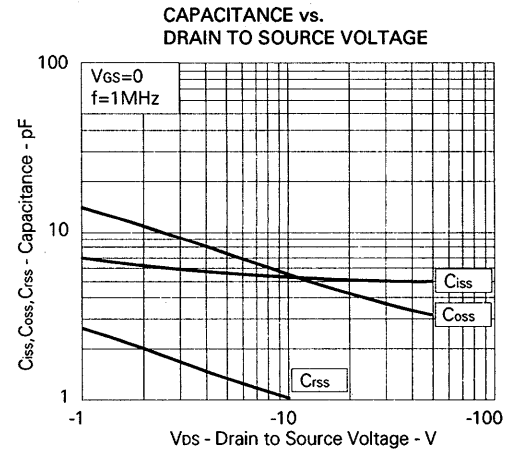
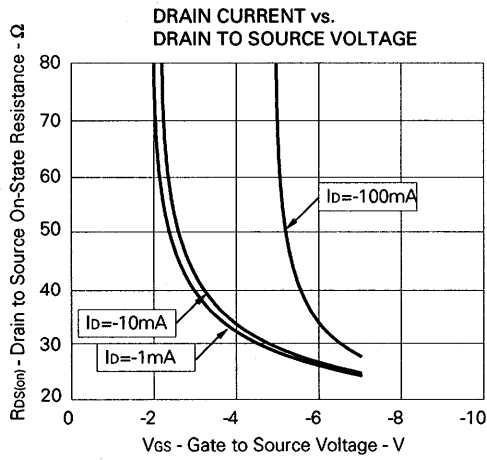
The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = +25 °C)

| CHARACTERISTIC                      | SYMBOL               | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS                                                                                                                    |
|-------------------------------------|----------------------|------|------|------|------|------------------------------------------------------------------------------------------------------------------------------------|
| Drain Cut-off Current               | I <sub>DSS</sub>     |      |      | -1.0 | μA   | V <sub>DS</sub> = -50 V, V <sub>GS</sub> = 0                                                                                       |
| Gate Leakage Current                | I <sub>GSS</sub>     |      |      | ±3.0 | μA   | V <sub>GS</sub> = ±7.0 V, V <sub>DS</sub> = 0                                                                                      |
| Gate Cut-off Voltage                | V <sub>GS(off)</sub> | -0.7 | -0.9 | -1.3 | V    | V <sub>DS</sub> = -3.0 V, I <sub>D</sub> = -1.0 μA                                                                                 |
| Forward Transfer Admittance         | y <sub>fs</sub>      | 12   |      |      | mS   | V <sub>DS</sub> = -3.0 V, I <sub>D</sub> = -10 mA                                                                                  |
| Drain to Source On-State Resistance | R <sub>DS(on)1</sub> |      | 46   | 100  | Ω    | V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -3 mA                                                                                   |
| Drain to Source On-State Resistance | R <sub>DS(on)2</sub> |      | 31   | 50   | Ω    | V <sub>GS</sub> = -4.0 V, I <sub>D</sub> = -10 mA                                                                                  |
| Input Capacitance                   | C <sub>iss</sub>     |      | 6    |      | pF   | V <sub>DS</sub> = -3.0 V, V <sub>GS</sub> = 0<br>f = 1.0 MHz                                                                       |
| Output Capacitance                  | C <sub>oss</sub>     |      | 9    |      | pF   |                                                                                                                                    |
| Reverse Transfer Capacitance        | C <sub>rss</sub>     |      | 1.6  |      | pF   |                                                                                                                                    |
| Turn-On Delay Time                  | t <sub>d(on)</sub>   |      | 32   |      | ns   | V <sub>DD</sub> = -3.0 V, I <sub>D</sub> = -20 mA<br>V <sub>GS(on)</sub> = -3.0 V, R <sub>G</sub> = 10 Ω<br>R <sub>L</sub> = 200 Ω |
| Rise Time                           | t <sub>r</sub>       |      | 270  |      | ns   |                                                                                                                                    |
| Turn-Off Delay Time                 | t <sub>d(off)</sub>  |      | 45   |      | ns   |                                                                                                                                    |
| Fall Time                           | t <sub>f</sub>       |      | 130  |      | ns   |                                                                                                                                    |

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )





**REFERENCE**

| Document Name                                               | Document No.    |
|-------------------------------------------------------------|-----------------|
| NEC semiconductor device reliability/quality control system | TEI-1202        |
| Quality grade on NEC semiconductor devices                  | IEI-1209        |
| Semiconductor device mounting technology manual             | C10535EJ7V0IF00 |
| Guide to quality assurance for semiconductor devices        | MEI-1202        |
| Semiconductor selection guide                               | X10679EJAV0SG00 |

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Anti-radioactive design is not implemented in this product.