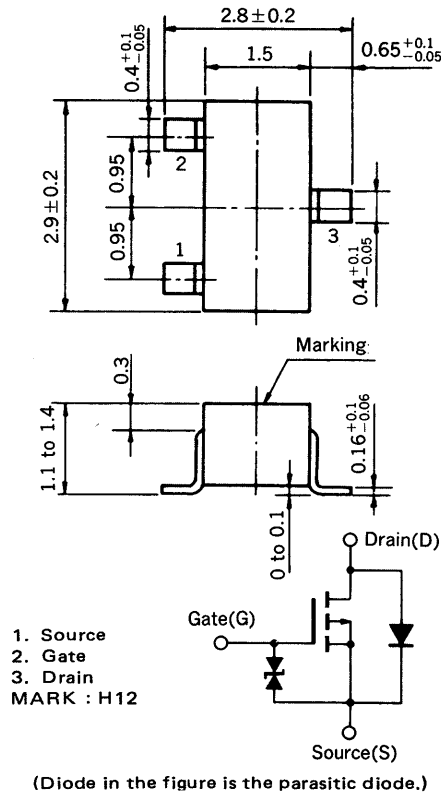


# MOS FIELD EFFECT TRANSISTOR

## 2SJ185

### P-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

#### OUTLINE DIMENSIONS (Unit : mm)



The 2SJ185 is a P-channel vertical type MOS FET which can be driven by 2.5 V power supply.

As the MOS FET is driven by low voltage and does not require consideration of driving current, it is suitable for appliances including VTR cameras and headphone stereos which need power saving.

#### FEATURES

- Directly driven by ICs having a 3 V power supply.
- Not necessary to consider driving current because of its high input impedance.
- Possible to reduce the number of parts by omitting the bias resistor.
- Complementary to 2SK1399

#### QUALITY GRADE

Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

#### ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

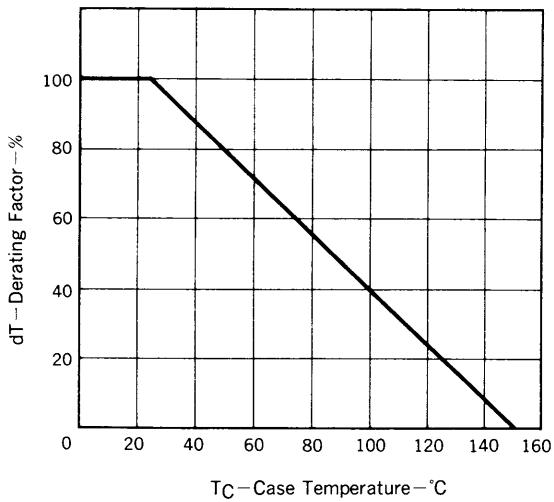
| CHARACTERISTIC          | SYMBOL              | RATINGS     | UNIT             | TEST CONDITIONS                                   |
|-------------------------|---------------------|-------------|------------------|---|
| Drain to Source Voltage | $V_{DSS}$           | -50         | V                | $V_{GS} = 0$                                      |
| Gate to Source Voltage  | $V_{GSS}$           | $\pm 7.0$   | V                | $V_{DS} = 0$                                      |
| Drain Current           | $I_D(\text{DC})$    | $\pm 100$   | mA               |   |
| Drain Current           | $I_D(\text{pulse})$ | $\pm 200$   | mA               | $PW \leq 10 \text{ ms}$ , Duty Cycle $\leq 50 \%$ |
| Total Power Dissipation | $P_T$               | 200         | mW               |   |
| Operating Temperature   | $T_{opt}$           | -55 to +80  | $^\circ\text{C}$ |   |
| Storage Temperature     | $T_{stg}$           | -55 to +150 | $^\circ\text{C}$ |   |

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

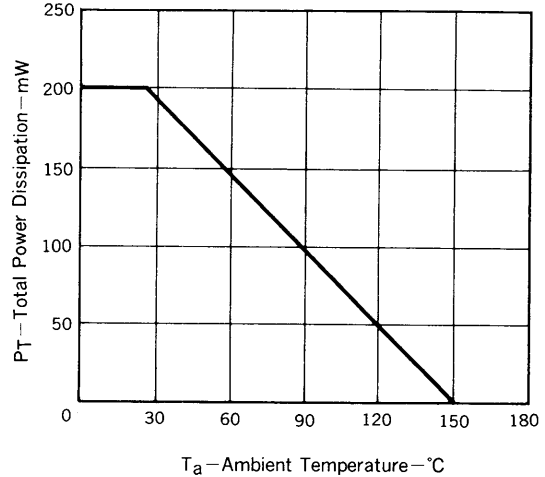
| CHARACTERISTIC                      | SYMBOL               | MIN. | TYP. | MAX. | UNIT | CONDITIONS   |
|-------------------------------------|----------------------|------|------|------|------|--|
| Drain Cut-off Current               | I <sub>DSS</sub>     |      |      | -10  | μA   | V <sub>DS</sub> = -50 V, V <sub>GS</sub> = 0   |
| Gate Leakage Current                | I <sub>GSS</sub>     |      |      | ±5   | μA   | V <sub>GS</sub> = ±7.0 V, V <sub>DS</sub> = 0  |
| Gate Cut-off Voltage                | V <sub>GS(off)</sub> | -1.2 | -1.6 | -2.0 | V    | V <sub>DS</sub> = -3 V, I <sub>D</sub> = -1 μA   |
| Forward Transfer Admittance         | y <sub>fs</sub>      | * 20 | 42   |      | mS   | V <sub>DS</sub> = -3 V, I <sub>D</sub> = -10 mA  |
| Drain to Source On-State Resistance | R <sub>DS(on)1</sub> |      | 25   | 40   | Ω    | V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -1 mA   |
| Drain to Source On-State Resistance | R <sub>DS(on)2</sub> |      | 13   | 20   | Ω    | V <sub>GS</sub> = -4.0 V, I <sub>D</sub> = -10 mA  |
| Input Capacitance                   | C <sub>iss</sub>     |      | 22   |      | pF   | V <sub>DS</sub> = -3 V, V <sub>GS</sub> = 0, f = 1 MHz   |
| Output Capacitance                  | C <sub>oss</sub>     |      | 12   |      | pF   |  |
| Feedback Capacitance                | C <sub>rss</sub>     |      | 4    |      | pF   |  |
| Turn-On Delay Time                  | t <sub>d(on)</sub>   |      | 80   |      | ns   | V <sub>GS(on)</sub> = -3 V, R <sub>G</sub> = 10 Ω, V <sub>DD</sub> = -3 V, I <sub>D</sub> = -20 mA, R <sub>L</sub> = 150 Ω |
| Rise Time                           | t <sub>r</sub>       |      | 230  |      | ns   |  |
| Turn-Off Delay Time                 | t <sub>d(off)</sub>  |      | 40   |      | ns   |  |
| Fall Time                           | t <sub>f</sub>       |      | 70   |      | ns   |  |

TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

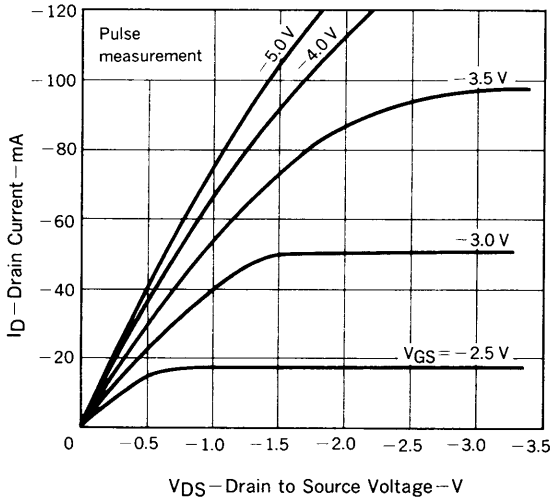
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



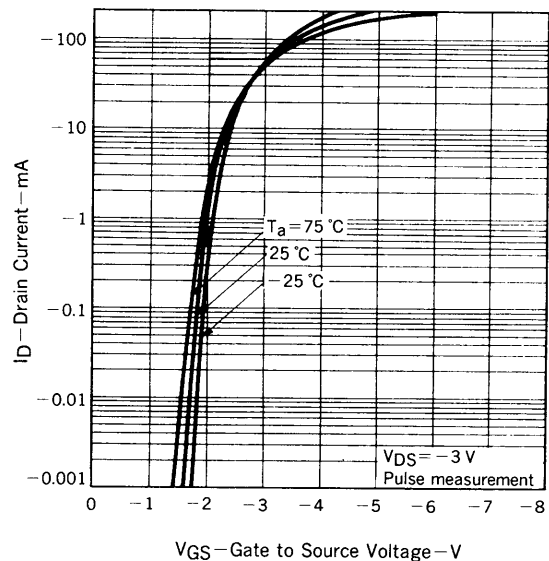
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

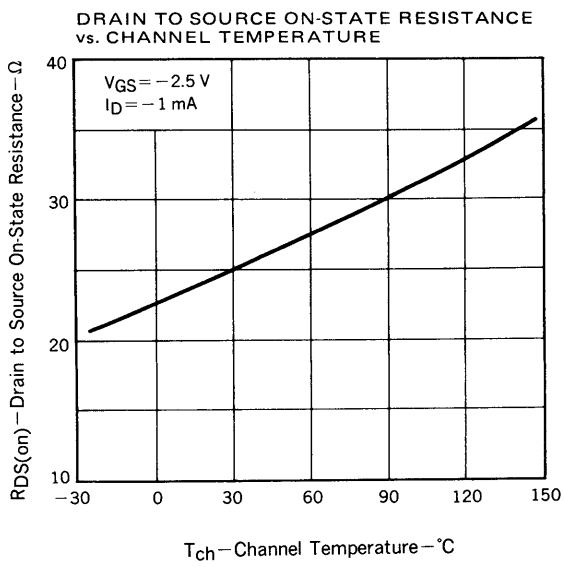
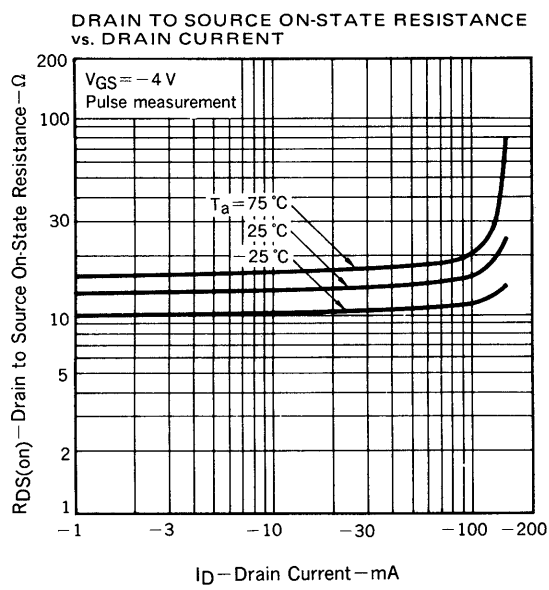
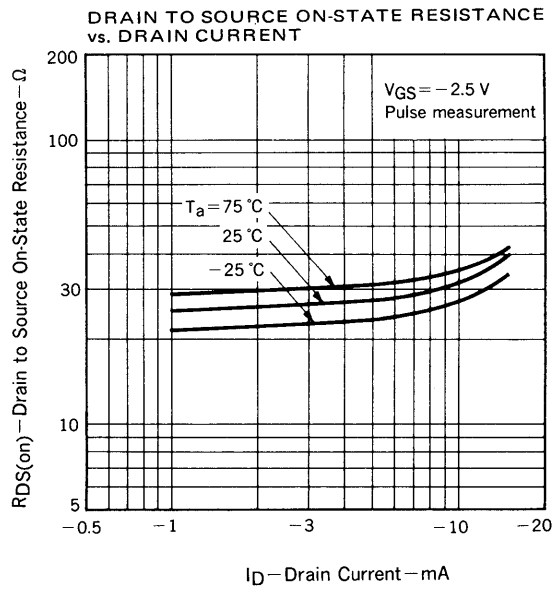
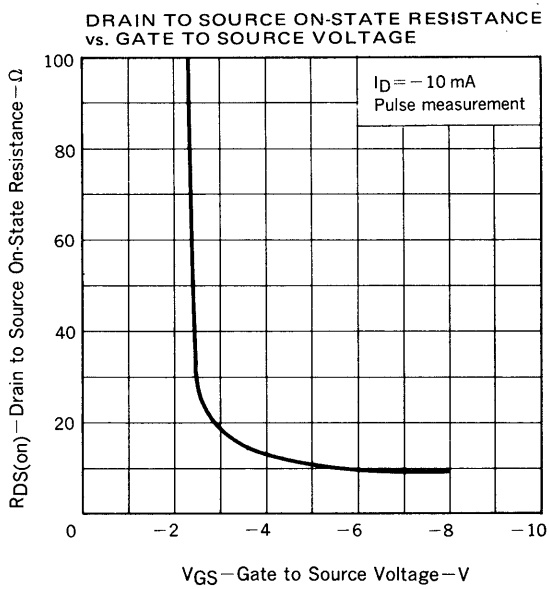
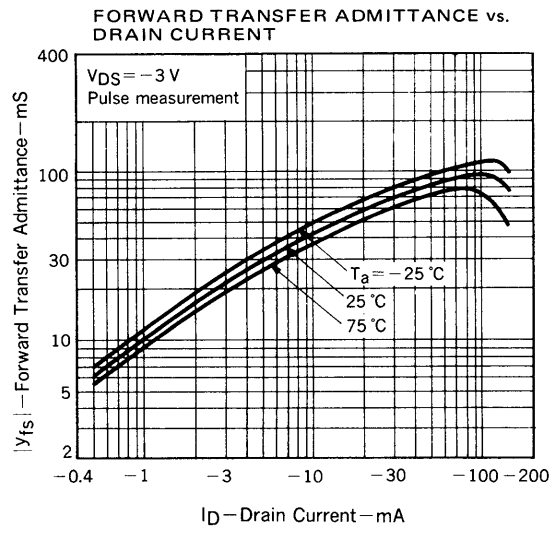
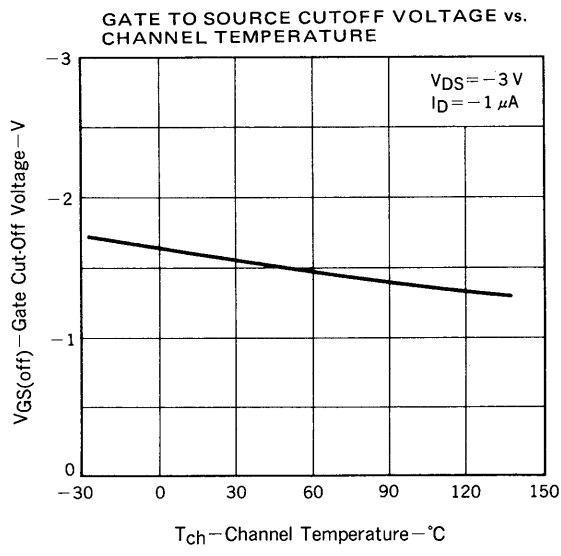


DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE

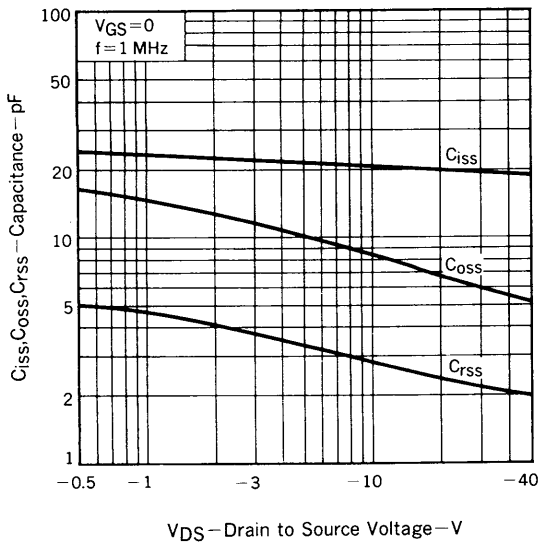


TRANSFER CHARACTERISTICS

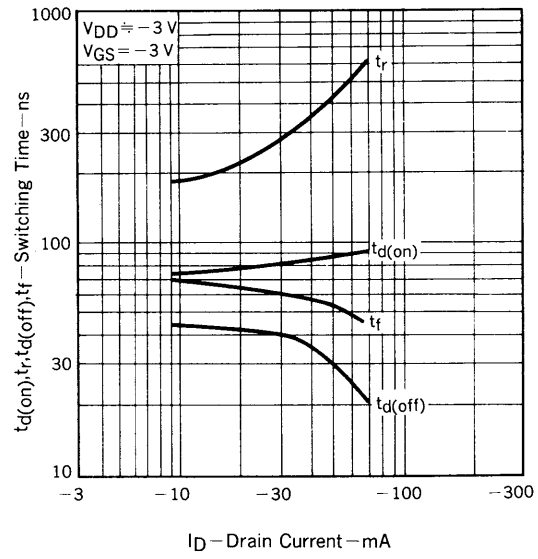




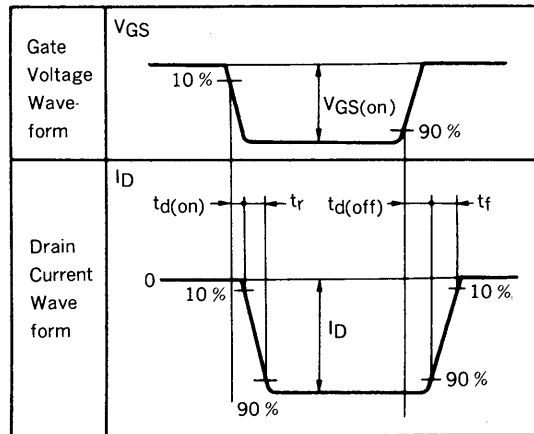
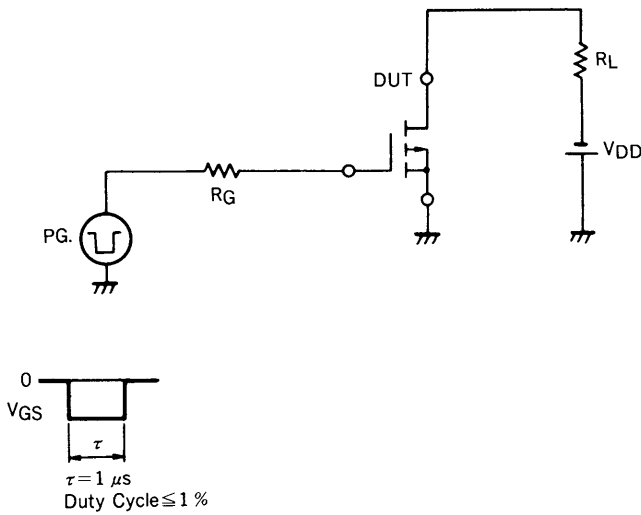
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS



**RECOMMENDED SOLDERING CONDITIONS**

Mounting of this product by soldering should be done under the following conditions.  
Please consult our representatives about soldering methods and conditions other than these.

**SURFACE MOUNT TYPE**

For details of the recommended soldering conditions, see the information document.  
"Device Mounting Manual for Surface Mounting (IEI-616)."

| Soldering Method      | Soldering Conditions   | Symbol for Recommended Conditions |
|-----------------------|--|-----------------------------------|
| Infrared Reflow       | Package peak temp.: 210 °C<br>Soldering time: within 30 sec (above 210 °C)<br>Soldering times: 1, Days limitation: none* | IR30-00                           |
| Vapor Phase Soldering | Package peak temp.: 215 °C<br>Soldering time: within 40 sec (above 200 °C)<br>Soldering times: 1, Days limitation: none* | VP15-00                           |
| Wave Soldering        | Soldering bath temp.: below 260 °C<br>Soldering time: within 10 sec<br>Soldering times: 1, Days limitation: none*        | WS60-00                           |

\*: Stored days under storage conditions at 25 °C and below 65 % R.H. after the dry-pack has been opened.

**Note 1** Combination of soldering methods should be avoided.

[MEMO]

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Application examples recommended by NEC Corporation

Standard: Data processing and office equipment, Communication equipment (terminal, mobile). Test and Measurement equipment, Audio and Video equipment, Other consumer products, etc.

Special: Automotive and Transportation equipment, Communication equipment (trunk line), Train and Traffic control devices, industrial robots, Burning control systems, antidisaster systems, anticrime systems etc.