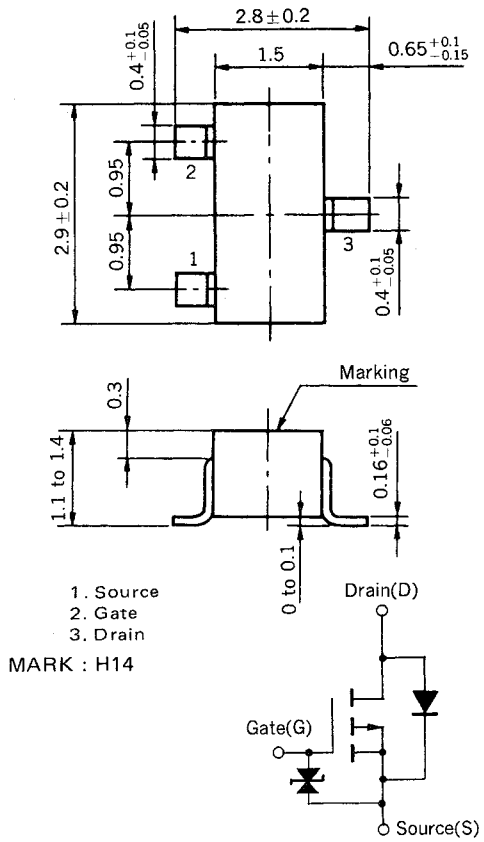
NEC

# MOS FIELD EFFECT TRANSISTOR
# 2SJ203

## P-CHANNEL MOS FET
## FOR SWITCHING

**PACKAGE DIMENSIONS (Unit : mm)**




(Diode in the figure is the parasitic diode.)

The 2SJ203 is a P-channel vertical type MOS FET which can be driven by a 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 VCR, cameras and headphone stereos which require power saving.

### FEATURES

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

### 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 °C)

| CHARACTERISTIC | SYMBOL | CONDITIONS | RATINGS | UNIT |
|---|---|---|---|---|
| Drain to Source Voltage | $V_{DSS}$ | $V_{GS}$ = 0 | −16 | V |
| Gate to Source Voltage | $V_{GSS}$ | $V_{DS}$ = 0 | ∓7 | V |
| Drain Current | $I_{D(DC)}$ | | ∓200 | mA |
| Drain Current | $I_{D(pulse)}$ | PW ≦ 10 ms, Duty Cycle ≦ 50 % | ∓400 | mA |
| Total Power Dissipation | $P_T$ | | 200 | mW |
| Channel Temperature | $T_{ch}$ | | 150 | °C |
| Operating Temperature | $T_{opt}$ | | −55 to +80 | °C |
| Storage Temperature | $T_{stg}$ | | −55 to +150 | °C |

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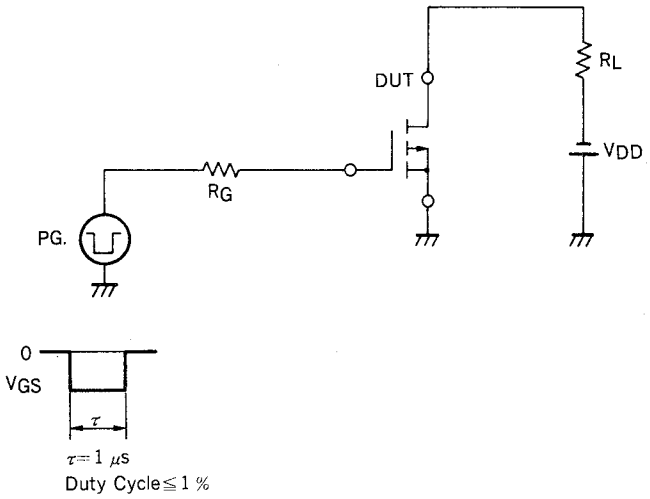
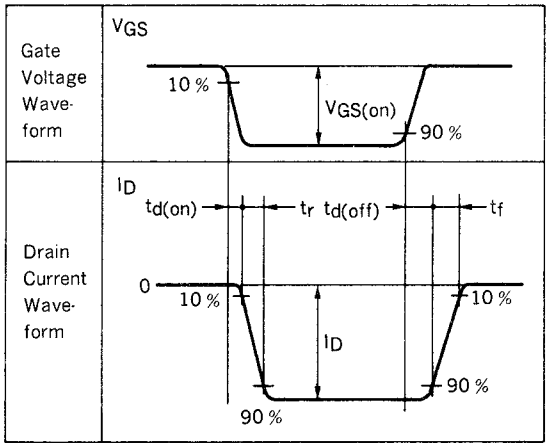
## ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C)

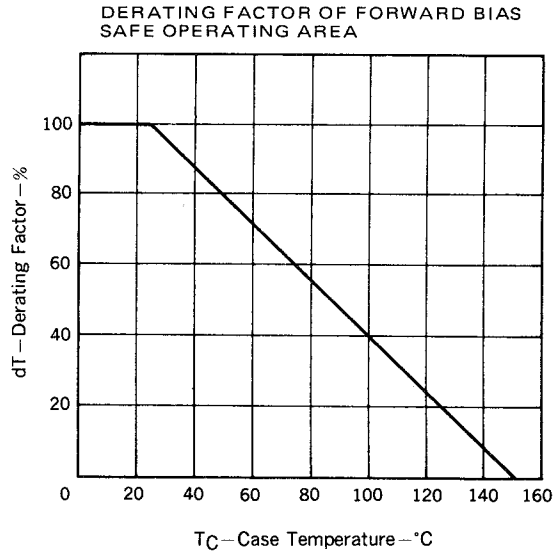
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|---|---|---|---|---|---|---|
| Drain Cut-off Current | $I_{DSS}$ | | | −1.0 | μA | $V_{DS}$ = −16 V, $V_{GS}$ = 0 |
| Gate Leakage Current | $I_{GSS}$ | | | ∓10 | μA | $V_{GS}$ = +3.0 V, $V_{DS}$ = 0 |
| Gate Cut-off Voltage | $V_{GS(off)}$ | −1.2 | −1.6 | −2.2 | V | $V_{DS}$ = −3.0 V, $I_D$ = 1 μA |
| Forward Transfer Admittance | $\|y_{fs}\|$ | 20 | 48 | | mS | $V_{DS}$ = −3.0 V, $I_D$ = −10 mA |
| Drain to Source On-State Resistance | $R_{DS(on)1}$ | | 15 | 23 | Ω | $V_{GS}$ = −2.5 V, $I_D$ = −1 mA |
| Drain to Source On-State Resistance | $R_{DS(on)2}$ | | 7 | 10 | Ω | $V_{GS}$ = −4.0 V, $I_D$ = −1 mA |
| Input Capacitance | $C_{iss}$ | | 28 | | pF | $V_{DS}$ = −3.0 V, $V_{GS}$ = 0<br>f = 1 MHz |
| Output Capacitance | $C_{oss}$ | | 32 | | pF | |
| Feedback Capacitance | $C_{rss}$ | | 6 | | pF | |
| Turn-On Delay Time | $t_{d(on)}$ | | 180 | | ns | $V_{GS(on)}$ = −3.0 V, $R_G$ = 10 Ω, $V_{DD}$ = −3.0 V<br>$I_D$ = −10 mA, $R_L$ = 300 Ω |
| Rise Time | $t_r$ | | 420 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 100 | | ns | |
| Fall Time | $t_f$ | | 200 | | ns | |

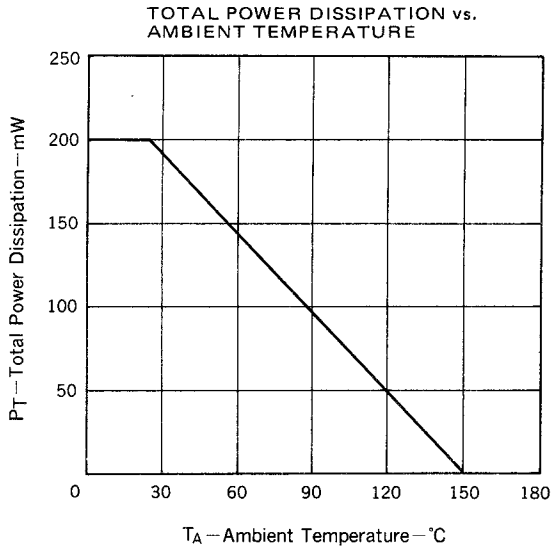
## SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS



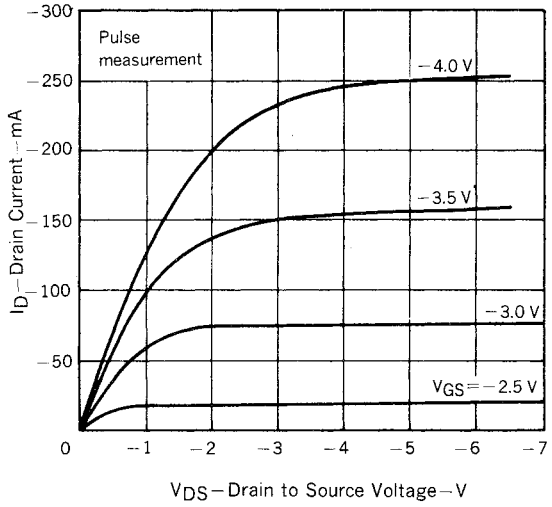




## TYPICAL CHARACTERISTICS ($T_A$ = 25 °C)

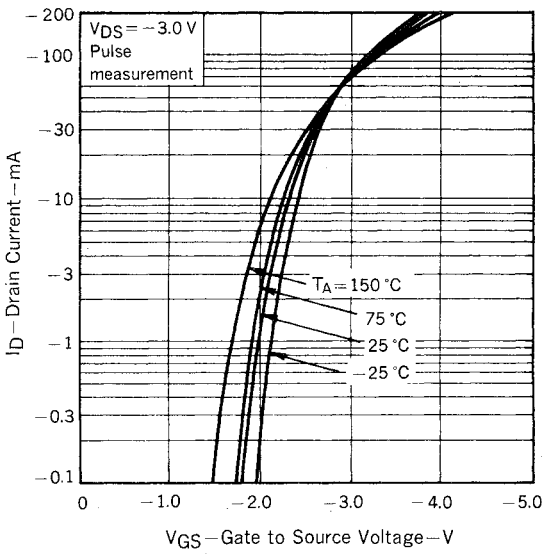


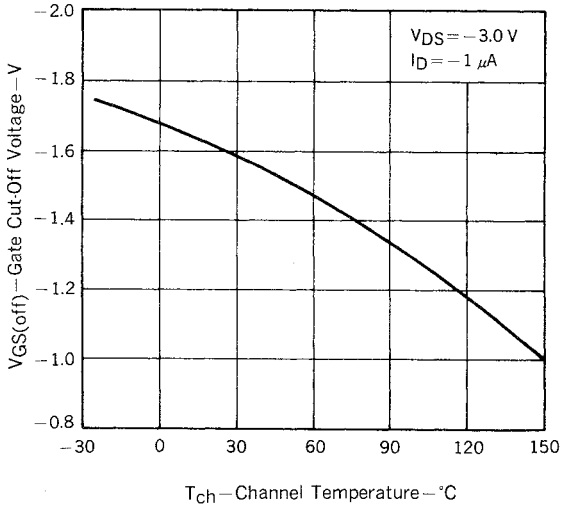
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



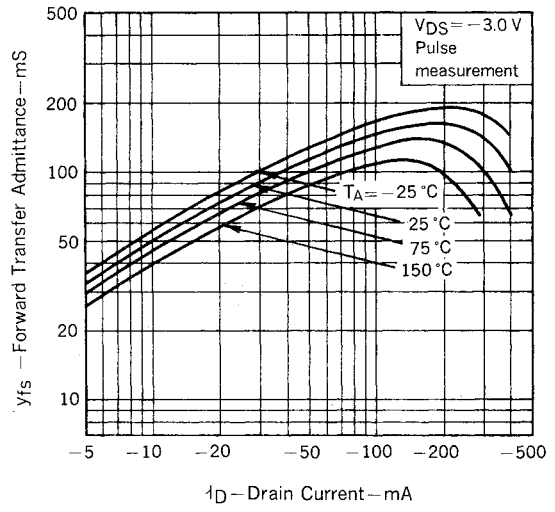

TRANSFER CHARACTERISTICS



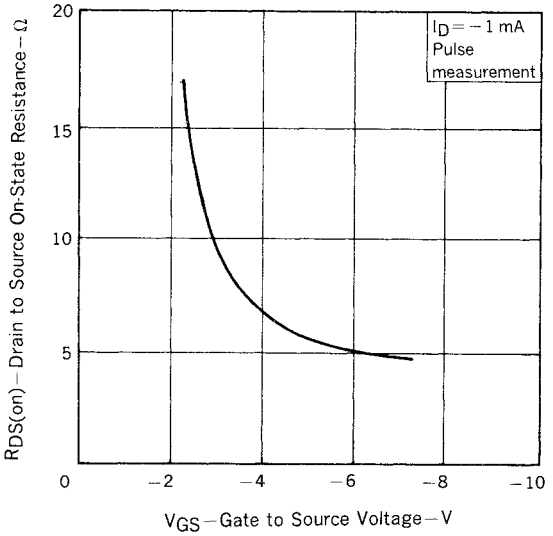

GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



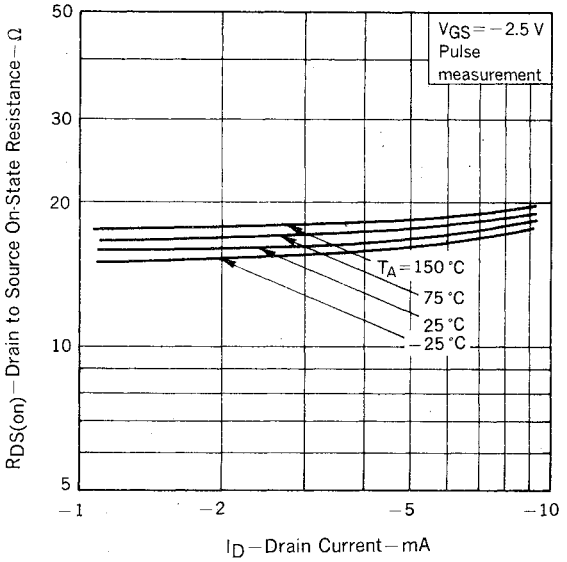

FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



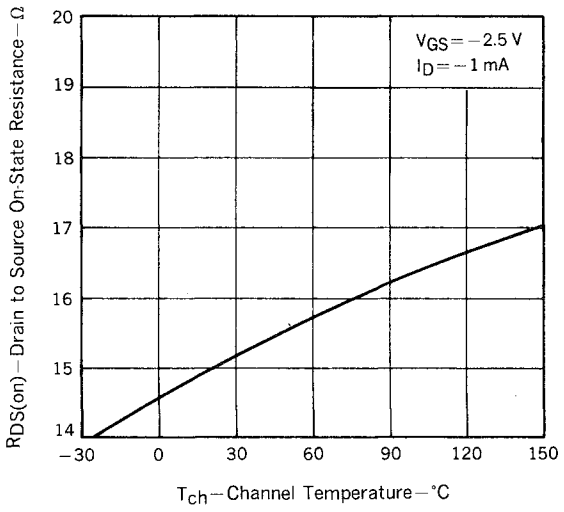

DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



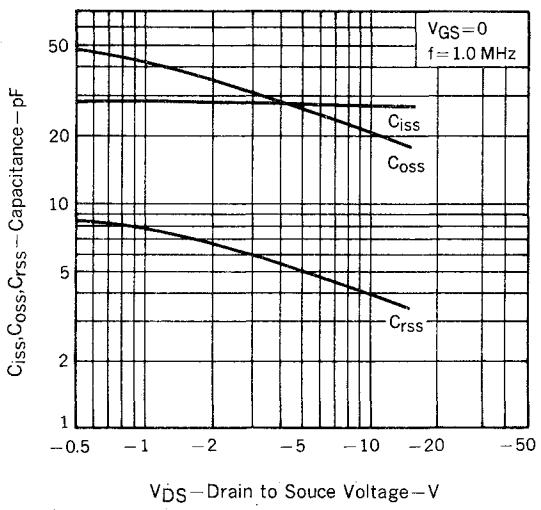

DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



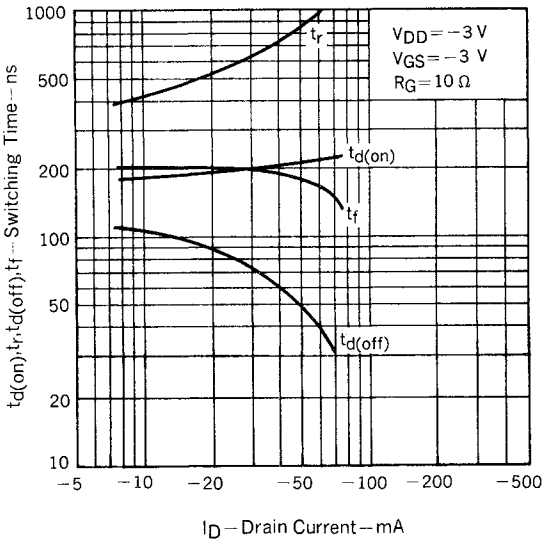
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



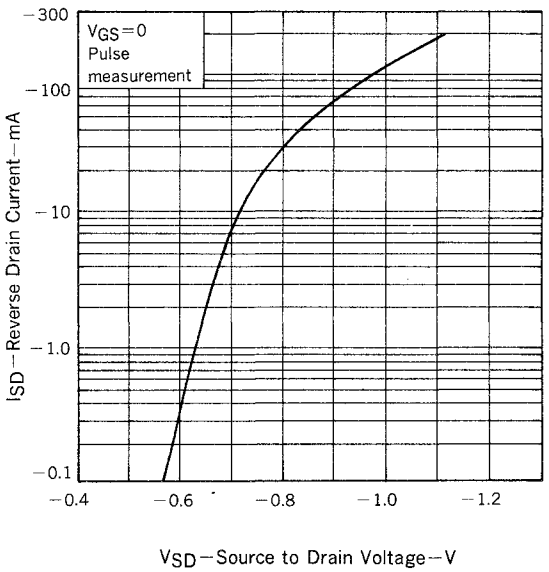

CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE




SWITCHING CHARACTERISTICS




SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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