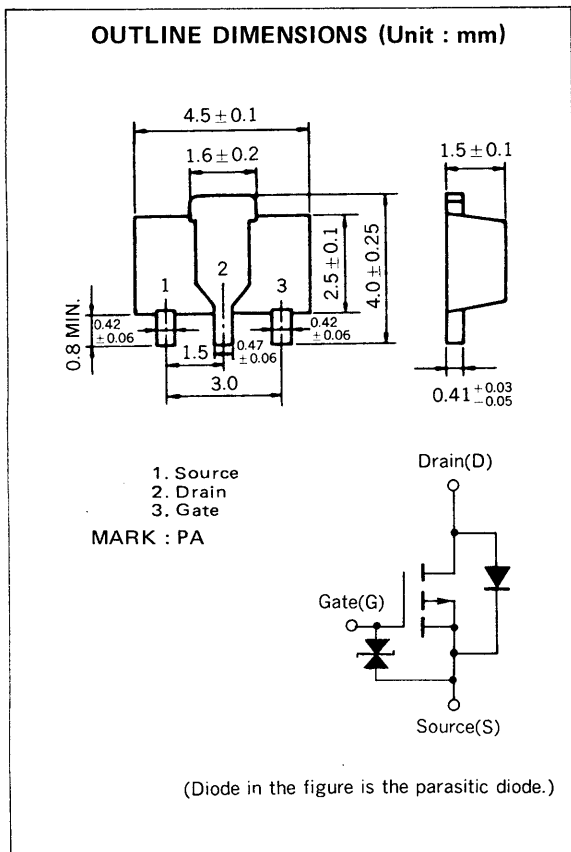


P-CHANNEL MOS FET
FOR HIGH-SPEED SWITCHING



The 2SJ179, P-channel vertical type MOS FET, is a switching device which can be driven directly by the output of ICs having a 5 V power source.

As the MOS FET has low on-state resistance and excellent switching characteristics, it is suitable for driving actuators such as motors, relays, and solenoids.

FEATURES

- Directly driven by ICs having a 5 V power supply.
- Has low on-state resistance
 $R_{DS(on)} = 1.5 \Omega \text{ MAX. @ } V_{GS} = -4.0 \text{ V, } I_D = -0.5 \text{ A}$
 $R_{DS(on)} = 1.0 \Omega \text{ MAX. @ } V_{GS} = -10 \text{ V, } I_D = -0.5 \text{ A}$
- Bidirectional Zener Diode for protection is incorporated between Gate and Source.
- Inductive loads can be driven without protective circuit thanks to the improved breakdown voltage between Drain and Source.

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.

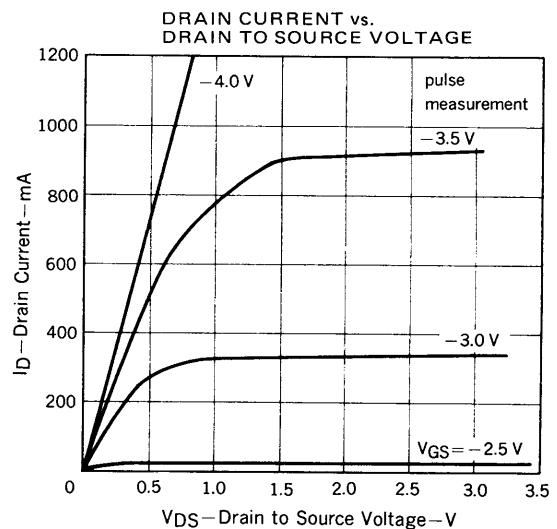
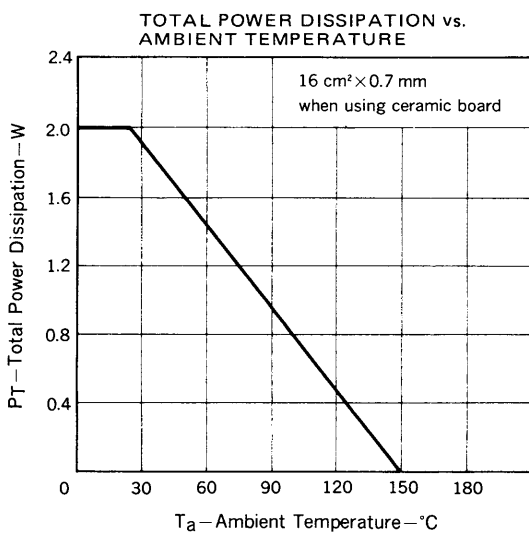
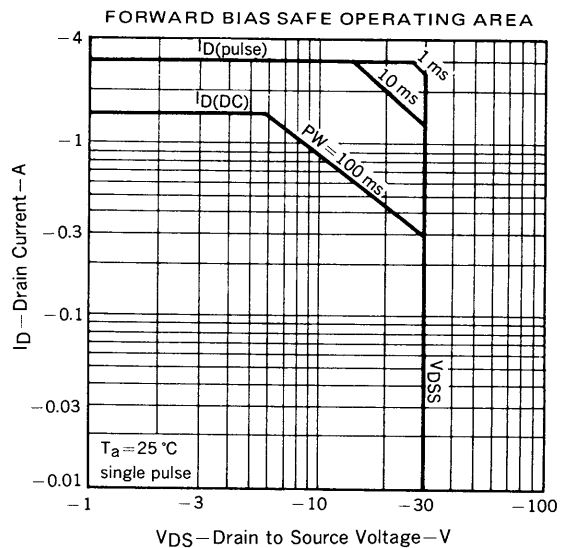
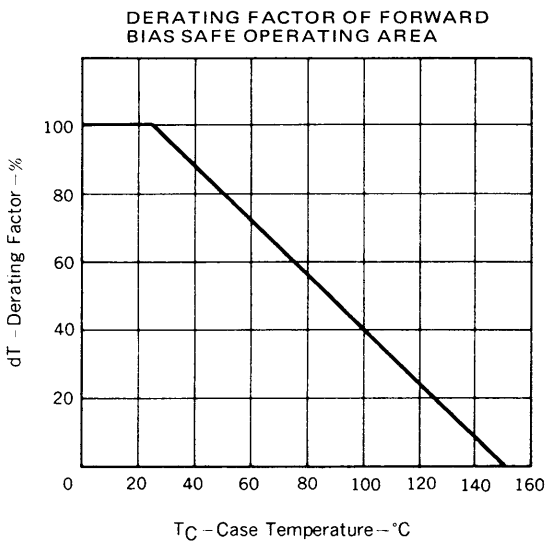
ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

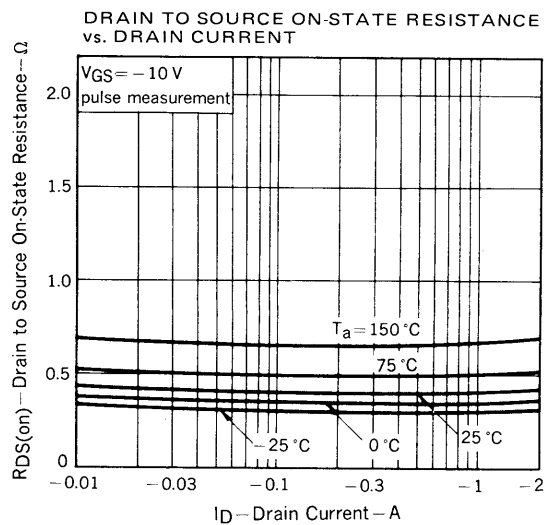
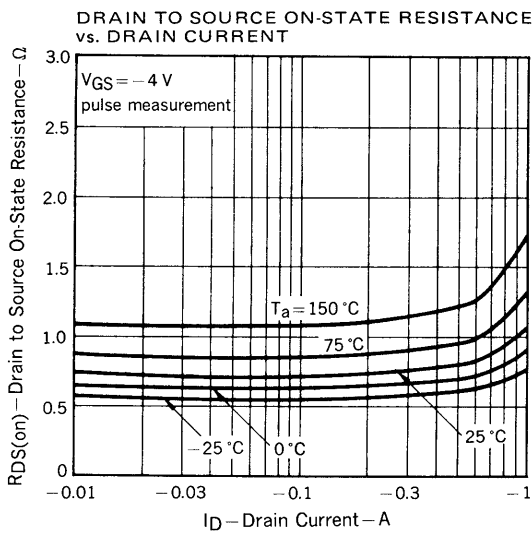
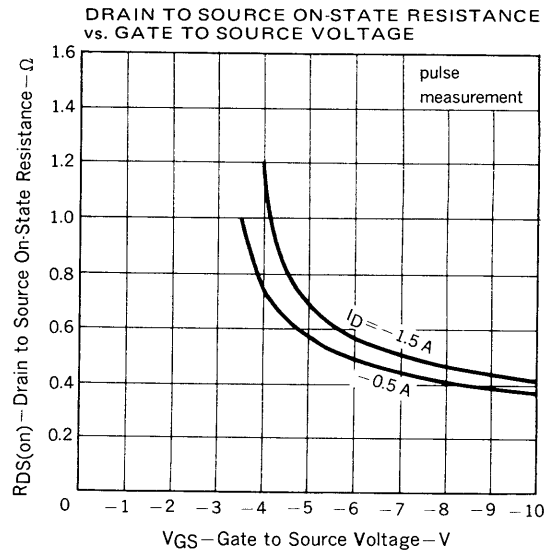
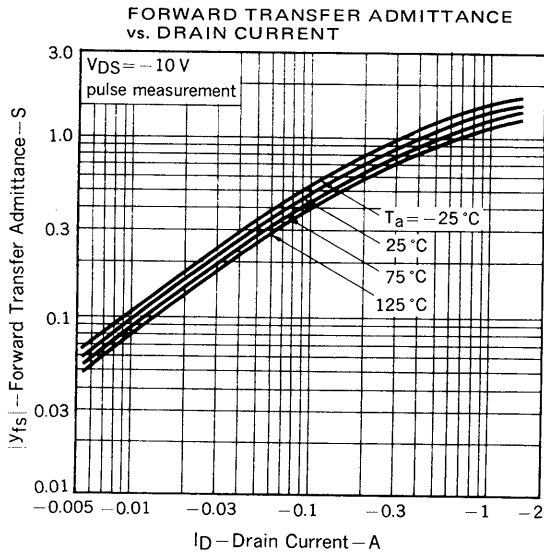
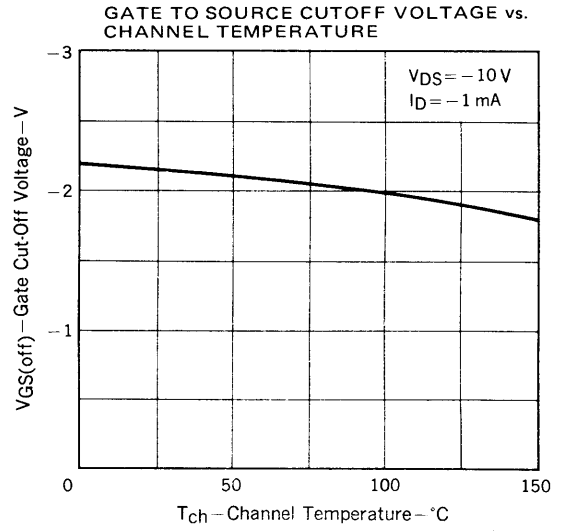
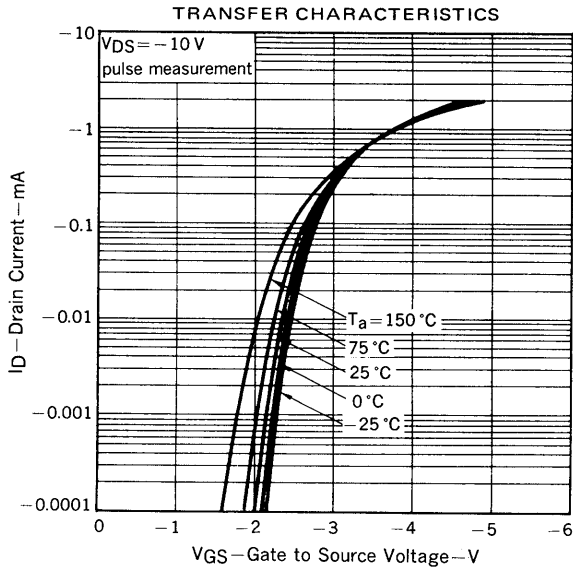
| CHARACTERISTIC | SYMBOL | CONDITIONS | RATINGS | UNIT |
|-------------------------|---------------------|---|-------------|------|
| Drain to Source Voltage | V_{DSS} | $V_{GS} = 0$ | -30 | V |
| Gate to Source Voltage | V_{GSS} | $V_{DS} = 0$ | ±20 | V |
| Drain Current | $I_D(\text{DC})$ | | ±1.5 | A |
| Drain Current | $I_D(\text{pulse})$ | $PW \leq 10 \text{ ms, Duty Cycle} \leq 50 \%$ | ±3.0 | A |
| Total Power Dissipation | P_T | when using ceramic board of $0.7 \text{ mm} \times 16 \text{ cm}^2$ | 2.0 | W |
| Channel Temperature | T_{ch} | | 150 | °C |
| Storage Temperature | T_{stg} | | -55 to +150 | °C |

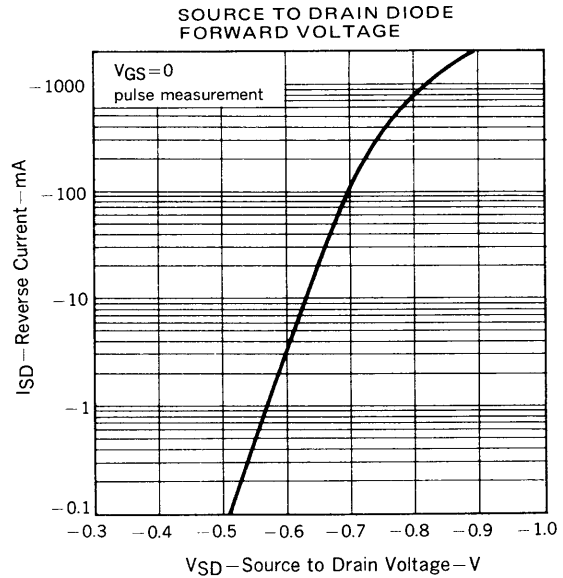
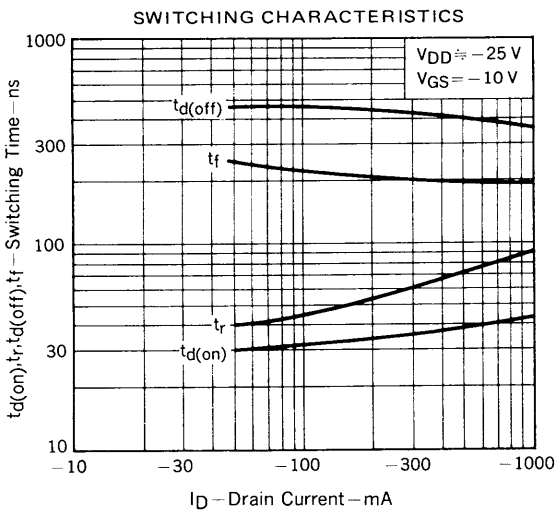
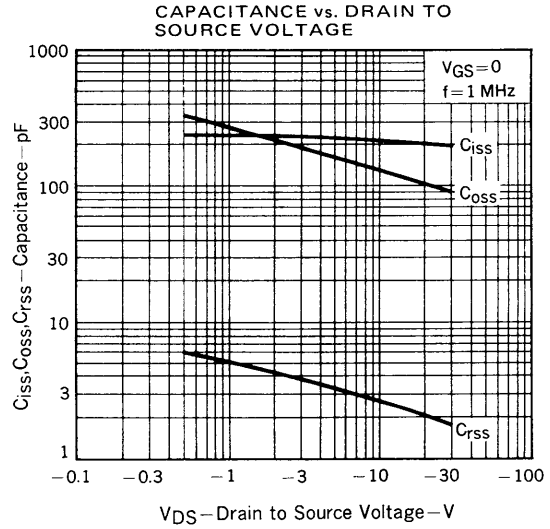
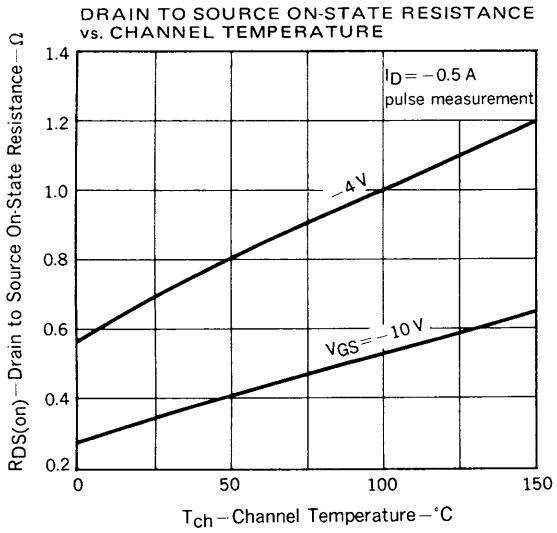
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|-------------------------------------|---------------|------|------|----------|---------------|---|
| Drain Cut-off Current | I_{DSS} | | | -10 | μA | $V_{DS} = -30\text{ V}, V_{GS} = 0$ |
| Gate Leakage Current | I_{GSS} | | | ± 10 | μA | $V_{GS} = \pm 20\text{ V}, V_{DS} = 0$ |
| Gate Cut-off Voltage | $V_{GS(off)}$ | -1.0 | -2.2 | -3.0 | V | $V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$ |
| Forward Transfer Admittance | $ y_{fs} $ | 0.4 | | | S | $V_{DS} = -10\text{ V}, I_D = -0.5\text{ A}$ |
| Drain to Source On-State Resistance | $R_{DS(on)1}$ | | 0.8 | 1.5 | Ω | $V_{GS} = -4.0\text{ V}, I_D = -0.5\text{ A}$ |
| Drain to Source On-State Resistance | $R_{DS(on)2}$ | | 0.4 | 1.0 | Ω | $V_{GS} = -10\text{ V}, I_D = -0.5\text{ A}$ |
| Input Capacitance | C_{iss} | | 210 | | pF | $V_{DS} = -10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$ |
| Output Capacitance | C_{oss} | | 130 | | pF | |
| Feedback Capacitance | C_{rss} | | 3 | | pF | |
| Turn-On Delay Time | $t_{d(on)}$ | | 35 | | ns | $V_{GS(on)} = -10\text{ V}, R_G = 10\ \Omega, V_{DD} = -25\text{ V}, I_D = -0.5\text{ A}, R_L = 50\ \Omega$ |
| Rise Time | t_r | | 70 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 380 | | ns | |
| Fall Time | t_f | | 200 | | ns | |

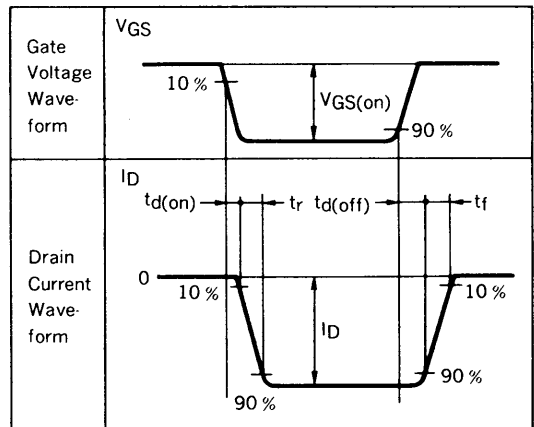
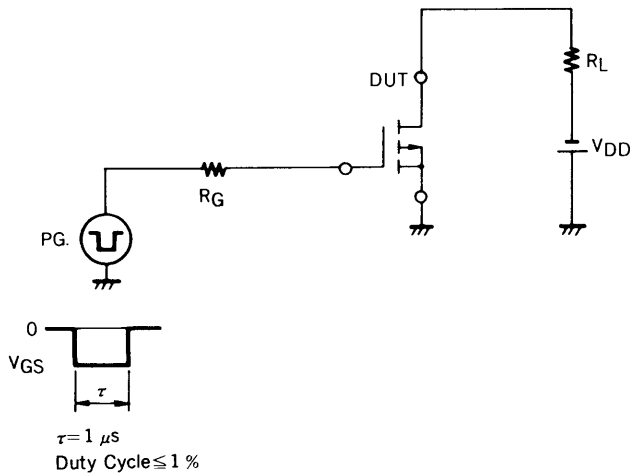
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)







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-1207).”

| Soldering Method | Soldering Conditions | Symbol for Recommended Conditions |
|-----------------------|--|-----------------------------------|
| Infrared Reflow | Package peak temp.: 230 °C Soldering time: within 30 sec (above 210 °C) Soldering times: 1, Days limitation: none* | IR30-00 |
| Vapor Phase Soldering | Package peak temp.: 215 °C Soldering time: within 40 sec (above 200 °C) Soldering times: 1, Days limitation: none* | VP15-00 |
| Wave Soldering | Soldering bath temp.: below 260 °C Soldering time: within 10 sec 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.

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. | IEI-1207 |
| Semiconductor device package manual. | IEI-1213 |
| Guide to quality assurance for semiconductor devices. | MEI-1202 |
| Semiconductor selection guide. | MF-1134 |

[MEMO]

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Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.