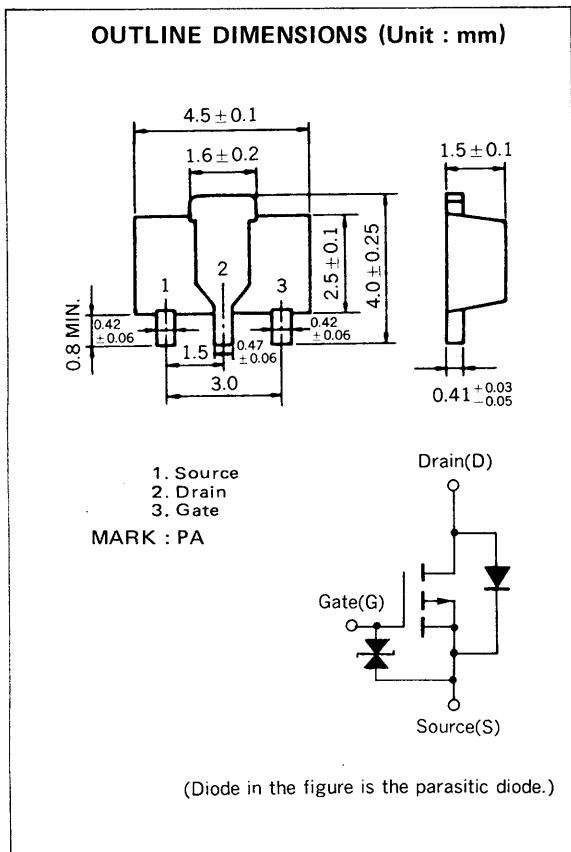


P-CHANNEL MOS FET  
FOR HIGH-SPEED SWITCHING



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.

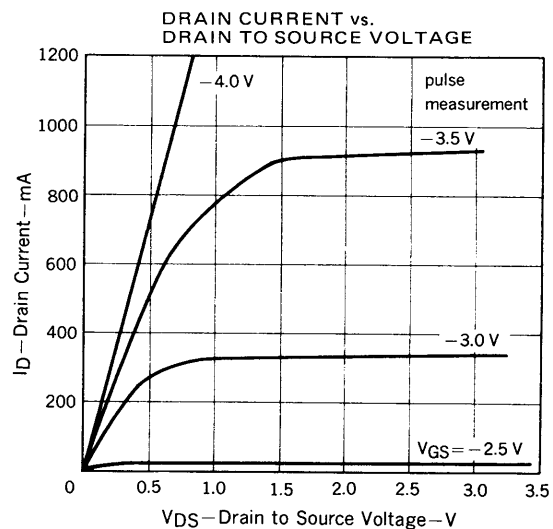
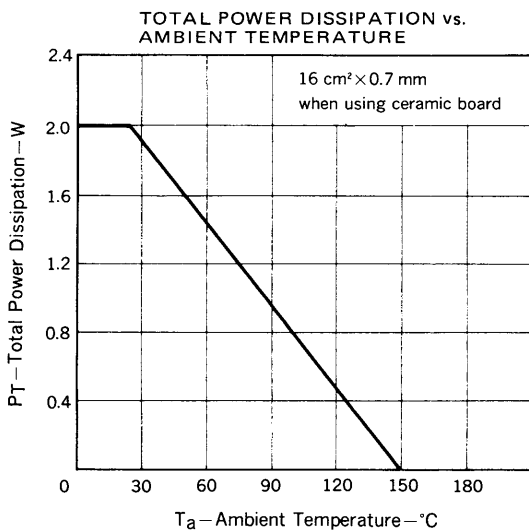
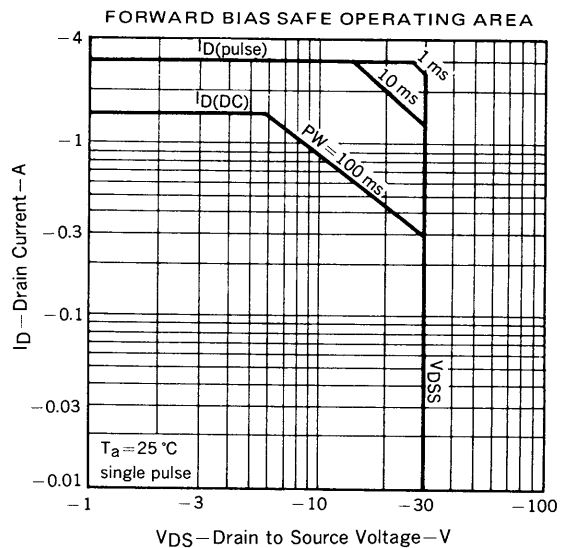
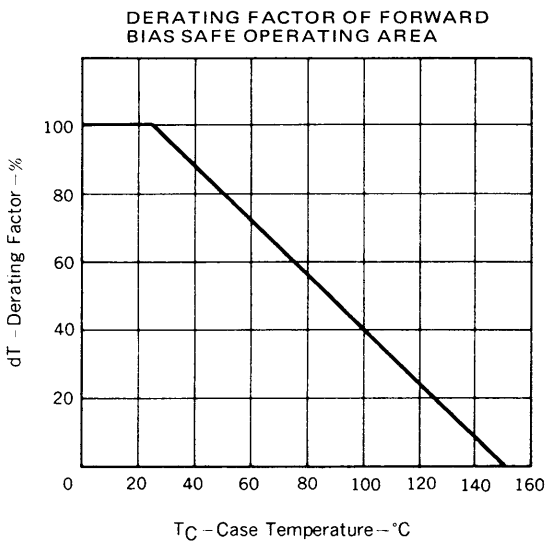
**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25 \text{ }^\circ\text{C}$ )**

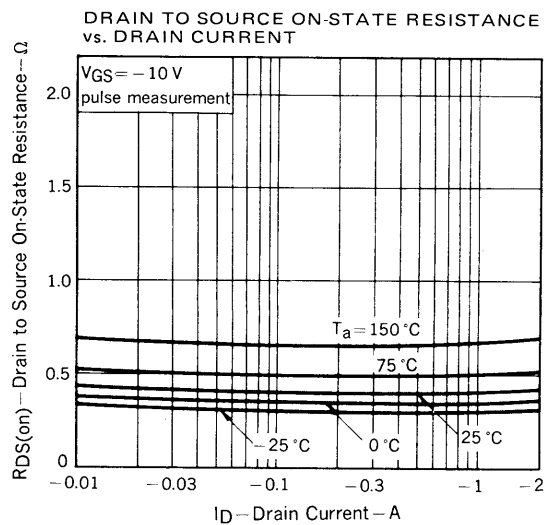
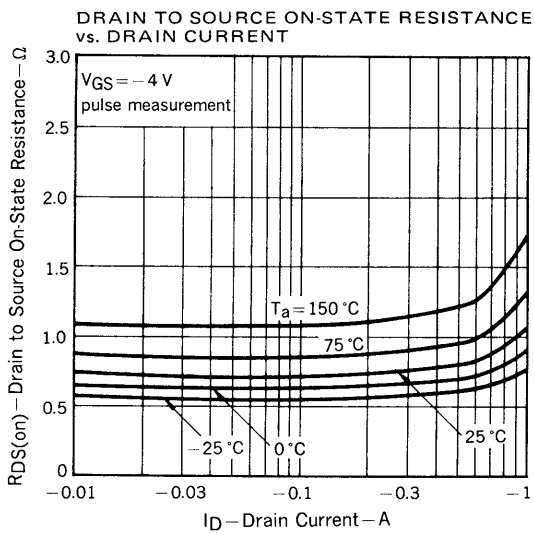
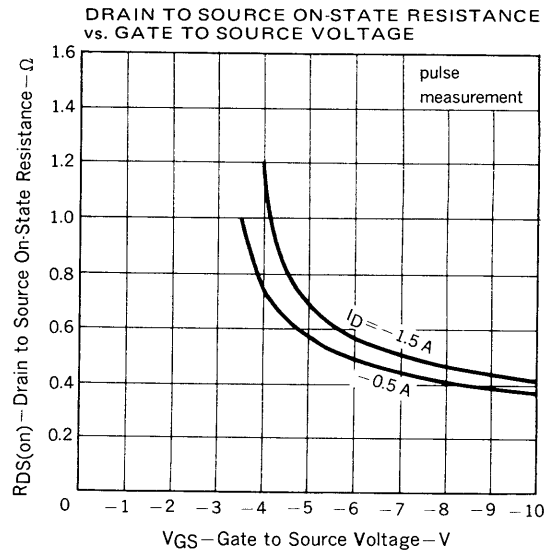
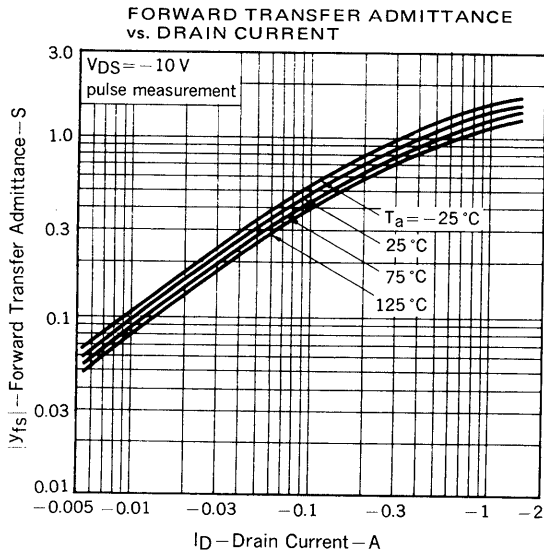
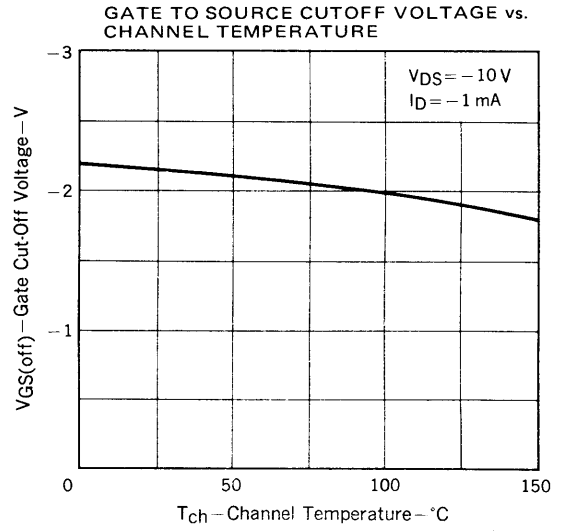
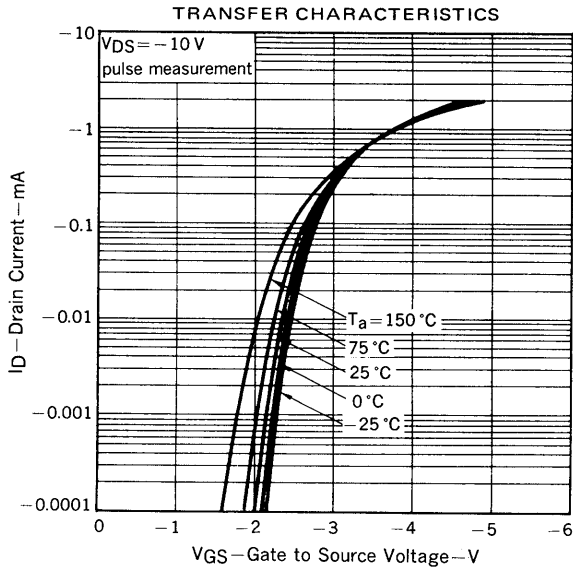
CHARACTERISTIC	SYMBOL	CONDITIONS	RATINGS	UNIT
Drain to Source Voltage	$V_{DSS}$	$V_{GS} = 0$	-30	V
Gate to Source Voltage	$V_{GSS}$	$V_{DS} = 0$	$\pm 20$	V
Drain Current	$I_D(DC)$		$\pm 1.5$	A
Drain Current	$I_D(\text{pulse})$	$PW \leq 10 \text{ ms, Duty Cycle} \leq 50 \%$	$\pm 3.0$	A
Total Power Dissipation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

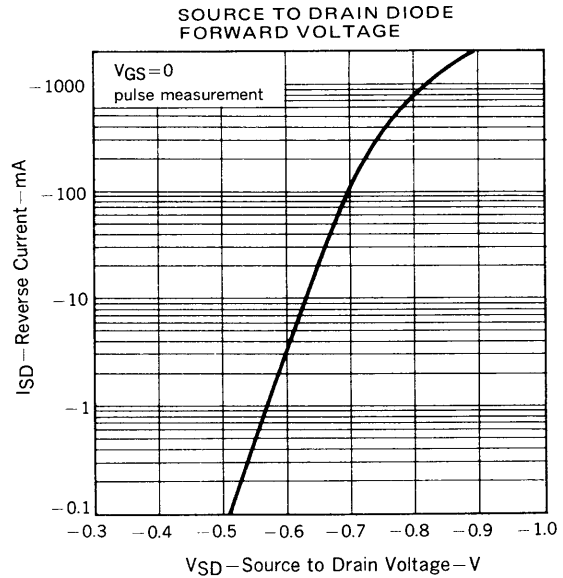
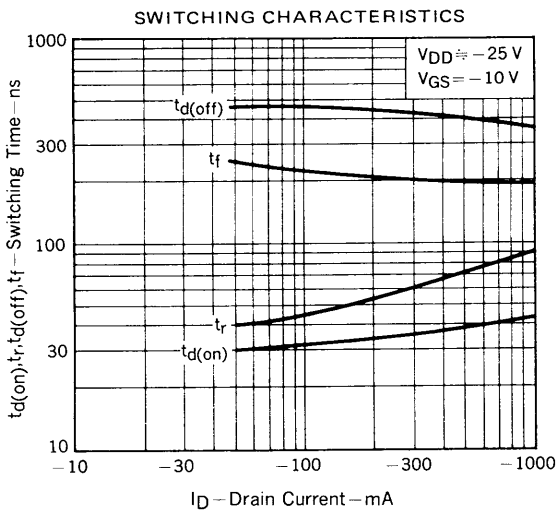
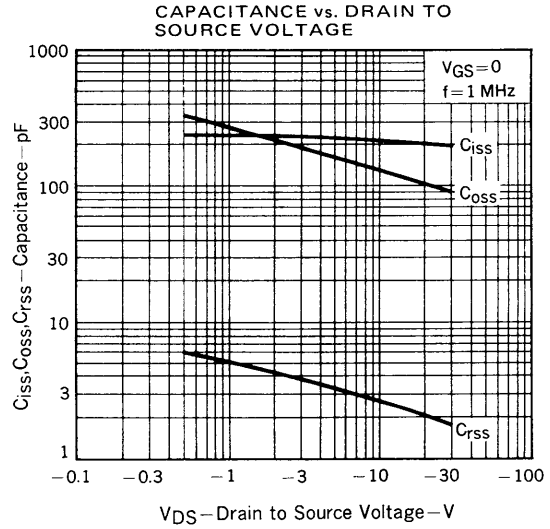
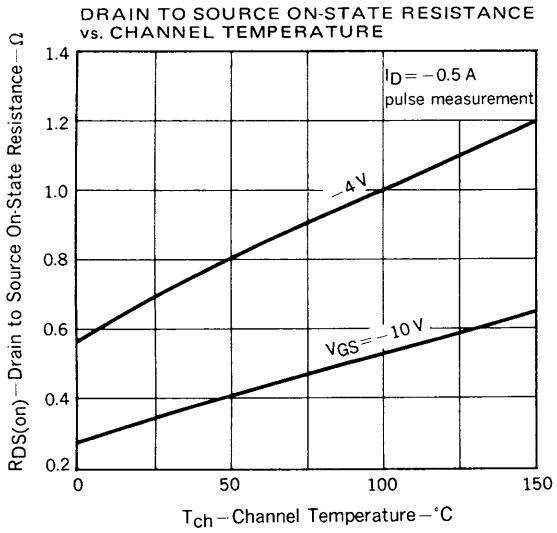
ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Drain Cut-off Current	$I_{DSS}$			-10	$\mu\text{A}$	$V_{DS} = -30\text{ V}, V_{GS} = 0$
Gate Leakage Current	$I_{GSS}$			$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0$
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	$\Omega$	$V_{GS} = -4.0\text{ V}, I_D = -0.5\text{ A}$
Drain to Source On-State Resistance	$R_{DS(on)2}$		0.4	1.0	$\Omega$	$V_{GS} = -10\text{ V}, I_D = -0.5\text{ A}$
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	

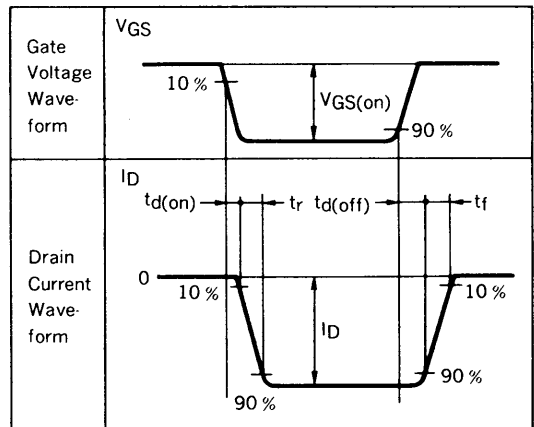
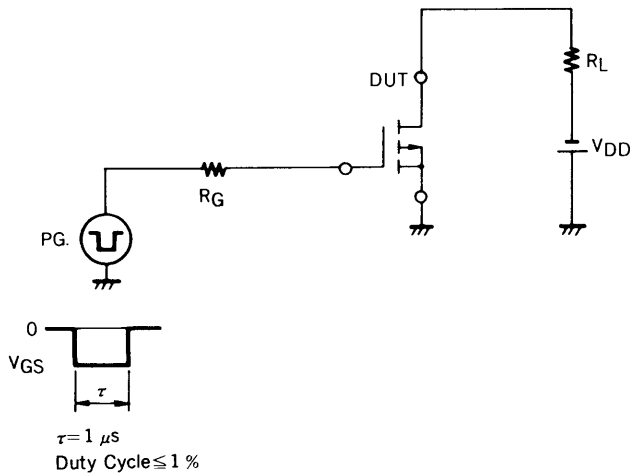
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )







**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

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