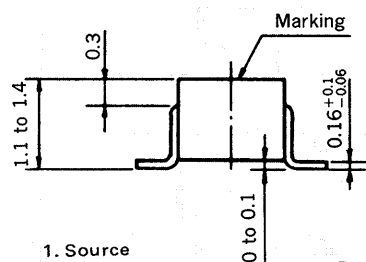
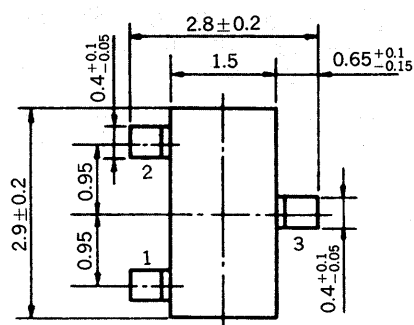


# MOS FIELD EFFECT TRANSISTOR

## 2SK1591

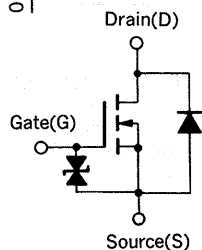
### N-CHANNEL MOS FET FOR SWITCHING

#### PACKAGE DIMENSIONS (Unit : mm)



1. Source
2. Gate
3. Drain

MARK : G18



(Diode in the figure is the parasitic diode.)

The 2SK1591, N-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 excellent switching characteristics and high drain to source voltage, it is suitable for applications requiring high voltage and high-speed.

#### FEATURES

- Directly driven by ICs having a 5 V power source.
- Not necessary to consider driving current because of its high input impedance.
- Has high voltage and high-speed switching characteristics.

#### 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.

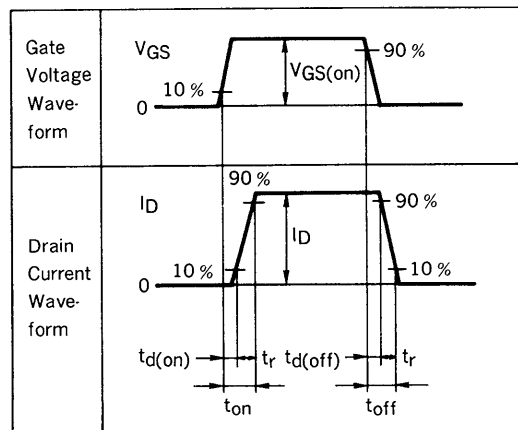
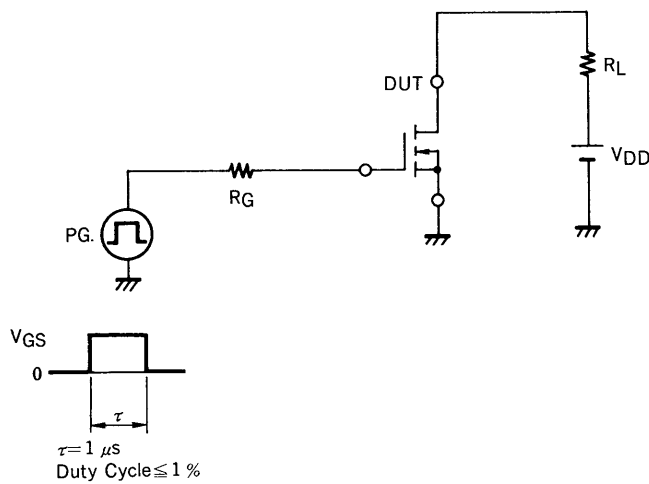
#### ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT	TEST CONDITIONS
Drain to Source Voltage	$V_{DS}$	100	V	$V_{GS} = 0$
Gate to Source Voltage	$V_{GS}$	$\pm 20$	V	$V_{DS} = 0$
Drain Current	$I_D(\text{DC})$	$\pm 200$	mA	
Drain Current	$I_D(\text{pulse})$	$\pm 400$	mA	$PW \leq 10 \text{ ms}$ , Duty Cycle $\leq 50 \%$
Total Power Dissipation	$P_T$	200	mW	
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

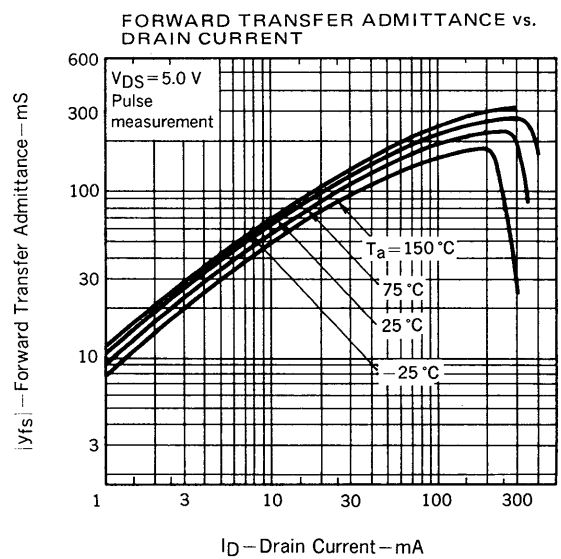
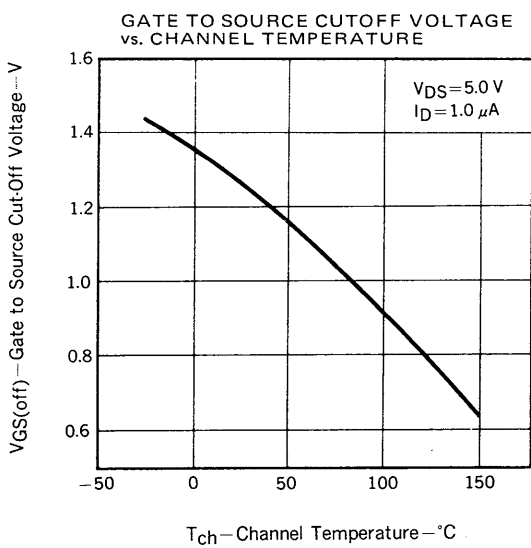
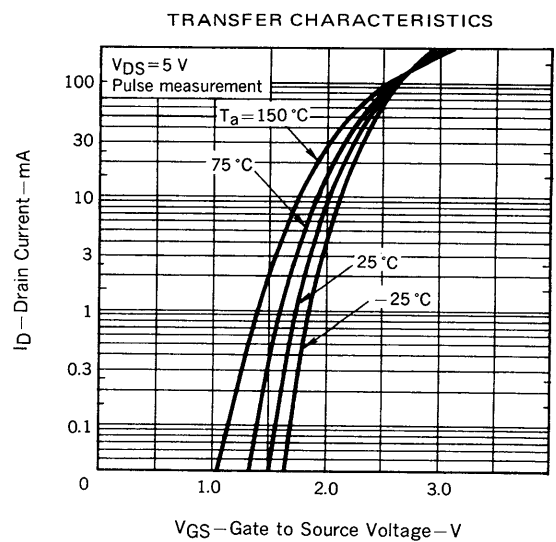
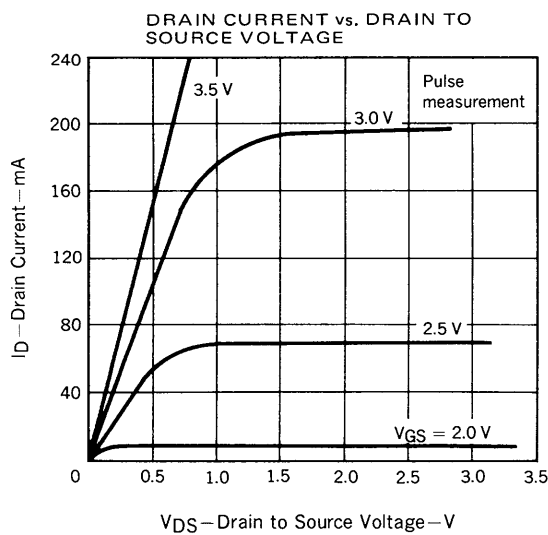
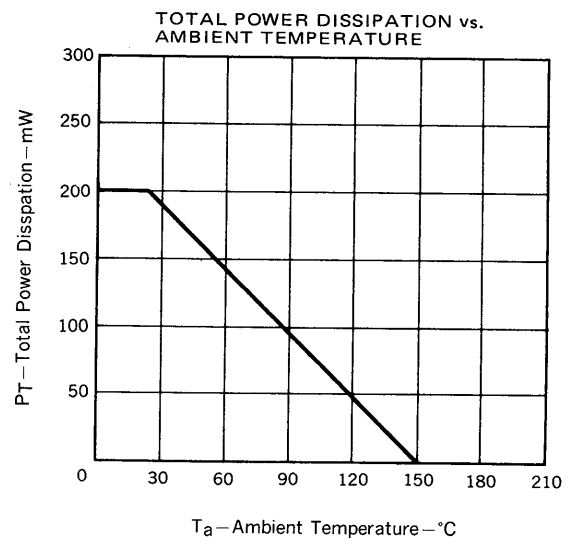
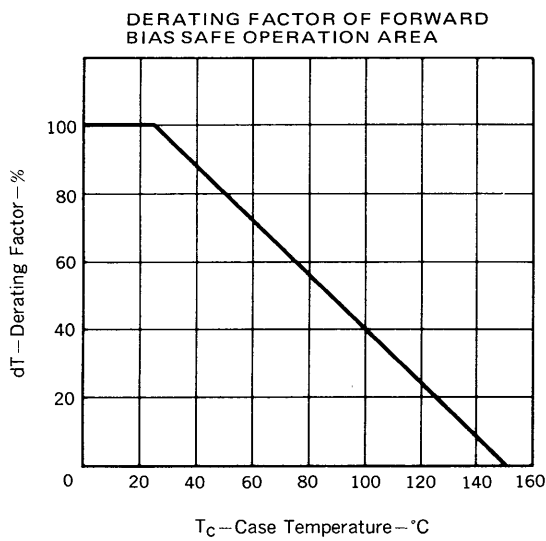
ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Cut-off Current	I <sub>DSS</sub>			1.0	μA	V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0
Gate Leakage Current	I <sub>GSS</sub>			±1.0	μA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0
Gate Cut-off Voltage	V <sub>GS(off)</sub>	0.8	1.3	1.8	V	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 1.0 μA
Forward Transfer Admittance	y <sub>fs</sub>	20	60		mS	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 10 mA
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>		5.8	8.0	Ω	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 10 mA
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>		4.8	6.5	Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 mA
Input Capacitance	C <sub>iss</sub>		25		pF	V <sub>DS</sub> = 5.0 V, V <sub>GS</sub> = 0, f = 1 MHz
Output Capacitance	C <sub>OSS</sub>		15		pF	
Feedback Capacitance	C <sub>rss</sub>		2		pF	
Turn-On Delay Time	t <sub>d(on)</sub>		60		ns	V <sub>GS(on)</sub> = 5.0 V, R <sub>G</sub> = 10 Ω V <sub>DD</sub> = 5.0 V, I <sub>D</sub> = 10 mA R <sub>L</sub> = 500 Ω
Rise Time	t <sub>r</sub>		100		ns	
Turn-Off Delay Time	t <sub>d(off)</sub>		180		ns	
Fall Time	t <sub>f</sub>		140		ns	

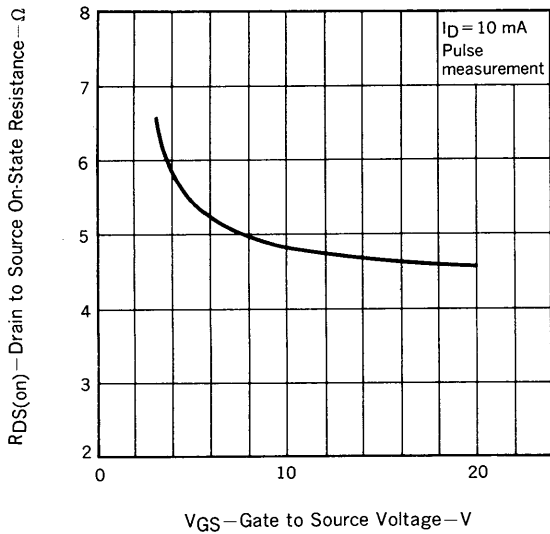
SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS



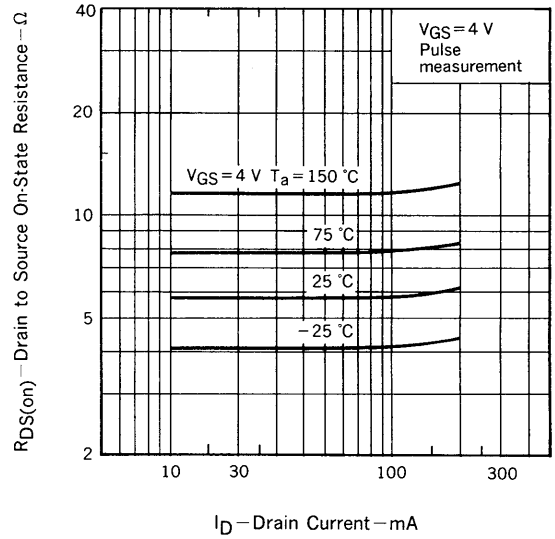
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



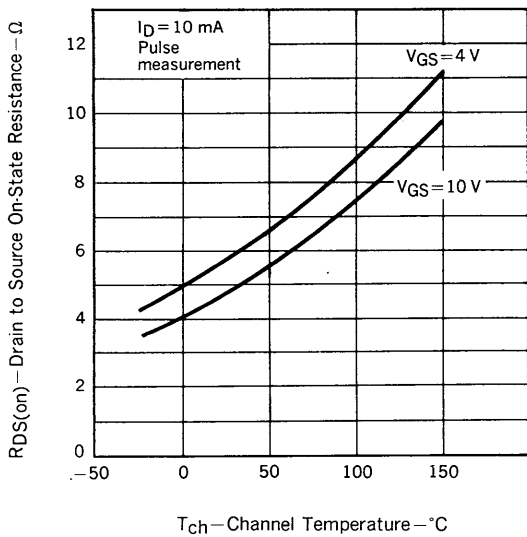
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



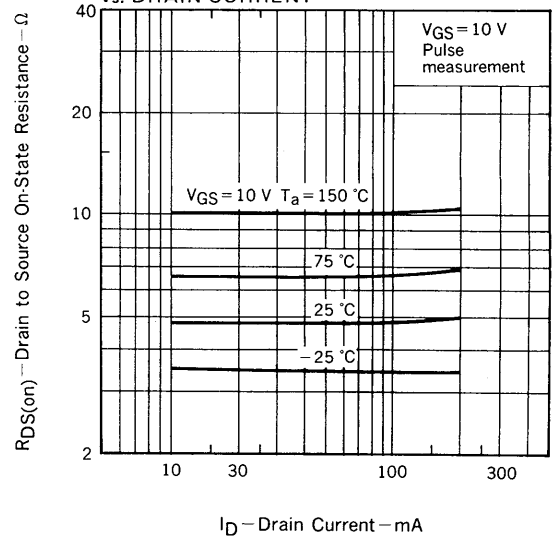
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



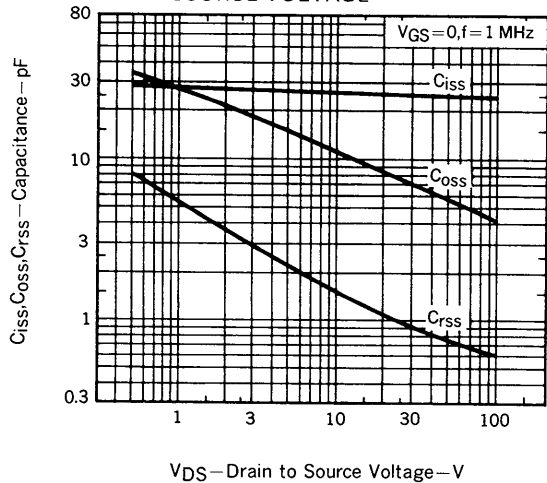
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



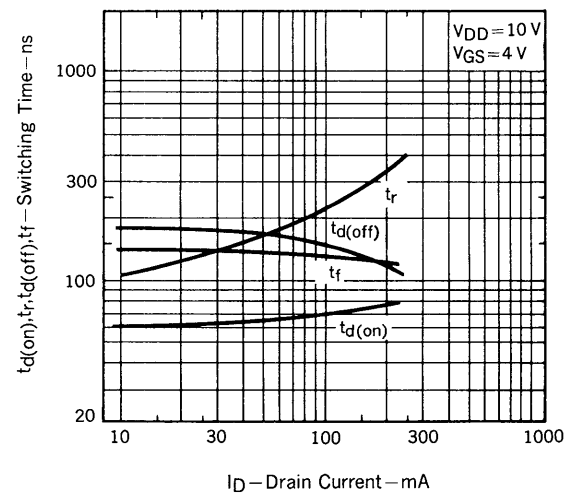
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT

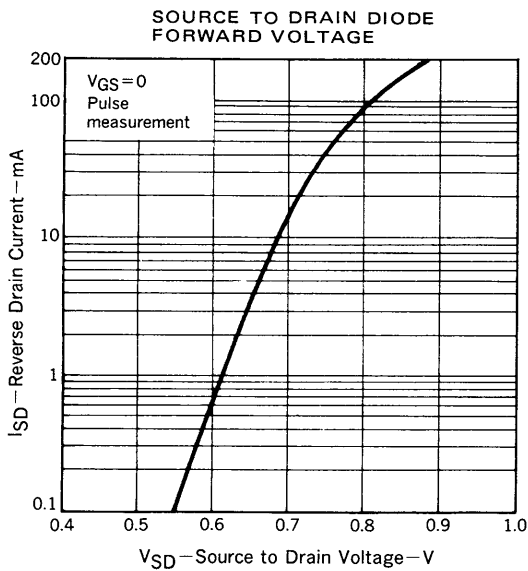


CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS





**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.: 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.

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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.



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